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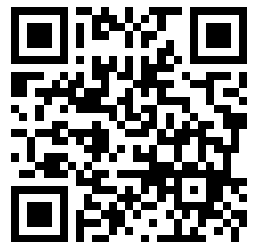
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The School World



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The School World

A MONTHLY MAGAZINE OF
EDUCATIONAL WORK AND PROGRESS

VOL IV.

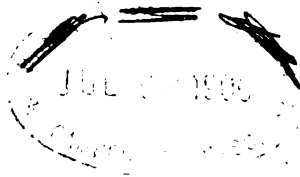
JANUARY TO DECEMBER, 1902

London

MACMILLAN AND CO., LIMITED

NEW YORK: THE MACMILLAN COMPANY

1902



The School World

A Monthly Magazine of Educational Work and Progress.

No. 37.

JANUARY, 1902.

SIXPENCE.

COMMON EXAMINATION ERRORS.

VI.—LATIN GRAMMAR.

By W. H. D. ROUSE, M.A.

THE mistakes which I propose to describe in this paper are taken from the answers to a public examination of three different years. The papers numbered some five or six thousand, done by both boys and girls, and came from all parts of England and the Colonies; it follows that they may be considered typical.

A general criticism may be offered, that nearly all the papers are badly set out. It is important, for many reasons, that answers should be orderly and neatly written, if only because confused arrangement goes so often with confused thought. Yet I must come to the conclusion that little attention is paid to this in most schools. Boys have the habit of looking upon the paper of questions, and then jotting down their answers wherever there may happen to be an empty space. If there is a list of phrases to be put into Latin, the English is generally written too, sometimes before the Latin and sometimes after it, each phrase as it may chance; where the English is not written, the Latin phrases which the boy knows are written down often without any hint if he has left anything out. The result is that, if the first phrase be omitted, all the others appear to render the wrong English. When only one or two are out of place, it is difficult for the examiner to know whether credit should be given for them or not. Pupils ought to be very carefully taught how to arrange their answers so as to be clear at the first glance. Not uncommon is a horrid distortion of orderliness by which two or three declensions are mixed up together. It is almost incredible, but it is true, that when asked to decline *par*, *felix*, and *acer*, quite a number will write something like this:—*par felix acer*, *param felicem acrem*, *parum felice acre*, and so on through the whole list.

It is also essential that they should be trained to understand the questions before writing the answers. The greatest number of mistakes are due to mistaking the questions; and comparatively few papers are quite free from this fault, which might be avoided if the pupil were taught to read

his paper over after it is written. Pupils will give the wrong thing: "comparative" when asked for "superlative," "infinitive" for "supine," "genitive" for "accusative," "gender" for "genitive," "singular" for "plural," or "plural" for "singular," "first" person for "third," and the forms given are more often than not quite right. Sometimes they give too much: all degrees of comparison when asked for one, a whole tense when asked for one person. Such answers are not correct, although they contain the correct answer. It sometimes happens that the form given in the question is actually written down for its own answer.

Latin words are very often indeed confused with French, or quasi-French, especially the numerals. *Vingt* is written for *viginti*, *soixante* for any decimal multiple of six, from sixty to six thousand, *cent* for *centum*. Sometimes this is done with simple nouns, as *filles* for *filii*.

Careless pronunciation of the teacher is the cause of the perennial mistake in the ordinals, by which a double *s* is written, as *vicessimus* for *vicesimus*. This is one of many blunders which would not occur under the reformed pronunciation of Latin. So too we find *triginter* for *triginta*.

But the worst feature of all the sets of papers I have ever examined is the parsing. A great many boys and girls have apparently never parsed a word: only so can I understand how they could be content to parse a verb by giving its principal parts, a noun with its genitive case and perhaps gender. Now parsing is not an interesting exercise, but it is generally recognised to be necessary; yet it is quite clear both that most teachers neglect it, and that those who do not have very hazy ideas as to what it means. It is strange that such bodies as the Headmasters' Conference do not agree upon some form of parsing to be adopted by all schools. More than one is possible. To take, for instance, *caperes*: it might be parsed in two simple ways, the one being the reverse of the other in order. Thus:—

(1) *Caperes*: 2nd sing. impf. subj. act. of a verb of the 3rd conj., *capio*, *capere*, *cepi*, *captum* (here follows subject, if it is taken out of a sentence).

(2) Verb, 3rd conj., *capio*, *capere*, *cepi*, *captum*, sbj. impf. sing., 2nd. (Subject as before.) Personally, I use the first, but it is a matter of taste.

For the other parts of speech we have, in this formula:—

Gregum. Gen. pl. masc. of a noun of the 3rd decl., *grex*, *gregis* (governed by—).

Quaesitus. Nom. sing., masc. of the pf. part. pass. of a verb of the 3rd conj., *quaero*, *quaerere*, *quaesivi*, *quaesitum* (agreeing with—).

Bene. Adv. of manner, pos. degree (modifying . . .).

These formulae may be shortened still further, but need never be made longer.

Three kinds of mistakes are especially common.

(1) Some give too much, (2) some too little, and (3) some use a confused order.

(1) *Too much*. Here are some examples:—

Verbera comes from *verber*, *verberis*, it is the nominative plural, it is neuter.

Verbera: noun, m. pl., 3 decl., n.-v. or acc. case, from the noun *verber*, a word.

Caperes: V., 3rd irreg. act. sbj. imp. 2nd sing., *caperem*, *caperes*, *caperet*, *caperemur*, *caperetis*, *caperent*.

Lacesso. This is a verb, it comes from *lacesso* (etc.) of the third conjugation, and is the first person singular of the present tense and the indicative mood, active voice.

This error is commonest with girls; but all sorts and conditions of children are apt to insert the unnecessary words: number, case, voice, and so forth.

(2) *Too little*. Some pupils habitually omit to specify the voice in verbs, or the tense, or the number; others omit the gender of nouns, and the degree of adjectives. The mark of quantity in the infinitive of the second conjugation is nearly always omitted. Number of declension or conjugation is useful, but not indispensable, so that I leave it out of account here. Examples:—

Quaesitus. Perf. part. from verb *quaero*.

Quaesitus, from *quaero*, *quaerere*, *quaesivi*, *quaesitum*, part. pres.

Triverit. Verb, 3rd conj., from *trivo*, act., indic. fut. pf.

Caperes. Verb, from *capio*, *cepi*, *captum*, subj. mood.

Verbera=a word, from *verbera*, neuter gender plural, (*verberis*) genitive. (Here there is too much as well as too little.)

(3) *Confused order*. The pupil writes down an item just when it comes into his head: as

Caperes. Noun, fem. gender, *caperes*, *caperis* genitive. Other verbs in the same paper will be parsed in different order each time.

Besides these, the pupil not infrequently (4) writes sheer impossibilities. Thus he contradicts himself:

Quaesitus. Verb irreg. of 3rd conjugation, from *quaero*, *quaerere*, *quaesivi*, *quaesitum*, pass. voice, infin. mood, perfect participle.

Triverit. Vb., 3 sig. pf. subj. indic. act.

Gregum. Supine of *grego*, *gregare*, *gregui*, *gregitum*. Or he gives forms which would be impossible on his own supposition, as:

Verbere, from *verbum*, *verbi*.

Quaesitus, from *queaso* (&c.).

Caperes, from *capio*, *capire*, *capivi*, *capitum*, imperfect subjunctive, active voice, subj. mood, simple form.

Lastly (5), a word is sometimes parsed quite correctly, and then again incorrectly by guess, sometimes even in two forms.

I would also call attention to the prevalence of guessing. It would seem as though teachers encouraged pupils to guess what they do not know. Now, in a piece of translation, the meaning of a word can often be made out from the context, and reasoning of this sort is most valuable; but nothing can be worse than a sheer guess, and pupils should never be allowed to write down in a grammar paper what they do not know. I have known *par* declined *par*, *pra*, *prum*, or *partem*, *partis*; the plural of *bos* as *boxes*, *boxum*, *boxibus*, or *bi*, *bos*, *borum*, *bis*, or *bosses*, *bossum*, *bossibus*, or (since the Transvaal war only), *bores*, *borum*, *boribus*. When genders are asked, the majority of answers are rank guessing.

This is not an encouraging picture. My experience goes to prove that grammar is not made nearly so useful as it should be for teaching accuracy and neatness and for training the memory to be exact. The blame must, I fear, lie with the teachers; for it is generally the case that nearly all pupils from a given school show the same faults and the same merits. I have no doubt that the teachers generally do their best, only they often do not know how to teach. If schools could be inspected by men competent not only to criticise but to show how a thing ought to be done, there would be undoubtedly a great change for the better. But our teachers have never been trained; they have picked up their skill at haphazard, and if they want to learn how to teach, they do not know whom to ask for help.

NOTES ON ARITHMETICAL CALCULATIONS.

By JOHN ORCHARD, M.A. (Oxon.).

I.

THE object of these notes is to present in an easily accessible form certain hints on the shortening of calculations and some methods alternative to those usually set forth in text-books.

ADDITION AND SUBTRACTION.

It is essential in most Civil Service examinations that long and cross tots should be done quickly and correctly. Addition, after a fair amount of practice, seems to require no mental effort, and any suggestion of shortening the process (except, of course, by multiplication where it can be applied) seems to be out of the question. In the long run, however, certain mental fatigue may be avoided by attending to the following hints:—

Example:—	4287
	784
	345
	8848
	89
	<u>14353</u>

(i.) It is not necessary to use tongue as well as brain. Do not, therefore, say nine and eight are seventeen, and five are twenty-two, and four are twenty-six, and seven are thirty-three, but go through the same process mentally, as follows:— Nine, seventeen, twenty-two, twenty-six, thirty-three.

(ii.) If any number occurs more than once in a column make use of multiplication. Thus, in the second column, at a glance there are three eights and two other numbers, making together a fourth eight. The sum of the column is therefore 32, making 35 with the three carried from the first column.

(iii.) Group sets of numbers whose sum is ten; these are easily recognised and the addition of ten to a number is simplicity itself. Thus, in the third column, carrying three the process would run as follows:—3, 13 (8 + 2), 23 (7 + 3).

When adding two numbers one of which is a little less than a power of ten, the process is simplified as follows:—e.g., $893 + 997 = 890 + 1000 = 1890$, i.e., replace the number in question by the power of ten, and make a balancing reduction in the other number.

In the subtraction of decimals of many places from whole numbers it is advisable to remember that the process of carrying one and then subtracting from ten is equivalent to a subtraction from 9.

Thus subtract 8'4379246 from 9

$$\begin{array}{r} 9 \\ 8'4379246 \\ \hline .5620754 \end{array}$$

After saying six from ten leaves four, instead of carrying one to the four and subtracting from ten, subtract four from nine and so on. The result can then be written from left to right. The process

will be more easily seen if for 9 we write 8'9999999; the +1 over any digit indicating that 1 should be added to that digit.

$$\begin{array}{r} \text{Thus } 8'9999999 \\ 8'4379246 \\ \hline .5620754 \end{array}$$

It is well to remember this when dealing with the logarithms of numbers less than unity where, though the logarithm is negative the mantissa is to be positive, the characteristic being a negative whole number. Thus: $-.4879632 = \bar{1}.5120368$ and vice versa. Similarly negative whole numbers may be transformed into positive with a compensating negative power of ten: e.g., $-78963 = \bar{1}21037$. This is sometimes useful when finding the sum of a number of positive and negative numbers. All the negative numbers are transformed by the above method, and the sum is reduced to an addition.

$$\begin{aligned} \text{e.g. } & 5469 - 87 + 4278 - 8034 + 768 - 7 \\ & = 5469 + 113 + 4278 + \bar{1}966 + 768 + \bar{1}3 \\ & = 2387 \end{aligned}$$

The units with the negative sign over them are, of course, subtracted when finding the sum of the column in which they are situate.

MULTIPLICATION.

To find the product of two numbers of two or three digits in one line. Example: multiply 87 by 54.

	Units stage.	Tens stage.	Hundreds stage.
	8 7	8 7	8 7
87	↓	↘ ↙	↓
54	5 4	4	5 4
4698	8	98	4698
		[2 + 32 + 35 = 69]	[6 + 40 = 46]

First, to obtain the units, multiply units by units. $4 \times 7 = 28$. Put down the 8 and carry the 2 to the tens stage. The other tens are obtained by multiplying the units in one number by the tens in the other. Thus $2 + (4 \times 8) + (5 \times 7) = 69$. Put down the 9 and carry the 6 to the hundreds which are obtained by multiplying the tens digits together. $6 + (5 \times 8) = 46$. After a little practice the whole process can be done very rapidly. Example: multiply 256 by 394.

Units.	Tens.	Hundreds.	Thousands.	Tens of thousands.
256	2 5 6	2 5 6	2 5 6	256
394	↘ ↙	↘ ↙ ↘ ↙	↘ ↙	↘ ↙
	3 9 4	3 9 4	3 9 4	394
4	6 4	8 6 4	0 8 6 4	100864
	[2 + 20 + 54 = 76]	[7 + 8 + 45 + 18 = 78]	[7 + 18 + 15 = 40]	[4 + 6 = 10]

Here the process is similar. It is well to bear in mind the diagrams formed by the arrows. They are symmetrical, and are easily remembered. The units and tens are obtained in the same way as in the first example, but hundreds can be obtained both by multiplying tens digits together and by multiplying the hundreds digits in one number by the units digits in the other. Thousands are obtained by the product of the tens digits with the hundreds digits, and tens of thousands by the product of the two hundreds digits. The process can of course be continued to higher numbers, but it becomes rather complicated in such cases.

Certain cases of multiplication by numbers of special form call for notice.

(1) To multiply by a power of ten add as many noughts to the multiplicand as there are noughts in the multiplier.

(2) Since $5 = \frac{10}{2}$, $25 = \frac{100}{4}$ and $125 = \frac{1000}{8}$, to multiply by 5, 25 and 125 add one, two or three noughts, as the case may be, and divide by 2, 4 or 8.

(3) If the multiplier is a little less than a power of ten, e.g., $995 = 1000 - 5$, proceed as follows:—

$$\begin{aligned} 8976 \times 995 &= 8976 \times (1000 - 5) = 8976000 - 4(89760) \\ &= 8976000 \\ &\quad 49880 \\ \hline &= 8926120 \end{aligned}$$

So $79843 \times 9975 = 798430000 - \frac{1}{2}(7984300)$
 $= 798430000$
 $\underline{1996075}$
 796433925

(4) If the only digits in the multiplier are unity and one other, e.g., 45678×81 , the answer may be got by multiplication in one line, an addition being substituted for the multiplication by unity. Thus, multiply by the 8 at once after obtaining the units figure, and add to the product at every stage the next figure to the left of the one multiplied. The multiplication would read thus:—

$1 \times 8 = 8$ $8 \times 8 + 7 = 71$ $7 + 8 \times 7 + 6 = 69$ $6 + 8 \times 6 + 5 = 59$
 $5 + 8 \times 5 + 4 = 49$ $4 + 8 \times 4 = 36$ Ans. = 3699918.

If the multiplier had been 801, the digit two to the left would have been added, and so on.

(5) If in a multiplier certain consecutive digits are a multiple of one or more others, e.g., 1089.— $1089 = 12 \times 9$. Multiply in the ordinary way by 9, and then multiply the 9 line by 120, thus:—

4863	Another example	5678
<u>1089</u>		<u>9541</u>
43767		51102
<u>5252040</u>		<u>306612</u>
		5678
<u>5295807</u>		<u>54173798</u>

In the second example the multiplication has been done in the reverse order so as to make use of the fact that $54 = 6 \times 9$.

When very large numbers have to be multiplied together there are two methods by means of which the drudgery of much multiplication may be avoided.

I. The method of "doubling and halving."—This process depends on the substitution of 2, 1 or $\frac{1}{2}$ for the digits in the multiplier by means of the following table:—

$3 = 2 + 1$ or $\frac{1}{2}(10) - 2$	$7 = \frac{1}{2}(10) + 2$
$4 = 2 + 2$ or $\frac{1}{2}(10) - 1$	$8 = 10 - 2$
$5 = \frac{1}{2}(10)$	$9 = 10 - 1$
$6 = \frac{1}{2}(10) + 1$	

When this has been done the only multiplication necessary is to find twice, and a half the multiplicand, and it is advisable to write these down at once. Two examples are worked out:

(i.) Multiply 3467895 by 609518.

Stage I.	Stage II.
$609518 = 101012$	$= \frac{1}{2}11\frac{1}{2}022$
$\frac{1}{2} \quad 1 \quad \frac{1}{2} \quad 1$	

The numbers in each place in Stage I. together with those directly on the left and beneath are the equivalent of the digits in the corresponding places in the multiplier.

$2 \times 3467895 = 6935790$
 $\frac{1}{2} \times 3467895 = 1733947.5$

The $\frac{1}{2}$ in the millions place of the multiplier	=	1,733,947,500,000
" 1 " 100,000's "	=	346,789,500,000
" 1 " 10,000's "	=	34,678,950,000
" 2 " 10's "	=	69,357,900

Positive part = 2,115,485,307,900

The $\frac{1}{2}$ in the 1000's place of the multiplier = 1,733,947,500
 " 2 " units " " = 6,935,790
 Negative part = 1,740,883,290
 Ans. = 2,113,744,424,610

(ii.) Multiply 28974632 by 4378965.

$4378965 = \bar{1} \bar{2} \bar{3} \bar{2} \bar{1} \bar{1} \bar{0} = \frac{1}{2} \frac{1}{2} \bar{1} \bar{2} \bar{1} \frac{1}{2} \bar{1} \bar{0}$
 $\frac{1}{2} \frac{1}{2} 1 1 1 \frac{1}{2} \frac{1}{2}$

$2 \times 28974632 = 57949264$
 $\frac{1}{2} \times 28974632 = 14487316$

$\frac{1}{2}$ in 10,000,000's place	=	144,873,160,000,000
1 in tens "	=	289,746,320
$\frac{1}{2}$ in " "	=	144,873,160
Positive part	=	<u>144,873,594,619,480</u>
$\frac{1}{2}$ in 1,000,000's place	=	14,487,316,000,000
1 in 100,000's "	=	2,897,463,200,000
2 in 10,000's "	=	579,492,640,000
1 in 1,000's "	=	28,974,632,000
$\frac{1}{2}$ in 100's "	=	1,448,731,600
Negative part	=	17,994,695,203,600
Ans.	=	<u>126,878,899,415,880</u>

II. The method of "doubling."—Here the device is such as to insure multiplying by 2 only. The essential point is to substitute 1, 2, 4, 8, 16, &c., for the digits of the multiplier. Using the same examples as above, we have—

(i.) 3467895×609518
 $609518 = 408118$
 2 14

Use the ones first, then the twos, fours, and so on; each step can be easily obtained from the preceding one.

1,000 times the multiplicand	=	3,467,895,000
100 " "	=	346,789,500
10 " "	=	34,678,950
200,000 " "	=	693,579,000,000
400,000 " "	=	1,387,158,000,000
400 " "	=	1,387,158,000
8,000 " "	=	27,743,160,000
8 " "	=	27,743,160
		<u>2,113,744,424,610</u>

(ii.) $28,974,632 \times 4,378,965$

$4,378,965 = 4 \ 3 \ \bar{3} \ \bar{2} \ \bar{1} \ \bar{4} \ \bar{1} = 4, \ 4 \ \bar{2} \ \bar{1}, \ 0 \ \bar{4} \ \bar{1}$
 $\quad \quad \quad 1 \ 1 \ 1 \ 1 \ 4$

1 times multiplicand	=	28,974,632
4 " "	=	115,898,528
400,000 " "	=	11,589,852,800,000
4,000,00 " "	=	115,898,528,000,000
Positive part	=	<u>127,488,525,673,160</u>
1000 times multiplicand	=	28,974,632,000
20000 " "	=	579,492,640,000
40 " "	=	1,158,985,280
Negative part	=	609,626,257,280
Ans.	=	<u>126,878,899,415,880</u>

A MODERN-LANGUAGE MASTER'S
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By OTTO SIEPMANN.

Head of the Modern-Language Department at Clifton College.

German.

IN a previous article which appeared in this Magazine (March, 1901), I have laid stress on the necessity that a young modern-language master who wishes to equip himself for his difficult task must, in the first place, try to acquire a good pronunciation. It is sometimes thought that it is much easier for an Englishman to learn to pronounce German correctly than French; and, in consequence, students and teachers do not take the same amount of trouble in trying to master the sounds of German, and are satisfied with a lower standard of correctness. This is a grave mistake. Even if it were true that German sounds come more naturally to the English organs of speech, there can be no doubt that the difficulties of a really good German pronunciation are so great as to make the study of phonetics indispensable. It is a delusion and a snare to believe that a short stay in Germany will be sufficient to set things right in matters of pronunciation. My advice to young modern-language masters is to study carefully one of the books on general phonetics, and of French and German in particular, which I have mentioned in my last article, and add to this Vietor's excellent little treatise, entitled "GERMAN PRONUNCIATION, PRACTICE, AND THEORY," 2nd edition (Leipzig, 1899, 2s.), and Georg Hempf's "German Orthography and Phonology" (Strassburg, Trübner). After these, Bremer's "Deutsche Phonetik" (Leipzig, 1893, 5s.) will be found interesting and stimulating. It goes without saying that a few hours' help from a native with a keen ear for sound differences and a good knowledge of phonetics will be found invaluable at the initial stages; but it may be pointed out that a German with an untrained ear and no acquaintance of phonetics will in all probability be found of little use; in fact, it is not impossible that his observations may prove positively misleading, for as a rule the statements of such natives about their own pronunciation and manner of producing speech-sounds are most untrustworthy, and when they proceed to correct the pronunciation of a foreigner their criticism and advice are as a rule of a most deplorable kind. If a thoroughly competent native cannot be found, the student should try to obtain the help of an Englishman who knows German and phonetics. Along with the study of phonetics and its practical application, which may quite well be carried on in one's study, the mastery of grammar and wide and deep reading are considerable aids for future proficiency as a teacher. Assuming that one of the ordinary school-grammars, such as those by Eve, Aue, Meissner, Weisse, Kuno Meyer or Whitney, is in the teacher's possession, he might with advantage take in hand

"A GRAMMAR OF THE GERMAN LANGUAGE," by H. C. G. Brandt (Boston, Allyn & Bacon, about 4s. 6d.), and study along with it Heyse's "Deutsche Grammatik oder Lehrbuch der deutschen Sprache," 25th edition, by Dr. Otto Lyon (Leipzig, 1893, about 4s.), or "Handbuch der deutschen Sprache," von Karl F. Becker, 11th ed. (Prag, 1876, about 5s.), which should be supplemented by a little work entitled "SATZBAU UND WORTFOLGE IN DER DEUTSCHEN SPRACHE," VON PROF. DR. DANIEL SANDERS (Berlin, 1883, about 2s. 6d.). A more scientific work on the same subject is "Der deutsche Satzbau," dargestellt von Hermann Wunderlich (Stuttgart, 1892, 252 pages), of which a very much enlarged second edition is appearing in two vols.; vol. i., 9s. unbound.

The most complete work on modern German grammar I know is the "Neuhochdeutsche Grammatik mit Berücksichtigung der historischen Entwicklung der deutschen Sprache," von Friedrich Blatz, 3rd edition (Karlsruhe, 1895, vol. i., 856 pp., 10s.; vol. ii., 1,314 pp., 15s.). With these works, a taste for the historical treatment of the German language is sure to develop, and BEHAGHEL, DIE DEUTSCHE SPRACHE (Leipzig, 1887, 1s.) may be recommended as a guide for beginners. Of this there exists a good English translation by Trechmann (London, Macmillan).

Wasserzieher's booklet "Aus dem Leben der deutschen Sprache" (Leipzig, 64 pp., stitched, for 4d.) is very small, but the student who buys it certainly gets his money's worth. Before mentioning any of the larger historical works, I must not omit two books which are excellent food for those who like to leave the beaten track and to think for themselves; they are Kern's "Deutsche Satzlehre" (Berlin, 1888, 184 pp.) and Ries' "Was ist Syntax?" (Marburg, 1894, 163 pp.). A study of these cannot fail to arouse the teacher's argumentative faculties, and he will be quite prepared to enjoy some other books of a critical description written by men who are dissatisfied with much that is used in present-day German, and aim at reform. "Allerhand Sprachdummheiten—Kleine deutsche Grammatik des Zweifelhaften, des Falschen und Hüsslichen—Ein Hilfsbuch für alle, die sich öffentlich der deutschen Sprache bedienen" von Dr. Gustav Wustmann (Leipzig, 1891, 320 pp., 2s.)—is a worthy lead off in this group of interesting publications. Erbe's "Randbemerkungen" (Stuttgart, 1892, 50 pp., 6d.), Minor's "Allerhand Sprachgrobheiten" (10d.) and a host of other "Streitschriften" followed in its train. Another book, "Sprachleben und Sprachschüden," by Matthias, though not directly connected with the polemic raging round Wustmann's excellent little work, should be read by every teacher of German, and in conjunction with it Lehmann's "Sprachliche Sünden der Gegenwart" (Braunschweig, 1882, 175 pp., about 2s.), Heintze's "Gut Deutsch" (Berlin, 1898, 200 pp., about 2s.), Brunner's "Schlecht Deutsch" (Leipzig, 1895, 199 pp., about 2s.), and Schroeder's "Vom papiernen Stil" (Berlin, 1896, 102 pp., about 2s.). "Sprachgebrauch und Sprachrichtigkeit" von Andresen (8th ed., Leipzig, 1899, 430 pp., 5s.) is a standard work which needs no recommendation. A stimulating volume is Reichel's "Sprachpsychologische Studien." Vier Abhandlungen über Wortstellung und Betonung des Deutschen in der Gegenwart, Sparsamkeit, Begründung der Normalsprache (Halle, 1897, 337 pp.,

about 4s.). And most excellent is Sütterlin's new work "Die deutsche Sprache der Gegenwart (1900).

There are some works on composition and style of Modern German which are most suitable for teachers, of which I must mention a few:—"DER DEUTSCHE AUFSATZ," VON ERNST LAAS, 2nd ed. of Part I. (Berlin, 1877); 3rd ed. of Part II., by Imelmann (Berlin, 1894, price about 10s.); "Der deutsche Stil von R. F. Becker, Neubearbeiter," von Dr. Otto Lyon, 3rd ed. (Leipzig, 1884, about 6s.); Sanders' "Deutsches Stil Musterbuch" (Berlin, 1886, about 5s.); "DIE SPRICHWÖRTLICHEN REDENSARTEN VON BORCHARDT," in gänzlicher Umarbeitung, herausgegeben von Gustav Wustmann, 5th ed. (Leipzig, 1895, about 6s.); and "Der Bilderschmuck der deutschen Sprache in tausenden volkstümlicher Redensarten," nach Ursprung und Bedeutung erklärt von Dr. Hermann Schröder, 5th ed. (Weimar, 1896, about 6s.). I would also advise every master or mistress of German to become a member of "Der Allgemeine Deutsche Sprachverein," which publishes a *Zeitschrift*, with valuable articles for teachers, and also "Wissenschaftliche Beihefte," with excellent contributions by eminent authors.

With "Unsere Muttersprache, ihr Werden und ihr Wesen," von Prof. Dr. O. Weise (Leipzig, 2nd ed., 1896, 270 pages, about 3s. 6d.) we enter again upon the historical platform, which may induce teachers to embark on the study of some of the greatest works, such as Von der Gabelentz' "Die Sprachwissenschaft" (14s.), Wundt's "Völkerpsychologie," I. Sprache (14s.) [which should be supplemented by Delbrück's "Grundfragen der Sprachforschung" (1901, 4s.)], or at any rate, of Whitney's "Life and Growth of Language" (6s.), and the interest taken in these philosophical works will most probably whet the appetite for a more thorough study of historical grammar, for which Cerf's "Short Historical Grammar of the German Language" (Williams & Norgate, 1894, Part I., Introduction and Phonology), and PROF. JOSEPH WRIGHT'S "GOTHIC, OLD AND MIDDLE HIGH GERMAN PRIMERS" will be found excellent helps and, at the same time, a good introduction to the study of the "Deutsche Grammatik (Gotisch, Alt-, Mittel-, und Neuhochdeutsche)," von W. Wilmann's Erste Abteilung—Lautlehre (Strassburg, 1893, 332 pages, about 6s.), Zweite Abteilung—Wortbildung (Strassburg, 1896, 663 pages, about 10s.), as well as to Erdmann-Mensing's "Grundzüge der deutschen Syntax."

The most excellent books on individual dialects for advanced students are found in Braune's "Sammlung kurzer Grammatiken Germanischer Dialekte" (Halle, Max Niemeyer). Braune's "Gotische Grammatik" (Halle, 1882, 2 aufl., 129 pp., about 3s. 6d.) might be preceded by Sheitberg's "Gotisches Elementarbuch (3s. 6d.), Braune's "Althochdeutsche Grammatik" (Halle, 2nd. ed., 5s. 6d.), Paul's "Mittelhochdeutsche Grammatik" (Halle, 1884, about 3s. 6d.). Braune's "Althoch-

deutsches Lesebuch" (Halle, 1881, 2nd. ed., 3s. 6d.) are the most reliable works on the older dialects.

Bachmann, "Mittelhochdeutsches Lesebuch mit Grammatik und Wörterbuch" (Zürich, 1892, about 5s.) is a suitable book for teachers who have not sufficient time to study the older portions of the German language and literature fully. There are several other first-rate books which form good introductions; such are Heiderich, "Einführung in das Studium des Gotischen" (1s. 3d.), for beginners, then "Zupitza," "Einführung in das Studium des Mittelhochdeutschen zum Selbstunterricht für jeden Gebildeten," 5th ed., by Nobiling (Oppeln, about 3s. 6d.), also Michels, "Mittelhochdeutsches Elementarbuch," in "Sammlung von Elementarbüchern der altgermanischen Dialekte Herausgegeben von Dr. W. Streitberg" (Heidelberg, 5s.). For the transition from Middle High German to Modern High German the following will be of good service: Arndt, "Der Übergang vom Mittelhochdeutschen zum Neuhochdeutschen der Breslauer Kanzlei" (5s.), Rückert, "Geschichte der neubochdeutschen Schriftsprache," 2 vols., 7s. each, and von Bahder, "Grundlagen des neuhochdeutschen Lautsystems." Teachers who have no wish to study the older dialects I would strongly urge to take up at least the following 10d. editions of the "Sammlung Göschen":—"Gotische Sprachdenkmäler übersetzt und erläutert; Althochdeutsche Literatur mit Grammatik, Übersetzung und Erläuterung";—Hartmann von Aue, Wolfram von Eschenbach und Gotfried von Strassburg;—Waltharilied—Walther von der Vogelweide, Minnesang und Spruchdichtung—Der Nibelunge Nôt—Kudrun und Dietrichpepen—and Sebastian Brant, Hans Sachs, Luther, Fischart.

Others may wish to go further afield to Paul's "Alteutsche Textbibliothek": (1) "Die Gedichte Walthers von der Vogelweide," hrg. von Paul, 1882, 1s. 10d. (2) "Gregorius von Hartmann" von Aue, hrg. von Paul, 1882, 1s. (3) "Der arme Heinrich" von Hartmann, von Aue, von Paul, 1882, 6d. (4) "Heliand," hrg. von Behagel, 1882, 2s. 6d. (5) "Kudrun," hrg. von B. Symons, 1883, 2s. 10d., and others, or to editions of the great masterpieces of the older German literature. I would mention "Wolfram von Eschenbach, Fünfte Ausgabe," von Karl Lachmann, Berlin, 1891, 640 pp.; Iwein, "Eine Erzählung von Hartmann, von Aue, mit Anmerkungen," von G. F. Benecke und K. Lachmann, zweite Ausgabe (Berlin, 1843, 565 pp.); "Der Nibelunge Nôt, mit den Abweichungen von der Nibelunge Liet, den Lesarten sämtlicher Handschriften und einem Wörterbuch," herausgegeben von Karl Bartsch (I. teil text, Leipzig, 1870, 394 pp.; II. teil, Erste Hälfte, Lesarten, Leipzig, 1876, 292 pp.; II. teil, Zweite Hälfte Wörterbuch, Leipzig, 1880, 411 pp.); "Kudrun," herausgegeben und erklärt, von Ernst Martin (Halle, 1872, 336 pp.); "Walther von der Vogelweide, by Wilmanns (2nd. ed., Halle, 1883) in Zacher's "Germanistische Handbibliothek." Wilmanns has also published "Leben und Dichtungen Walther's," von der Vogelweide (Bonn, 1882). For the sixteenth and seventeenth centuries I would recommend the "Liederbuch aus dem sechzehnten Jahrhundert von Goedeke und Tittmann (2nd. ed., Leipzig, 1881, 400 pp., 3s. 6d.), and the same authors' "Deutsche Dichter des sechzehnten und siebzehnten Jahrhunderts mit Einleitung und Anmerkungen" (each volume 3s. 6d.). Then for the eighteenth century Seuffert's excellent collection of "Deutsche Literaturdenkmale des 18 Jahrhunderts."

The editions of the great classical writers, Klopstock, Wieland, Lessing, Herder, Goethe, Schiller, Grillparzer, Heine, are so numerous that it is difficult to make a selection, and most teachers will not be able to purchase and work through the complete works of even the greatest writers. How-

¹ The annual subscription is 5s. Intending members should write to the President of the London Branch, Professor Weiss, Royal Military Academy, Woolwich, or the Secretary, Dr. Hirsch, 102, Embledon Road, Lewisham, London, S.E.

ever, they should use their influence that the best editions of the most eminent representatives of German literature are procured for their school libraries, such as the scholarly works of Old and Middle High German mentioned above, and then some, at least, of the following:—Luther's Werke, "Kritische Gesamtausgabe" (Weimar), Lessing's "Sämtliche Schriften herausgegeben von Karl Lachmann," 3rd edition, by Franz Muncker (Stuttgart, since 1886); Herder's "Sämtliche Werke herausgegeben," von Bernhard Suphan; "Goethe's Werke herausgegeben im Auftrage der Grossherzogin Sophie von Sachsen," the so-called Weimar edition; Schiller's "Sämtliche Schriften herausgegeben von Karl Goedeke"; Heine's Werke von Dr. E. Elster; Grillparzer's Sämtliche Werke, 20 vols., herausgegeben und mit Einleitungen versehen von August Sauer. The latter edition forms part of the "COTTA'SCHE BIBLIOTHEK DER WELTLITERATUR," in which most of the other classics have also appeared. They are very convenient editions for teachers, and can be bought separately, each volume bound in cloth, for 1s. Or cheaper still are the paper-cover editions of "RECLAM'S UNIVERSAL-BIBLIOTHEK," which cost 3d. each. Along with any of these should be used Düntzer's "Erläuterungen zu den deutschen Klassikern" (Leipzig, about 1s. each). Students of German who find it more convenient to use editions with English notes cannot do better than take up Breul's editions of some of the German classics for the Pitt Press, and Buchheim's editions for the Clarendon Press. I may also mention Rippmann's edition of Grillparzer's "Sappho," and Cotteril's edition of "Iphigenie" in my own series; and there are many excellent editions in Macmillan's German Classics, edited by Fassnacht, among them GOETHE'S "FAUST," Part I. Teachers who wish to study this great work thoroughly should take the edition by Colvin Thomas (Boston, Heath & Co.), which is most scholarly, and covers both the first and second part, as does Prof. Schröer's edition of "Faust," Part I., 5s.; Part II., 6s. 6d.

Some of the editions mentioned contain biographies of the great writers, but they are necessarily short and sketchy. Those who wish to study the lives of the great German classics more deeply I would refer to Erich Schmidt's "Lessing, Geschichte seines Lebens und seiner Schriften" (Berlin, 1884, 2 vols.), Bielschowsky's "Goethe," 2 vols., or Eugen Wolff's "Goethe's Leben und Werke," or R. M. Meyer's preisgekrönte Arbeit "Goethe" (628 pages), also Düntzer's "Goethe's Leben" 10s. should be mentioned, and perhaps Lewes' "Life of Goethe." Among the biographies of Schiller, Minor's "Schiller, sein Leben und seine Werke" (Berlin, Weidmann) takes the first place; Weltrich, Brahm and Düntzer have likewise furnished valuable contributions.

If I am to give some guidance to the more recent works of German literature I cannot do better, I think, than quote a few authors and works without wishing to say that there are not many others equally good. Take GUSTAV FREYTAG'S "AHNEN," SCHEFFEL'S "EKKEHARD" (Stuttgart, 1893), GOTTFRIED KELLER'S "ZÜRCHER NOVELLEN" (Ber-

lin, Hertz, 1896), C. F. MEYER'S "JÜRGENATSCH" (Leipzig, Haessel); Fontane, "Vor dem Sturm," Spielhagen's "Problematische Naturen," Paul Heyse's "Novellen," Otto Ludwig's "Heiterethei," Storm's "Immensee," ROSEGGER'S "SCHRIFTEN DES WALDSCHULMEISTERS," Wildenbruch's "Neue Novellen," SUDERMANN'S "FRAU SORGE," HAUPTMANN'S "VERSUNKENE GLOCKE," SCHEFFEL'S "TROMPETER VON SÄKKINGEN," Weber's "Dreizehnlinden," Heine's "Buch der Lieder," Buchheim's "Deutsche Lyrik" and Buchheim's "Balladen und Romanzen" (Macmillan); and read a few modern plays, such as WILDENBRUCH'S "HAROLD" and "König Heinrich," SUDERMANN'S "Johannes," "EHRE" or "HEIMAT," HAUPTMANN'S "WEBER" or "Einsame Menschen." These will give the reader an idea of the tendencies and struggles of modern German literature.

Turning to the history of the German language and literature, I would call special attention to the "*Histoire de la langue allemande*" par Henri Lichtenberger (Paris, 1895, 478 pages), which is likely to suit many teachers who prefer to read a book written in French. Among histories of literature I have so many good works before me on my shelves that the *embarras de richesse* which has been troubling me all along is taking a very acute form, and I hope readers of this article will forgive me if I call their attention to some works which they may very likely not think of purchasing. Let me begin with a book written in English, entitled "*Outlines of German Literature*," by Gostwyck and Harrison, of which, I think, a new revised edition by a competent German scholar will appear before very long (London, 1873, 10s.). Of Hermann Kluge's "Geschichte der deutschen National-Literatur" (Altenburg, 22nd ed., 1891, about 2s. 6d.), there is, I believe, also an English translation. Excellent little books are "Grundzüge der deutschen Litteraturgeschichte" von Dr. Gotthold Klee (Berlin, 3rd ed., 1898, about 3s.), and "*Grundzüge der deutschen Litteraturgeschichte von Dr. Gottlob Egelhaaf*" (Heilbronn, 6th ed., 1888, about 2s. 6d.). Larger works and more suitable for serious students are:—Wilhelm Scherer's "Geschichte der deutschen Litteratur" (Berlin, 8th ed., 12s.), of which there exists an English translation by Mrs. Conybeare. Koberstein's "Grundriss der Geschichte der deutschen Nationalliteratur," in 5 vols. (5th ed., 1892, by Karl Bartsch), is a most thorough work. An edition with many facsimiles and illustrations is König's "Deutsche Litteraturgeschichte," which costs about £1. A similar and in its text more scholarly work is the "Geschichte der deutschen Litteratur von den ältesten Zeiten bis zur Gegenwart" by Vogt and Koch (Leipzig, 1867, 16s.). A standard work for advanced students who wish to study the subject thoroughly is Karl Goedeke's "Grundriss zur Geschichte der deutschen Dichtung" (2nd edition, after the death of the author continued by E. Goetze). All that a teacher may require by way of a history of the German literature of the older period is contained in "*Paul's Grundriss der Germanischen Philologie*," of which a second edition is appearing, and without which no serious student of German can exist. For the eighteenth and nineteenth centuries a few special works will be necessary. For the eighteenth century Hermann Hettner's "Geschichte der deutschen Litteratur im XVIIIten Jahrhundert" (2 vols., 4th edition, by Harnack) can be thoroughly recommended.

There is as yet no standard book dealing with the nineteenth century, but Rudolf von Gottschall "Die Deutsche Nationalliteratur des neunzehnten Jahrhunderts" (6th ed., 4 vols, 1892), and

a smaller work, "Die deutsche Nationalliteratur von Goethe's Tode bis zur Gegenwart," by Adolf Stern (3rd ed., 1894), also the same author's "Studien zur Litteratur der Gegenwart" (Dresden, 1895, 449 pp.), and "Zur Literatur der Gegenwart Bilder und Studien" (Leipzig, 1880); further, "DIE DEUTSCHE DICHTUNG DER GEGENWART, DIE ALTEN UND DIE JUNGEN," VON ADOLF BARTELS (2nd ed., Leipzig, 1899, about 3s. 6d.), and "DAS DEUTSCHE DRAMA IN DEN LITTERARISCHEN BEWEGUNGEN DER GEGENWART," VON B. LITZMANN (4th ed., Leipzig, 1897, about 4s.), are works which ought to be studied. In conjunction with this I should like to call attention to GUSTAV FREYTAG'S "TECHNIK DES DRAMAS" (8th ed., Leipzig, 1898, 5s.), and Spielhagen's "Beiträge zur Theorie und Technik des Romans" (Leipzig, 1883).

As a primer for the study of German prosody I may mention the "LEHRBUCH DER POETIK FÜR HÖHERE SCHULEN," VON SCHUSTER (3rd ed., Halle, 1890, about 2s.), and for those who wish to pursue this subject Minor's "Neuhochdeutsche Metrik" (490 pp., 10s.) will supply all they may require. F. Kaufmann's "Deutsche Metrik nach ihrer geschichtlichen Entwicklung" (Marburg, 1897, 3s. 6d.) is good, and Sievers' "Altgermanische Metrik" (5s.) is the standard work for the older periods.

No teacher of Modern Languages can perform his duties efficiently unless he has made himself acquainted with the character, the customs, the institutions and the history of the country the language of which he proposes to teach. It is, therefore, necessary for every teacher of German to spend at least some time abroad and to study carefully works like Francke's "Social Forces in German Literature" (New York, 577 pp.) (a new edition of this work has been published by George Bell & Sons in London under the title of "A History of German Literature as determined by Social Forces"), FREYTAG'S "BILDER AUS DER DEUTSCHEN VERGANGENHEIT" (24th ed., Leipzig, 5 vols., about 6s. each), Heinrich von Sybel's great work "Die Begründung des deutschen Reiches durch Wilhelm I." (7 vols., 66s., Leipzig, 1889-1894), then "von Treitschke's Historische und politische Aufsätze" (3 vols., 8s. each), Bismarck's "Leben und Erinnerungen" (21s.), of which there is an English translation. To those who cannot study these great works, I would strongly recommend the following which contain a minimum of the knowledge absolutely necessary to any teacher:—SYDNEY WHITMAN, "IMPERIAL GERMANY" (London, 1891, about 2s. 6d.); "German Life in Town and Country," by W. H. Dawson (London, Newnes, 1901); SIME'S "HISTORY OF GERMANY" (London, 1898, about 2s. 6d.), Jentsch, "Grundbegriffe und Grundsätze der Volkswirtschaft" (Leipzig, 1895, about 3s.), Fünfzehn deutsche Volksbücher wiedererzählt," von Gustav Schwab (15th ed., by G. Klee, Leipzig, 1893, about 3s.), "DIE DEUTSCHEN HELDEN-SAGEN," VON GOTTHOLD KLEE (3rd ed., Gütersloh, 1889, about 3s. 6d.).

For German mythology there is, I think,

nothing better than Mogk's "Abriss" in Paul's "Grundriss," but I must mention two little booklets of the Sammlung Göschen for small purses, KAUFFMANN, "DEUTSCHE MYTHOLOGIE" (2nd ed., 10d.), and GÜNTHER, "DEUTSCHE KULTURGESCHICHTE" (10d.).

There is superfluity in excellent German dictionaries. To begin with small ones, WHITNEY'S "GERMAN AND ENGLISH DICTIONARY" (Macmillan, about 5s.) may be recommended, though it is not sufficient for an advanced student of German. FLÜGEL-SCHMIDT-TANGER is a most excellent work, and cheap at about 14s. for two vols. Of the larger works the new edition of GRIEB'S DICTIONARY, BY SCHRÖER, 26s., and the large Flügel at 36s., and Muret-Sanders, "Encyclopedic Dictionary," complete, about £4—there is a small and cheap edition of this at about 16s., in one volume, which is very good. It is not a mere extract of the larger work, but largely an original compilation by B. Klatt and H. Baumann, carefully done and thoroughly reliable, most suitable for upper forms and teachers. Among the "Wörterbücher" written in German, PAUL'S "DEUTSCHES WÖRTERBUCH" (576 pp., about 8s.), M. Heyne's "Deutsches Wörterbuch," in 3 vols (about 30s.), and KLUGE'S "ETYMOLOGISCHES WÖRTERBUCH" (about 10s.) are eminently suitable works. The new edition of the large Grimm which is in process of publication, as well as Grimm's "Deutsche Grammatik" in its new form, should be procured for the school library. Good supplements to any dictionary are EBERHARD'S "SYNONYMISCHES WÖRTERBUCH" (15th ed., Leipzig, 1896, 12s.), "WÖRTERBUCH DER HAUPTSCHWIERIGKEITEN IN DER DEUTSCHEN SPRACHE," VON SANDERS (19th ed., Berlin, 1889, about 3s.), and DUDEN'S "ORTHOGRAPHISCHES WÖRTERBUCH" (1s. 6d.).

In conclusion, I should like to recommend to all students of German philology the "*Jahresbericht über die Erscheinungen auf dem Gebiete der Germanischen Philologie*" (about 9s.), and let teachers of German subscribe to one or two of the many German periodicals which deal with pedagogical as well as philological and literary questions. *Die neueren Sprachen* (about 10s. p.a.) and the *Literaturblatt für germanische und romanische Philologie* (about 10s., p.a.) would be sufficient for ordinary purposes; those who make a special study of German will find the "*Zeitschrift für den deutschen Unterricht*," edited by Lyon, the "*Deutsche Literaturzeitung*," "*das Archiv für das Studium der neueren Sprachen und Literaturen*," Paul and Braune's "Beiträge zur Geschichte der deutschen Sprache und Litteratur," and Kluge's "*Zeitschrift für Deutsche Wortforschung*" (about 4 numbers per annum for 10s.), very useful.

Anyone wishing to obtain further bibliographical information on this large subject should refer to Breul's "Handy Bibliographical Guide" (London, 1895), to Prof. Rippmann's excellent lists in the *Modern Language Quarterly*, and with regard to French, to Brauholtz's "Books of Reference for Students and Teachers of French," and to Koschwitz-Jeffrey's "Guide to the Study of French" (London).

PRACTICAL BOTANY FOR CHILDREN.¹

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II.

STEM AND LEAVES.—There are two ways in which we may classify stems; either according to their structure or according to the way in which they grow. The differences between soft and short-lived stems and woody stems, belonging to plants which live many years, are quickly noted by children. The division into erect and climbing stems gives some useful practice in observation of the ways in which plants climb and in reasoning as to why it is advantageous to be a climber.

WAYS IN WHICH WEAK STEMS CLIMB.—(1) By scrambling over their surroundings; *examples*, ground ivy, brambles, strawberry.

(2) By hooks, which are often parts of leaves (clematis, nasturtium), or by roots (ivy).

(3) By twining. The same kind of plant almost always twines in the same direction (*exception*, bittersweet), and most plants twine to the left, *i.e.*, the opposite direction to the hands of a watch. Note examples of each: hop and honeysuckle to the right; bean and convolvulus to the left.

(4) By tendrils or other sensitive organs. *Examples*: passion flower, sweet pea, vine, virginia creeper. The tendrils are very sensitive, and if stroked delicately bend slowly towards the side touched.

The use of climbing is that the plants may reach the light and free air as easily as possible.

The surface and shape of different stems should be noted, whether smooth, hairy or prickly; cylindrical (grasses, trees), square (dead nettle), three sided (sedge), ribbed (hemlock), flattened (sweet pea). Smooth stems usually have a tough skin which protects them against insects, a purpose served in other cases by hairs (poppy), prickles and thorns, which also afford some protection against grazing animals.

LEAVES.—The children should be encouraged to make collections of fresh and skeleton leaves; the latter can be found abundantly in woods in late autumn, winter, and till early spring buried under fallen leaves. The descriptions at this stage need not be elaborate. The division of the leaf into leaf-stalk and blade is an easy one; the edges are seen to vary in different kinds of plants, and the names of the most common leaf-forms are soon learnt by reference to many specimens.

The great facts in connection with leaves are their work of feeding the plant, of getting rid of superfluous water, and of respiration. These can be made clear and interesting by experiments. The leaf is the most important part of the plant, and is always present except in the very rare cases when the stem is modified to do its work. The plant grows only while it has its leaves. If they are stripped off while green and vigorous it often dies although stem and root are left.

EXPERIMENTS.—(1) Grow a plant in the dark; its leaves are thin, yellow, or white, and it is sickly; on exposing it to sunshine the leaves turn green and grow, while the plant becomes sturdy and healthy.

(2) Weigh a plant at the beginning and end of the day for two days or more, letting it stand in sunshine; note changes and explain their cause.

(3) Keep a plant under a bell jar, cover the surface of the earth in the pot with tinfoil to prevent evaporation from it, and notice how the inside of the glass becomes covered with little drops of water.

(4) Put the stalk of a primrose leaf into the mouth and the blade into water. Blow through the cut end of the stalk; air passes out from the surface of the leaf into the water, showing there are little openings by which air or water vapour can pass out of the plant.

(5) If the children have some knowledge of general elementary science, they may be allowed to collect the gas given off by water plants and test it for oxygen; and that given off by seedlings in a corked bottle for carbonic-acid gas.

MOVEMENTS OF LEAVES.—The stem and leaves grow towards the light. This is easily seen in plants grown near a window; they bend towards the direction of the light.

The leaflets of clover and wood-sorrel show by their change of position at night the "sleep" of plants. They fold downwards after sunset. Other plants in which this can be seen are mimosa, lupins and beans. If the plants are not exposed to bright sunshine during the day they do not sleep at night. The closing of flowers at night is also called sleep, but it is probably due to a difference of temperature, not of illumination, and protects the inner parts of the flower from cold and wet. In very cold weather the leaves of laurels and other evergreens will be noticed to turn downwards close to the main stem, which protects them from the chill of excessive radiation which would take place if they were in a horizontal position in frosty weather. This is probably the advantage which all plants derive from their sleeping position, "the protection of their upper surfaces from radiation into the open sky." Leaves are protected against general cold and wet sometimes by coatings of woolly hairs (edelweiss, cudweed), against animals by prickles (holly, rose); in very dry places the leaves have thick skins often covered with wax (which also forms the "bloom" on fruit) to prevent much loss of water from the surface. The effect of a similar covering in keeping the leaf fresh can be shown by covering a large leaf with vaseline and comparing in a few hours with one not so covered. Trees and shrubs prepare for the winter by cutting off the leaf stalks from the branches by a cushion of cork; thus the scar of the leaf is prepared before it falls off and the supply of water stopped at the same time. The prepared leaf-scars are very clearly seen in the horse-chestnut, in which they are horse-shoe shaped. Next year's leaves are prepared in the form of buds, which should be collected and examined carefully by the class at

¹ Concluded from November, 1901.

intervals from autumn to spring. They are always protected by tough coverings, hairy coats, or varnished with resin (examples, elm, willow, chestnut).

FLOWERS.—The parts of the flower should be studied at first without dissection; later, the flowers may be taken to pieces carefully and the parts pinned out. The following will serve as useful types: buttercup, sweet pea, primrose, tulip, hyacinth, jonquil, crocus. Many bulbs planted in autumn can be easily grown in a schoolroom, under the care of the class: snowdrop, hyacinth, daffodil, narcissus, tulip. If a garden bed is available it will be found a never-failing source of interest and pleasure; window boxes are a good substitute if the garden is not attainable.

In studying flowers and the uses of their parts much may be done by observation out of school. The bright colour and strong scent attract insects to visit flowers; the solid advantages they take away in the honey and pollen for food. The service rendered in return is the conveyance of pollen from one plant to another of the same kind. Noting these things leads to the understanding of pollination and the simpler methods by which it is effected. Some plants are pollinated by creeping and short-tongued insects (buttercup, arum, hemlock); some flowers (pea, vetch, clover) are specially adapted for bees, as the honey is concealed and bees have long tongues; the monkshood and foxglove are visited by humble-bees; pinks and honeysuckles by butterflies and moths. Trees, as hazels and poplars, have inconspicuously coloured flowers, but the flowers come before the leaves and in breezy spring so that the pollen is distributed by the wind. Grasses are another common instance of wind pollination.

FRUITS.—A collection of dry fruits should be made throughout the year. Many edible fruits can be bought at any time. In spring the fruits of the primrose and marsh marigold are to be found; in summer those of the buttercup, violet, poppy, and dandelion; and in autumn a countless number of specimens are available, such as nuts of all kinds; clematis, rose-hips, haws, peas, beans, wall-flowers, &c.

The chief points to be noted by young children are the division into classes of superior and inferior fruits—shown by reference to the orange and apple; the other great division into fruits which open, and fruits whose outer covering rots away or is broken artificially before the seed can come out. A large number of different fruits should be compared and the identity of parts noted under diversity of appearance.

The ways in which fruits open and seeds are dispersed give scope for careful observation. Good examples are seen in the poppy, iris, violet, honesty, pea, and many others.

The dispersal of fruits and seeds by the wind is well shown in elm, maple, thistle, dandelion, and clematis; other fruits and seeds have rough, clinging surfaces, so that they are carried by animals. *Examples:* goose-grass or cleavers; "burrs" or burdock. Seeds carried by birds or other animals have generally attractive outside

coverings, and the seed being hard is undigested. *Examples:* yew and spindle, wood berries.

The other ways in which flowering plants multiply are chiefly by *off-shoots* from the stem. Examples are found in house-leeks, strawberries, couch grass. Artificial propagation by cutting shows also the reproductive power of the stem; begonias can be "struck" from a single leaf.

The above is a brief and general sketch of a plan of work which has been tried with success in a class of young children. Observations of what actually takes place in field and garden cannot fail to be a satisfactory foundation for future experimental work in laboratory botany. Young children have not the sufficiently mature minds to realise the significance of any but very simple experiments (such as have been described in this article), but they are keen and truthful students of outdoor sights and sounds, and faithful reproducers of what they see, especially if encouraged to illustrate their impressions by drawing and painting.

The children should keep a "Nature Calendar," in which they can enter each day any new observation they make about the seeds and plants which they are growing or watching elsewhere. The children should also be encouraged to collect fruits, seeds, flowers, leaves, &c., and to arrange their finds in an orderly manner. As much work as possible should be done out of doors. The main object of such a course in Practical Botany is to train the power of accurate observation and precision of expression, but perhaps the greatest good is in awaking and stimulating an enduring love of Nature.

ACETYLENE AS A LABORATORY HEATING AGENT.

By A. E. MUNBY, M.A.
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THE use of acetylene gas for lighting has extended so much during the last few years, and has proved such a boon to many who have no gas or electric light at disposal, that it is remarkable that more has not been done to produce suitable apparatus for using the gas for heating. In these days, when laboratories are springing up in so many small places where coal gas is either not obtainable or prohibitive in price, the possibilities in connection with this use of the gas are very great, and have only quite recently been utilised. The gas, containing as it does 92 per cent. of carbon, requires, of course, special arrangements for its successful combustion. Calcium carbide, which produces the gas on contact with water, is now so well known that it is perhaps unnecessary to say anything about its production. The sole makers in this country, the Acetylene Illuminating Company, share with the British Aluminium Company the energy derived from the Falls of Foyers for producing their carbide, and the office of the former Company is at 3,

Victoria Street, S.W. A good deal of carbide is made on the continent and varies considerably in quality, the make of some firms being undoubtedly good. A good carbide should yield on an average four and a half to five cubic feet of gas per pound, and can be obtained delivered in most places at the present time for about £21 per ton, and as it is now usually packed in free non-returnable drums, this represents the total cost.

The choice of a generator for acetylene is rather beyond the scope of this article, but the report of the Committee on the Exhibition of Acetylene Generators held at the Imperial Institute in 1898, and printed by Mr. Trounce, 10, Gough Square, Fleet Street, or the elaborate work of Professor Lewes entitled "Acetylene," contains many drawings and valuable details of a score or more of generators now on the market. Where space, money and a good water-supply are all available, we think that a non-automatic generator, in which the whole of the gas to be used for a given period is generated at once, is to be recommended, especially as the pressure required for heating work, which, it must be noted, is equal to six inches of water as against about three inches generally arranged for a generator for lighting only, is readily obtained. If an automatic generator be employed, it is advisable to ascertain beforehand that this pressure can be obtained, and it should be borne in mind, and if necessary impressed upon the makers, that this additional pressure tends to the formation of more "after gas," so that the storage capacity of the gas holders should be increased. As regards the estimation of the size of generator required, it will be found that some makers have a tendency to over-estimate the output of their apparatus, and it will sometimes be found desirable, therefore, to install a machine a size larger than appears to be actually necessary on paper. Among automatic generators we may recommend that of Messrs. Thorn and Hoddle, 135, Victoria Street, S.W., as being compact and moderate in price, and we believe with their latest improvements quite satisfactory. We believe this firm to have been the first to modify a generator for heating purposes, and that they are alive to the requirements of the additional pressure. We have not found, however, that their generators run very well coupled together when the installation requires more than one of the largest size, one having a tendency to pump into the other. However, the firm claim to have improved the method of balancing, and where a second machine is kept merely in reserve, this of course does not form any objection.

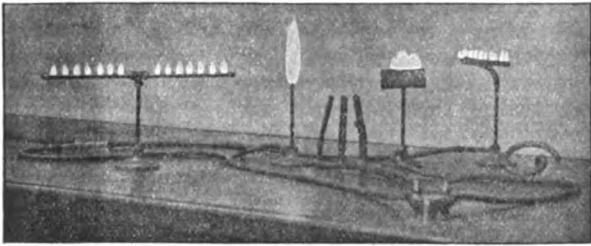
The gas produced from any generator is not quite pure, and although it is used at present more often than not without any purification, it is becoming recognised that such a course is undesirable. The most important impurities in the gas are phosphoretted hydrogen, ammonia and benzene; the two former may be attributed directly to the carbide, and although they will be very small in amount in the case of a good carbide, such as that from Foyers, their removal is very

desirable from a laboratory point of view, because they cause very rapid injury to platinum apparatus exposed to a Bunsen flame, and from an interesting paper in the *Chemical Society's Journal* for November, it would seem that the ammonia is probably not the lesser of the two offenders. The last-mentioned impurity, benzene, may be produced owing to over-heating in the generator by the polymerisation of the acetylene; the objection to it from the heating point of view is that it tends to produce a zone of luminosity in the Bunsen flame.

Various purifiers have been proposed having for their general object the oxidation of the phosphoretted hydrogen, the neutralisation of the ammonia and the absorption of the benzene. Among others, bleaching powder and an aqueous acetic-acid solution mixed with chromic acid may be mentioned. The gas should pass through, not merely over, the purifier employed, which may be effected by making a solution, or milk, of the purifier with water, and exposing a large surface to the action of the gas by impregnating some indifferent substance such as coke or pumice with the liquid. We have made one or two experiments with the object of finding the value of these two purifiers in removing the luminous zone from a Bunsen flame and decreasing the deteriorating effect of the gas on platinum. So far as such experiments have gone, they seem to show that both considerably decrease the action of the gas on platinum, but that the acetic-acid mixture is the more efficacious. On the other hand, the bleaching powder has a marked effect in reducing the tendency to luminosity in the flame, though this effect does not seem to be very lasting; the acetic-acid mixture, however, appears to have no effect in this direction.

The construction of the Bunsen burner for acetylene involves a consideration of the diameter of the tube, which must be very small, to prevent "striking back"; the aperture of the jet, which has only to deliver about a quarter as much gas per time as in an ordinary Bunsen burner; and the gas pressure, which must be high, in order that the injecting power may be sufficient to cause the complete combustion of the gas. These factors, of course, are intimately connected one with the other, and admit of very little latitude. In the Munby burner, as produced by Messrs. Gallenkamp and Co., of 19, Sun Street, Finsbury Square, E.C., the diameter of the tube used is five millimetres, and the jet is capable of delivering about one cubic foot of acetylene per hour under the pressure employed, which is equal to a head of six inches of water. This burner, which is described in the *Proceedings of the Chemical Society*, 1896, No. 179, gives a full working flame for ordinary bench operations, which, as might be expected, is exceedingly hot, enabling heating operations to be carried on in very little more than half the time that is required when coal gas is used. For ordinary flame and spectroscopic reactions it is excellent, and the use of the blowpipe can be dispensed with for a great many small

operations. For example, a few grams of zinc, if heated for five minutes in a covered crucible, will take fire and burn readily on the removal of the crucible lid. Naturally this heat has its disadvantages for some purposes, particularly in necessitating additional care in bringing glass apparatus into the flame. Jena glass stands well, of course, and a good Bohemian beaker or flask, with its contained liquid, may generally be exposed to the flame with impunity, but thicker German-glass vessels are very liable to crack on sudden exposure to the flame. The flame cannot be turned down low without becoming luminous when the Bunsen is adjusted to give a non-luminous flame of good size, though small non-luminous flames may be obtained by adjustment of the burner for this purpose alone, and this under so small a pressure as three inches of water. This luminosity, on turning down the full-sized burner, enables a collar to be dispensed with, since for blowpipe work the luminous zone appears of itself when the flame is lowered, but for all other reasons it is a disadvantage. Moreover, if the jet is enlarged or filled up to any extent, this luminosity may appear in the full flame. The jets do



Various burners for use with acetylene.

want occasional adjustment with a fine probe or a light hammer, but it is not found in practice that this occurs sufficiently often to form a serious disadvantage.

The various modifications of the Bunsen are not easy to imitate for acetylene, and the styles of the various burner-tops used for coal gas are quite useless. The acetylene Bunsen referred to is, however, furnished with a welt on which suitable tops may rest; these consist at present of an attachment to produce a fish-tail flame, and one to give a ring of small points for evaporations. A similar burner to the last, but one in which the points lie in a straight line also, exists. Very powerful combinations of several burners on the same stand may be made. A six-jet burner suitable for heating a small muffle-furnace is shown, together with the above forms, in the photograph which illustrates this article. One advantage which such multiple burners have over those for coal gas is that they can, owing to the small consumption of gas, be used off ordinary bench fittings with ordinary quarter-inch tubing.

Glass working, especially with potash glass, is considerably facilitated by the use of acetylene, but the flame tends to promote devitrification very

rapidly. The gas can be used with the blowpipe, and here, of course, any apparatus used for coal gas is applicable, since the air supply can be regulated at will. With a powerful air-supply the acetylene blowpipe becomes a most valuable weapon for producing very high temperatures, and if oxygen be used instead of air, the heat is probably only rivalled by the electric arc. Steel may be readily melted, and we can cite an instance in which a hole was melted through a small London-clay crucible of very reputable make, when oxygen was used.

Taking the advantages and disadvantages of the gas for the laboratory bench together, there is no question as to the pre-eminence of the former. Certainly the laboratory which, we believe, has had the longest experience of this use of the gas would not now make an exchange in favour of coal gas. Perfection is yet to be attained, it is true, and we look to the manufacturers of carbide to supply the means for improvement by enabling us to dilute the gas a little from the start.

THE TEACHING OF HISTORY AND GEOGRAPHY IN PRUSSIA.

By A. HARGREAVES.

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IN continuation of the article on "Modern-Language Teaching in Prussia" in the September, 1901, issue of *THE SCHOOL WORLD*, the syllabus for history and geography may with advantage be described. The time devoted to history is about the same in all kinds of schools, and ranges from two to three hours a week over a seven-years' course. In the two years preceding this course, one hour is devoted to stories from German history and the Sagas from the oldest Greek and Latin history. From this point the syllabus is as follows:—

History.

IV. 2-3 hours weekly.—Greek history to the death of Alexander the Great: Roman history to the death of Augustus. The period previous to Solon's death on the one hand and the war with Pyrrhus on the other is treated as shortly as possible (this in consequence of the preliminary work already mentioned). The most important points about the cultured Eastern nations are touched upon in connection with Greek history. A detailed description of the encounters between the Romans and Germans during the Republic is deferred till the next class. The most important dates are learnt.

Lower IIIrd. 2 hours weekly.—The golden age of the Roman Empire under the great emperors. German history from the first encounter of the Germans with the Romans till the end of the middle ages. The history of other countries is treated as far as is necessary for a proper understanding of German history. Dates as in IV.

Repetition of ancient history based on the dates learnt.

Upper IIIrd. *2 hours weekly.*—German history from the end of the middle ages till the beginning of the reign of Frederick the Great, with special reference to Brandenburg-Prussian history. Foreign history is touched upon where necessary for a proper understanding of the main subject. Dates as in IV. Repetition according to the dates learnt.

Lower IInd. *2 hours weekly.*—German and Prussian history from the beginning of the reign of Frederick the Great to the present day. Foreign history as in Upper IIIrd.

Frederick the Great, the French Revolution, Napoleon I. (especially his relations to Germany), the fall and rise of Prussia, the wars of freedom (Befreiungskriege), the internal changes in Prussia, the re-arrangement of the political relations of Germany in 1815, the German Customs Union, the striving for political unity, the deeds of Kaiser William I., and the founding of the German empire are to form the chief part of the syllabus for this year. In connection with the German history and the lives of the various rulers, a comparison is to be drawn of the social, political and commercial development up to the end of the eighteenth century, giving prominence to the deeds of the Hohenzollerns, especially with regard to the elevating of the peasant, middle and working classes. Repetition of the Brandenburg-Prussian history according to the dates learnt.

Upper IIInd. *3 hours weekly.*—Chief events of Greek history up to the death of Alexander the Great, and of Roman history up to the death of Augustus, touching lightly upon the East. Special regard is to be paid to the political, social, and civil relations which are to be grouped and compared. Repetition from German history according to dates to be learnt.

Lower Ist.—The Roman emperors who had most influence on the world's culture. German history to the end of the Thirty Years War, with a deeper study of the political, social and civil relations. General idea of the rise of the states from 1648. Foreign relations which are of importance in the world's history, the Crusades, the movements for reform in the Church, the discoveries of the fifteenth and sixteenth centuries, are to be treated from more general points of view than in the IIIrd. Repetitions from ancient history according to dates learnt.

Upper Ist.—The most important events of modern times, especially of Prussian-German history from the end of the Thirty Years War up to the present time. In connection with the lives of the great Elector Frederick William I., Frederick William the Great, Frederick William III., and Kaiser William I., comparative studies as in the lower IInd., but correspondingly deeper.

Thus we see that, contrary to the practice in English schools, the teaching begins with ancient history and then goes on to older German history, gradually working up to modern times, whence it

returns covering the ground more fully. The whole period of German history has been treated when the scholar has passed the lower IInd., after which many of the scholars leave.

METHOD.—(1) The object of the preliminary instruction in the first two classes is to present the great heroes of the past to the heart and mind of the young scholar, in that way to develop his thoughts, and together with the stories from the Bible, to lay the foundation for historical perception and observation. The enthusiasm of the teacher and a sympathetic and vivid description of the heroes are the chief factors at this stage. A special course is not adopted, but it is important that the prose and poetry of the German reading book should stand in close relationship with the biographies.

(2) For the other classes the great thing is to distinguish the instruction in IV. to Lower IInd. from that of the upper classes. For the former the acquisition of the chief facts, especially with reference to prominent persons and the chronological order of events, are of primary importance; while, for the upper classes, stress is laid on the development and comparison, from different points of view, of the matter already learnt. Even in the upper class the presentation of facts and their retention in the memory are not neglected, but together with outward events weight is laid on the internal relations, which naturally cannot be touched upon in the lower classes. Above all, the utmost importance is at this stage given to developing the capability of interpreting the present from the facts of the past, and of getting a clear idea of the relationship of the events to one another. Inducement is given to the scholars to esteem sufficiently such events in the mental and industrial life of the people which have had an influence on their development.

(3) Success depends chiefly on the personal qualities of the teacher, which only come into operation where the matter is freely treated and freely presented to the class.

Great tact and prudence are required in the selection and treatment of social and industrial questions (Lower IInd and Upper Ist). The justice of many of the present social demands is to be conceded, but the evil of all forcible attempts to change the social order is to be made clear.

The efforts of the ruling line on behalf of the people are presented wherever the history of the last hundred years offers an inducement to touch upon the social and political measures of other European States.

(4) The grouping of historical facts comparatively and from different points of view is recommended, especially for the repetitions, which are carried out in all classes to confirm the matter already learnt by heart without overburdening the scholars with unnecessary ballast in the way of dates. Books which present history in a connected form, an atlas, and a date book are used in classes IV. to Upper Ist. Free, connected descriptions by the scholars of what has already been learnt are practised wherever possible.

Geography.

The general aim is the acquisition of an intelligent understanding of surrounding nature and of maps, knowledge of the physical form of the earth, of the divisions of the inhabitants, and some knowledge of the principles of mathematical geography. The syllabus is as follows:—

VI. *2 hours weekly.*—Principles of general geography with reference to the immediate neighbourhood. Introduction to globes and maps. Elements of a knowledge of countries, beginning with the home and Europe. Books are not allowed.

V. *2 hours weekly.*—Countries of middle Europe, especially the German Empire. A book is used. Further instruction with reference to the globe and maps as well as of reliefs. Simple sketches on the blackboard.

IV. *2 hours weekly.*—Europe except the German Empire. Simple sketches on the board and in copy books.

Lower IIIrd. *1-2 hours weekly.*—Countries out of Europe. German colonies: comparisons with the colonies of other lands. Sketches as in IV.

Upper IIIrd. *1-2 hours weekly.*—Repetition of German Empire. Sketches as in IV.

Lower IInd. *1-2 hours weekly.*—Repetition of European countries except German Empire. Elements of mathematical geography. Sketch maps as in IV. In the "Realschulen" the most important commercial and traffic routes of the present time.

Upper IInd.—Upper Ist. *1 hour weekly.*—Repetition and principles of physical geography. Elements of mathematical geography correlated with the instruction in mathematics or physics.

METHOD.—(1) The practical utility of the subject must be kept in view throughout. Physical geography is not given the preference over political, both are united as closely as possible in dealing with the different countries. Intelligent observation of the surrounding country as well as of reliefs and maps is brought into play, committing to memory whatever is considered necessary. Only a few round comparative numbers are to be learnt by heart.

(2) The first steps in physical and mathematical geography are confined to the neighbourhood of the school. When general principles have been understood they are represented by reliefs and the globe. The use of the map is then learnt gradually by the pupil. The wall map and atlas are later on the chief objects in class teaching. Books only serve as guides for preparation at home. Great attention is given to the correct pronunciation of proper names.

(3) In the lower and middle classes the same atlas is used. Large atlases are not allowed in the lower classes. Care is taken to see that the wall maps agree as much as possible with the atlases.

(4) Great importance is given to sketch drawing as an auxiliary to clear representation, but outline sketches and profiles on the board are alone expected. Map drawing at home is in general not

allowed. The scholars confine themselves to simple sketches during the time of instruction, the teacher himself first draws the sketches on the board.

(5) The teaching is in the hands of teachers who have made a special study of geography and is not divided among too many teachers. The repetitions in the upper classes of gymnasia, so far as physical and political geography are concerned, are in the hands of the teacher of history, the mathematical geography in the hands of the teacher of mathematics or physics.

The Emperor has several times insisted on the great importance of placing the teaching in the hands of properly qualified men. At most universities there are now professors of geography, and this branch may be taken as an optional subject by the students at their examinations.

EXPERIMENTS IN MECHANICS.¹

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EXPERIMENT WITH THE FIVE-ROPE PULLEY BLOCK.

OBJECT OF EXPERIMENT:—To determine (1) The velocity ratio of the machine. (2) The general relations between the load and (a) driving force, (b) friction, (c) mechanical advantage and (d) mechanical efficiency.

Method:—It will be found very convenient to use the vertical post in Fig. 6, to aid in determining the velocity ratio by experiment. Of course, with the simple machine, it is an easy matter to calculate the velocity ratio, but as the experimental method is interesting and useful, it is given here in connection with the simple machine. The vertical post is made from a couple of strips of wood, separated by a distance piece at each end, forming a long slot in which the horizontal pointers P and N can be adjusted by thumb nuts. A small weight of (say) 14 lbs. is suspended from the load hook and another weight (say 7 lbs.) suspended from the spring-balance hook. These weights should be such that they will remain in any position in which they may be placed. Begin by moving the spring-balance end downwards so that the weight 7 lbs. is as near as possible to the floor but does not touch it. While in this position, set the upper

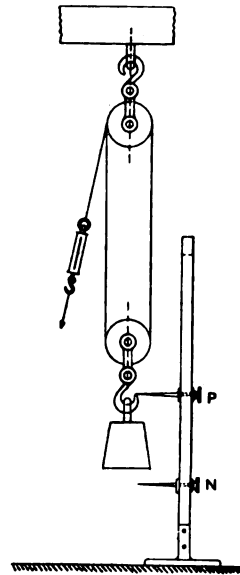


FIG. 6.

¹ Concluded from p. 403, November, 1901.

pointer in the vertical post exactly level with some characteristic point in the load end of the pulley block. Then move the spring-balance end upwards through a distance of say 10 inches and set the lower pointer level with the same characteristic point. Measure, with a boxwood or steel scale, the distance of the underside of the 7 lbs. weight from the floor. This is the distance moved by the driving end, while the load end has moved through the distance between the two pointers P and N.

Repeat the measurements with other movements, and results something like the following will be obtained:—

Distance moved by Driving end.	Distance moved by Load end.
10 inches	2.1 inches
17 "	3.3 "
23 "	4.6 "
28 "	5.5 "
34 "	6.8 "

Now plot these quantities on squared paper as in Fig. 7, and draw a straight line through the average position of the points.

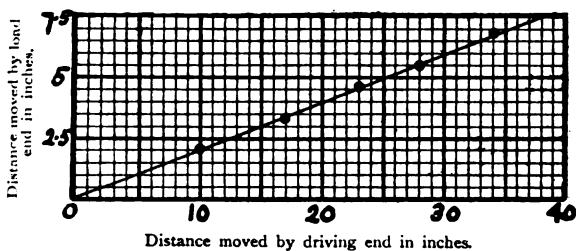


FIG. 7.

Should any of these lie far from the line, we may remember that theoretical considerations show that the line passes through the origin. The slope of the line gives the ratio:—

$$\frac{\text{Movement of load end}}{\text{Movement of driving end}},$$

which by definition

$$= \frac{1}{\text{velocity ratio}}.$$

From the measurement of the slope we obtain as nearly as possible 5 for the velocity ratio. This is the number which we ought to obtain; as the number of ropes supporting the load end is five.

Remove the 7 lbs. from the spring balance. Pull *steadily* on the spring-balance hook with both hands, making it move at a *uniform rate*; at the same time read the indication of the pointer. It was 4.5 in the experiment being described. Now determine the driving force which will permit the machine to run backwards. This is done by allowing the spring balance to move in the reverse direction at the same rate as in the forward direction and observing the indication. It was about 0.9 lb.

Now change the load to, say, 21 lbs. and repeat the observations, after which the load is further changed until the complete range has been used. The ob-

servations are tabulated in the first three columns below. The mechanical advantage

$$= \frac{\text{Load}}{\text{Driving Force}},$$

and

$$\text{Mechanical Efficiency} = \frac{\text{Mechanical Advantage}}{\text{Velocity Ratio}}.$$

$$\text{Velocity Ratio} = 5.$$

Load lbs.	Driving Force lbs.		Mechanical Advantage.	Mechanical Efficiency.
	Lifting.	Lowering.		
7	2.6	—	2.6	0.54
14	4.5	.9	3.1	0.62
21	6.3	1.5	3.3	0.66
28	8.5	2.8	3.3	0.66
35	10.3	3.7	3.4	0.68
42	12.0	4.7	3.5	0.70
49	13.9	5.7	3.5	0.70
56	16.1	6.5	3.5	0.71
63	17.4	8.0	3.6	0.72
70	19.3	8.9	3.6	0.72
77	21.2	9.5	3.6	0.72
84	23.0	10.5	3.6	0.72
91	25.5	11.7	3.6	0.72
98	27.0	12.5	3.6	0.72
105	29.0	13.5	3.6	0.72
112	31.0	14.7	3.6	0.72

The fourth and fifth columns have been calculated with a slide rule, and the third significant figure omitted.

To obtain the general relations between the load and the other quantities we must plot these quantities on squared paper, using a load base. This has been done in Fig. 8.

The line GLC is the driving force line (lifting), and DH the same when lowering; that is, the ordinates from the base to these lines represent the several values of the driving force. Similarly, the curve BF gives the mechanical efficiency at the different loads, and as the mechanical advantage = the mechanical efficiency multiplied by a constant (VR), the same

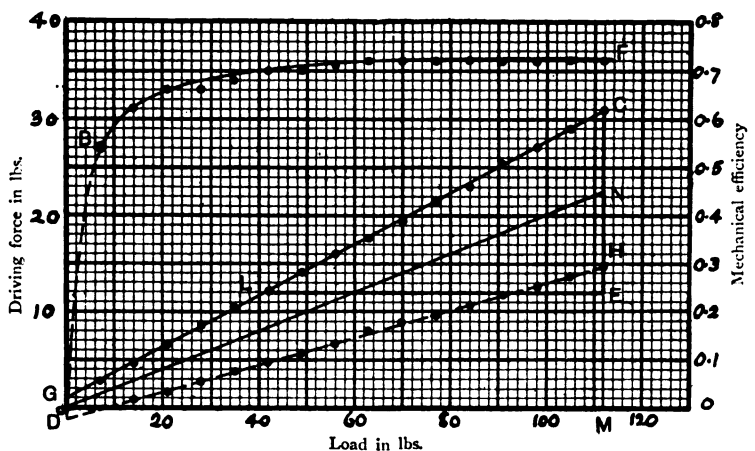


FIG. 8.

curve also represents the mechanical advantage to another scale in which the divisions are smaller in size and equal to

$$\frac{\text{length of efficiency scale divisions}}{\text{velocity ratio}}.$$

As the driving force lines are *straight*, we can write down their equations. The general equation to a straight line is

a vertical ordinate = a constant + $\left\{ \begin{array}{l} \text{the slope} \times \text{the} \\ \text{corresponding horizontal} \\ \text{ordinate} \end{array} \right\}$

But in this case vertical ordinates represent driving force, and horizontal ordinates the load; hence we may write the above equation

$$\text{Driving force} = \text{a constant} + \text{slope} \times \text{load.}$$

The slope of the line GC is $\frac{CE}{EL} = \frac{19}{70} = \cdot 27$ and the constant is the height (1) at which the line GC cuts the vertical axis at G; hence the above equation becomes:—

$$\text{Driving Force} = 1 + \cdot 27 \text{ load.}$$

This is the general relation between the load and driving force for any range of loads. Further, the mechanical advantage equals the load divided by the corresponding driving force. Substituting for the driving force from the above equation we have:—

$$\begin{aligned} \text{Mechanical Advantage} &= \frac{\text{load}}{\text{driving force}} \\ &= \frac{\text{load}}{1 + \cdot 27 \text{ load.}} \end{aligned}$$

Also the

$$\begin{aligned} \text{Mechanical Efficiency} &= \frac{\text{Mech. Advantage}}{\text{VR.}} \\ &= \frac{\text{load}}{(1 + \cdot 27 \text{ load}) \text{ velocity ratio.}} \end{aligned}$$

This last equation is the equation to the curve BF in Fig. 8, the dotted portion of which is obtained by substituting different values for the load between zero and 7lbs. This should also be done where the points are very irregular in the curve BF, such as the fourth, fifth and seventh points.

We may obtain the portion of the driving force required to overcome friction in two ways. From theoretical considerations we know that, if there were no friction, the driving force would equal

$$\frac{\text{load}}{\text{velocity ratio.}}$$

If we subtract this from the actual driving force (with friction), the difference must be that portion of the actual driving-force required to overcome friction. This we generally call simply the friction for brevity. We may then write

$$\begin{aligned} \text{friction} &= \text{actual driving-force} - \frac{\text{load}}{\text{VR.}} \\ &= 1 + \cdot 27 \text{ load} - \cdot 2 \text{ load} \\ &= + \cdot 07 \text{ load.} \end{aligned}$$

The first term is due to the weight of the parts of the machine alone, while the second term is due to the load alone.

The second method of determining the friction of a machine is also interesting. From the above we have learnt that

$$\left. \begin{array}{l} \text{the actual} \\ \text{driving-} \\ \text{force} \end{array} \right\} = \left\{ \begin{array}{l} \text{that reqd. to} \\ \text{lift load without} \\ \text{friction} \end{array} \right\} + \left\{ \begin{array}{l} \text{that reqd. to} \\ \text{overcome} \\ \text{friction.} \end{array} \right\}$$

The first term on the right we have already found to be 0.2 load. Substitute the different values of the load in this term and plot them in Fig. 8. We then get the line passing through N, and the origin. Then with the load of 112lbs. represented by DM, the actual driving force is represented by MC, and the driving force required to lift the load WITHOUT

friction is represented by MN, and therefore NC represents the friction. From this we see that the vertical intercept between the line GC, and that through N and the origin, represents the friction. *Now friction always opposes motion*, and consequently when the machine is running backwards, friction is still opposing motion, that is, it is trying to prevent the machine from running backwards, and is therefore assisting the driving force. Consequently, the actual driving force applied by the hand while the machine is running backwards equals the driving force without friction minus the friction. The difference between this expression and the last equation is twice the friction. Hence the vertical intercept between the lines GC and DH represents twice the friction at the particular load in question. For example, at the load DM = 112 lbs., the intercept HC represents twice the friction. Hence bisect any intercept and we get the friction at that load. The points of bisection will lie on the line through N and the origin.

This shows how the effect of friction may be got rid of, should such be required. The line through N and the origin may be called the ideal driving-force line.

It is often stated in text books that a machine will not run backwards of its own accord if its efficiency be less than 50 per cent.; but the fact is seldom demonstrated so that the junior student can appreciate it.

Returning to Fig. 8, we have seen that the line through N and the origin (the ideal driving-force line) bisects the vertical intercepts between DH and GC. Let us pass to a machine which is less efficient than the one just considered, but one in which the same driving-force and load relationship holds. This will necessitate the velocity ratio being greater than (5), which is that of the machine just considered. The friction being greater than before, the line through N will be lower than in Fig. 8, and consequently the line DH will have a much less slope, the point H being considerably lower.

If we carry the argument still further the line DH will eventually fall entirely below the base line, indicating that a negative driving force must be applied to compel the machine to run backwards; as we actually find in the screw jack and the endless screw.

Now consider the case in which the point H has fallen to M. The machine will run backwards with a load DM with no driving force (positive or negative). The corresponding point N must be half-way up MC, or in other words, the friction NC is half the driving force MC, and consequently that portion of the driving force which is doing useful work in lifting the load is

$$MN = \frac{MC}{2} \quad \text{That is, of the whole driving force MC, half of}$$

it is spent in doing useful work and half in overcoming friction; therefore the efficiency of the machine is $\frac{1}{2}$, or 50 per cent.

$$= \frac{NM}{CM} \quad \text{If now the point H drops below M, we shall have to}$$

apply a negative driving-force to run the machine backwards; that is, *it will not run back of its own accord*. At the same time, if H drops below M, N will drop below the middle point of MC, and the useful driving-force, MN, will be less than half the total MC, or the efficiency will be less than 50 per cent.; hence the machine will not run back of its own accord if its efficiency is less than 0.5.

PORTENTS AUGURAL.¹

THERE are several reasons why the writings of Mr. H. G. Wells find many readers among schoolmasters. He has passed through the same mill as themselves and knows the intensity of the pressure between the upper and nether stones. As similar circumstances tend to the development of like characteristics and interests, they find themselves attracted by what Mr. Wells says, whether it be a direct expression of opinion in a didactic essay or the utterance of one of his characters. His incisive style, independent thought, and fertile imagination unite to command their appreciation and create a desire to emulate him.

For these reasons, and because the development and improvement of the human race is largely a question of educational procedure, we do not hesitate to direct the attention of our readers to the most recent book of this author. "Anticipations" is a serious attempt at prophecy which places Mr. Wells among our philosophers and assures him a high reputation as a perspicacious student of human nature and affairs.

In Hebrew history a man is described as a prophet for one of two reasons; either because he foretold future events, or else, as when Ezekiel prophesied to the dry bones, by reason of his exhortations. Mr. Wells must be placed among the prophets on both these accounts, for he not only diagnoses the future, but makes it clear, even to the wayfaring man, how possible dangers may be averted. With an intimate knowledge of modern science and the teachings of Darwin and his school, supplemented by a good working acquaintance with the histories of the great peoples of the earth, Mr. Wells applies his scientific imagination, having throughout a careful regard to modern tendencies, to the task of unfolding the lines along which mankind will evolve and what will probably be the distribution, divisions, and distinguishing characteristics of the people living in the year 2,000.

It is perhaps a little unfortunate that Mr. Wells has already written "When the Sleeper Wakes" and "Tales of Space and Time," not only because many readers will at first imagine "Anticipations" is another scientific romance, but more especially since he has found it necessary to modify some of his previous beliefs as to the dominant section of humanity in the years to come. A prophet, to carry conviction—with the mass, that is—must be dogmatic and insistent. Yet this very failure to impress the crowd will be itself a great attraction for thinking persons. "Here," such a reader will say, "is an earnest effort to find the truth."

It would be out of place for us to attempt to sketch, even roughly, the varied contents of "Anticipations." But since the effective rulers of the New Republic are, it is argued, to be the

suitably educated members of the race, it will be interesting to note what, in view of the trend of things, "suitably educated" means. The trained capables of the year 2,000 will be—

a great inchoate mass of more or less capable people engaged more or less consciously in applying the growing body of scientific knowledge to the general needs, a great mass that will inevitably tend to organise itself in a system of interdependent educated classes with a common consciousness and aim

What will fit men to take their places among the elect at the beginning of the twenty-first century? Mr. Wells never leaves his reader in any doubt. It is, in a word, thorough, sane education:—

The necessary condition to the effective development of the New Republic is a universally accessible, spacious, and varied educational system working in an atmosphere of efficient criticism and general intellectual activity. Schools alone are of no avail, universities are merely dens of the highest cramming, unless the schoolmasters and schoolmistresses and lecturers are in touch with and under the light of an abundant, contemporary, and fully adult intellectuality.

There is, however, urgent need of an absolutely new type of school—a school that shall be at least so skilfully conducted as to supply the necessary training in mathematics, dialectics, languages and drawing, and the necessary knowledge of science

The war of the coming time will really be won in schools and colleges and universities, wherever men write and read and talk together. The nation that produces in the near future the largest proportional development of educated and intelligent engineers and agriculturists, of doctors, of schoolmasters, professional soldiers, and intellectually active people of all sorts will certainly be the ascendant or dominant nation before the year 2000.

The teacher will teach, and confine his moral training, beyond enforcing truth and discipline, to the exhibition of a capable person doing his duty as well as it can be done. He will know that his utmost province is only a part of the educational process, and that equally important educational influences are the home and the world of thought about the pupil and himself.

Describing the education of the future as he does, it was inevitable that Mr. Wells should give his estimate of our modern school-system. His verdict is far from flattering. He never, we think, merely vituperates; his censures always breathe of an earnest desire to bring about an improved condition of things. Not only when treating of modern education, but throughout, the book is strong food for men, and to such adults it is certain to prove a tonic, even though it should be an unpalatable one.

We have, perforce, confined our attention to one aspect only of this message to struggling humanity, yet there can be no doubt that all the subjects of the author's prophesyings will interest teachers, while the charm of his English, the throbbing, living appeals to the wise reader's reason, and the triumphant march of his descriptive passages, will much more than repay the expenditure of time demanded by the perusal of the book.

¹ "Anticipations of the Reaction of Mechanical and Scientific Progress upon Human Life and Thought." By H. G. Wells. (Chapman & Hall.) 7s. 6d.

COMMERCIAL EDUCATION.

IN Mr. Whitfield's book¹ we have: (1) A survey of the systems of commercial education in different countries. (2) Proposals for a complete system of commercial education in England. (3) Suggestions on methods of teaching with a miscellaneous amount of information bearing on commerce.

(1) The account given of "Commercial Education" in the German Empire is quite misleading. Compulsory attendance at continuation schools in Prussia is a matter of local option, and is the exception, not the rule. Pupils of intermediate modern schools, when destined for business, *do not*, except in isolated cases, pass to higher mercantile schools. The fact is that the modern schools themselves keep in view the requirements of commercial life. Higher mercantile schools so-called are to be found in only three towns of Prussia, viz., Cologne (2nd grade), Frankfort o/M. (1st grade), Aix-la-Chapelle (1st grade). Saxony, on the other hand, does provide a very fair number of "commercial schools" of a more pronounced type than the Realschule, and continuation schools with compulsory attendance are to be found throughout the kingdom. Much is made of the regulations of the Bavarian Government relating to "commercial" teachers; the truth is that their application is so limited that they afford no indication whatever of the qualifications of masters in German commercial schools. More accurate treatment is accorded to France. The patent omission is the explanation of the attractiveness of the twelve "superior" schools of commerce. It is well known that their roll-call is a vastly exaggerated measure of the genuine demand for higher commercial instruction, that in fact the "superior" edifice would shrink to perhaps a tenth of its present dimensions were it to lose the exceptional privilege relatively to military service. The author makes no mention of the "Ecoles Pratiques de Commerce" (under the Ministry of the Industry and Commerce) which are to be found in a large number of French towns. Much useful information is given us in connection with the United States and Japan. The part dealing with the United Kingdom is comprehensive and accurate.

(2) With regard to the future organisation of our commercial education, the following proposals are made:—(a) The creation of commercial sides at higher elementary schools. We imagine that the boys from 12 to 14 years of age will have to be somewhat precocious, if they are to make much of the ambitious curriculum that embraces modern languages, book-keeping, commercial geography, and object lessons on trade products, simplified economics, elementary mathematics, science, drawing, shorthand, "business training." (b) The further formation of evening continuation schools for boys employed in offices. (c) The bifurcation

of the upper division of intermediate schools into a commercial and an industrial section. (d) The creation of a modern department *without bifurcation* in first-grade schools. (e) The establishment of institutes of commerce with a three-years' course for boys of 16 years of age and upwards. Why should not the first-grade school provide this training? (f) The establishment of post-graduate (*sic*) courses, such as the School of Economics provides.

(3) The third portion of the book is made up of diffuse talk and a patchwork of quotations. But it contains much that is suggestive to teachers.

The most valuable feature of the book is the ample bibliography furnished on the various topics discussed.

By "commercial education," say Messrs. Hooper and Graham in the second book¹ under notice, "we mean a *practical* education suited to the needs of the present day, and calculated to fit young people intended for business careers for the work they will have to perform, and to better equip for the work those already in business." This definition begs the whole question of the curriculum; it assumes at once that it is the *practical* course of study, such as the authors lay down without any appeal whatever to psychology, that is best calculated to fit people for business. It is this very contention which is rebutted by many schoolmasters who cling to school traditions. In the interests of commercial education we wish that the authors had gone more deeply into the matter, and had presented us with something more convincing than their insistence on the educational aspect of a commercial curriculum.

Five essentials are given for a course of higher commercial education, following the ordinary secondary-school course:—Modern Languages, Commercial Practice, Study of Materials, Principles of Commerce, Commercial Law. The methods of study of the various subjects falling under these groups are discussed.

Under "Modern Languages" we are urged to abandon our "trifling" attitude, to do our work thoroughly and to pursue our methods educationally, bearing in mind that the tongue must be trained equally with the ear and the eye. To this excellent advice a useful addition would have been the sketch of a syllabus for commercial schools, showing how far commercial requirements necessitate a supplement to the ordinary literary pabulum. It is right that our attention should be drawn to the demands made by Eastern markets on a knowledge of Oriental languages. We are shown what the Universities of Berlin, Paris, and Vienna have done to meet the want; but the authors seem evidently to be ignorant of the existence of the School of Oriental Languages attached to the Imperial Institute in London. The "Commercial Practice" course, as described by Messrs. Hooper and Graham, co-ordinates the study of the machinery of business, book-keeping,

¹ "Commercial Education in Theory and Practice." By E. E. Whitfield, M.A. (Methuen & Co.)

¹ "Commercial Education at Home and Abroad." By Frederick Hooper and James Graham. (Macmillan & Co.)

and arithmetic. It affords an excellent training for the clerical work that the commercial assistant is called upon to perform. We are inclined to think, however, that for higher commercial requirements the treatment of the whole subject should be more scientific, or that, at any rate, it should be taken simultaneously with or subsequent to "The Principles of Commerce" and "Commercial Law."

More than half of the book before us deals with the actual provision of commercial education in different parts of the world. Germany, of course, leads the way. In spite, however, of the prominence given to this country, it will appear, both from the map and the list of schools, that, after all, not very much has been done in the way of *specialised* commercial instruction over and above that given in elementary continuation classes. The diagram showing the organisation of commercial education in Germany has no relation to actuality. The whole section on "Commercial Education Abroad" seems to have been derived from prospectuses of schools, and is for that reason misleading in the extreme. The thing becomes ridiculous when, in the case of Leipzig, the prospectus of the "Handelslehranstalt" (Secondary School of Commerce) slips into the programme of the "Handelshochschule" (Commercial University). Boys of second-grade secondary-school age are made to have a curriculum embracing such subjects as finance, international law, statistics, German colonial policy!

When we come to "Commercial Education" at home, we find that the United Kingdom and the West Riding of Yorkshire are co-extensive. We are indeed furnished with some extremely interesting and useful information of what has been achieved in Messrs. Hooper and Graham's county; but "Particulars of what has hitherto been done in the United Kingdom" should embrace more than the Yorkshire experiment. The work done by London Polytechnics, School Boards, the School of Economics, and some of the large day-schools is surely deserving of mention and even of description.

A Class Book of English History. By Arthur Hassall. xix. + 603 pp. (Rivingtons.) 3s. 6d.—This is a handy and useful outline of the facts of English history, well supplied with maps, plans, tables, "notes and illustrations" (not pictorial), and a full index, and well deserving to be put into the hands of the candidates for the various examinations mentioned on the title-page. But there is very little depth in it. The teacher will require to supply, for the most part, explanations of the movements here narrated, especially of the drift in matters constitutional. On the whole it fulfils the author's promise of being written in the light of the most recent research; but we have noted that he still attributes many grammar schools to Edward VI., that he retains "Morton's fork" in the text, though "discrediting" it in a footnote, that he thinks the word "Cabal" was made out of the initials of its members, and we think his account of the Statute De Tallagio non Concedendo does not conform to "Stubbs." But the greatest complaint we have to make is the author's apparent ignorance of Puritan and Separatist, Presbyterian and Congregationalist history.

TWO AMERICAN MANUALS OF GENERAL HISTORY.¹

THE American School and College Text-Book Agency have sent us two of the four manuals of General History which appear in their catalogue. The subject is not familiar to us over here; it does not appear in the syllabus of any of our public school-examinations; and apparently few teachers think it worth while on their own initiative to introduce the subject, even though they believe as heartily in its utility as does Mr. W. M. Childs (see *SCHOOL WORLD*, April, 1901). But it seems to be taken up in American schools so extensively that publishers thought it worth while producing twenty or thirty different books to meet the demand. Some of these are compilations put together with more or less care by persons who have not had a scientific training in history; others are by university professors, some of whom have a European reputation. Both the varieties are exemplified in the two books before us. Mr. John Anderson's "New Manual of General History" bears on its title page the date of 1899, but the preface is dated 1882, and there are many signs in the book lists, &c., that the book has either not been recently revised or has been revised very badly. The book is not attractive in outward show, and as for the text, here is a fair sample from a chapter on the Progress of Civilisation in Modern Europe:—

Modern history commences at the epoch at which the dawn of intelligence broke upon Europe. In the latter part of the fifteenth century the civilisation of the Greek Empire had disappeared before the conquering arms of the rude and ferocious Ottomans; and the western nations, emerging from the night of mediæval ignorance, began to glow with the first beams of that intellectual and social illumination to which they have attained.

Teachers who still use Collier may agree with the author in regarding this as written "in a pleasing and instructive style"; but for our own part we think the "outline reviews, topical synopses, and chronological tables" with which the book is copiously supplied are more deserving of approbation—and indeed of imitation in historical manuals generally. On the whole, the book strikes us as not worth the trouble of transportation; and we hope that teachers will discourage this particular "immigrant alien" by ignoring its existence.

The other book stands on a wholly different footing. The author is Professor of Economics in the University of New York, and is—if we may judge from his portrait in the publisher's excellent catalogue— young and alert. These are not personalities. Mr. Colby's youthfulness accounts both for the briskness of his style and for a certain amount of inexperience in his terminology; while as for his position it may safely be said that,

¹ "New Manual of General History for the use of Colleges, High Schools, Academies, &c." By John J. Anderson, Ph.D. 683 pp. (New York: Maynard Merrill & Co.) 8s.

"Outlines of General History." By Frank Moore Colby. 564+lxii. pp. (Bibliography and Index.) (New York: American Book Co.) 7s. 9d.

Each book has about 200 illustrations and maps, many coloured; and both are on sale, at the prices named, at the American School and College Text-book Agency, 9, Arundel Street, Strand, W.C.

though an economist is not necessarily a good historian, no good general history can possibly be written without a knowledge of economics. Mr. Colby's address is "University Heights, N.Y.," but he can descend to school level without inconvenience to himself and his readers: his facts are well chosen, admirably arranged, expressed in simple and sensible language, and are above the usual standard of accuracy. His book needs revision—all first editions do—and it would be vastly improved if it were equipped with the teaching apparatus usual in American manuals of history. In price, size, and general get-up, it invites comparison with the "European History" of Prof. G. B. Adams, of Yale. On the whole the bibliographical side-notes in the latter book—very ill balanced by Prof. Colby's sedimentary bibliography—incline us to give it precedence as a teacher's book, while the greater fulness of Prof. Colby would make it a more complete class-book. Both are a great deal too casual in their terminology, and would expose their users to the danger of Mr. Evans's recent strictures in these columns, and both need some slight adaptation for use in the British Isles. But if we were looking out for a text-book of General History for class use, and were allowed to adopt more than one, Prof. Colby's would certainly be among the chosen. We should be grateful to Mr. Anderson for his suggestions and help in teaching, but we should hesitate to incur the responsibility of placing his book in the hands of boys and girls in their teens. And we cherish the belief that there are some other American manuals of General History, not kept in stock over here, to which the American Agency might well direct its attention.

COLLEGE COURSES FOR ELEMENTARY SCHOOL TEACHERS.¹

THE educational pessimist should study the "Specimen Courses of Instruction for Training Colleges suggested by the Board of Education," recently published. The days of the old wooden curriculum which prescribed in detail the subjects to be studied by students in all training colleges are numbered. The man of science is abroad. Instead of employing his time in concocting weird "notes of lessons" on subjects of which he was more or less profoundly ignorant, the teacher in training to mould the minds of our future workers is henceforth to be shown "(a) how to encourage thoughtfulness, originality, inquisitiveness, and observation in children; (b) how children may be induced to find things out for themselves, and so to help in the development of their own character and education; (c) that lecturing is not teaching; and (d) that education means the training of the mind, not the storing of the memory."

¹ "Specimen Courses of Instruction for Training Colleges suggested by the Board of Education." London, 1901.

With these objects in view, the syllabuses of the subjects which engage the attention of students in training colleges—it is almost unnecessary to add "for elementary school teachers," since such institutions for secondary schoolmasters are almost unknown—have, in the hands of the recent Committee, undergone a complete metamorphosis. The directions which are given respecting the teaching of mathematics and science show clearly how profoundly the missionary efforts of Professors Armstrong and Perry have influenced the authorities. Now the future elementary schoolmaster is to be encouraged to familiarise himself with the use of logarithms, the slide rule, with squared paper and the plotting of curves. Euclid is to be dethroned, and we are to have in his place a practical introduction to geometrical concepts by way of an experimental demonstration of the properties of triangles, quadrilaterals, circles and other figures. Closely linked to a mathematical training on these rational lines there is to be careful instruction in the "research" method of teaching science. The laborious learning of scientific facts by rote, which is worse than useless since it eclipses the true function of science in education, is to be displaced by a practical introduction to the method of science, the plan of answering new questions which present themselves by a carefully planned experiment skilfully arranged with this object in view.

But the influence of the scientific method is by no means confined to the instruction the scholastic tyro is to receive in mathematics and science. Modern languages are to be treated as living languages, and success will be gauged by the power the student develops of expressing himself in the foreign tongue, whether by writing or speaking. History is, in these specimen courses, something quite distinct from a mere chronicle of events and their dates. Students are to study some of the great movements of mediæval and modern European history, to be taken on the widest lines, with the object of making a framework of historical ideas for later detailed study. So, too, in literature, the goal towards which the lecturers and tutors are to strive is "to stimulate interest and furnish a preparation for the appreciation and study of literature," the general idea throughout being to "direct and encourage the wider reading of English classics."

There are also alternative courses. For instance, the course for an urban college for women differs from that considered suitable for a country college. One, at least, of the suggestions we find in these specimen curricula is a little utopian. In one place it is stated, "the subjects studied should be chosen as far as possible with reference to what are likely to be the student's special requirements;" and this in face of the fact that the student has, by answering advertisements or by the recommendation of the college authorities, to secure a post where he can. A student may be able to tell in what class of school he would prefer to teach were all conditions equally attractive, but so long as the best salaries are to be obtained under the

large urban school-boards most teachers will prefer to teach in them, if they can manage it; in other words, in face of the competitions of the marketplace it is impossible to tell "what are likely to be the student's special requirements."

To the educationist interested in the welfare of secondary education—and is there one who is not?—there is something saddening about the study of this official publication. How long must we wait for well equipped colleges designed to train secondary-school teachers for their life's work?

CAMBRIDGE CLASSICS.¹

SHILLETO is still a name to conjure with in Cambridge, and few indeed have reached the Classical Tripos without copying some of his versions into their notebooks. It has long been felt that a collection of his work would be well worth making, not only for the old pupils who still cherish his memory, but for all who are interested in fine scholarship. This volume will bear out the high reputation which Shilleto enjoys, and will increase the regret of his admirers that he left so little completed work behind him. At the same time, his work had not the same value in all departments. In Latin verse he has nothing of Calverley's magic, his style is correct, but sometimes prosy or even unnatural. The hexameters have not the vigour and variety of Prof. Jebb's; the lyrics are somewhat disappointing; the elegiacs lack brightness and point. Shilleto is at his best in a description like that from Scott on page 276; the plain style suits him. Of his Latin prose, the most satisfactory pieces are terse and condensed, not exactly Tacitean, yet reminding one more of Tacitus than of Livy. The Latin prose, however, could be equalled by others, and there are who have done better. But Greek is his true province. If Germans in Greek are sadly to seek, Shilleto was not. The iambic versions, despite some obvious faults, are distinguished: if there are rather too many resolved rhythms, if there is some obscurity, there is often the happy phrase, and always the sense of what is possible and what is impossible. Shilleto can be daring:

Great king, within this coffin I present
 Thy buried fear.
*ὄναξ φέριστε, συντεθιμμένον δέος
 τὸ σὸν ἀτέγει τόδ' ἄγγος.*

But is not his daring justified? He has covered a very wide range of subjects in the selections, and his power of expression is equal to them all. Yet he does not succeed in creating a distinct style, or even in imitating the style of one of his models to a nicety. The effect, however, is pleasing, and always dignified. Now and then we feel inclined to

question a detail: as *εἶπὼς κλύει* (p. 31), which ought surely to be *ἦ πως κλύει*; *οὐδ' ἀσκόποις* (p. 13) appears to mean the opposite of what it is meant for; and there are other obscurities in the same piece. The only other Greek metre he attempts is the anapaestic dimeter, which he is apt to make monotonous (the piece on p. 59 is four stanzas of four lines each), but his phrasing is happy enough. But the Greek prose is his glory; and here it is hard to say whether the strong historical pieces after Thucydides, the flowing oratory, or the bright dialogue is more to be praised. His instinct for Greek prose is unerring, his power equal to all difficulties; he has a fine sense of proportion and rhythm, and the tact to seize on essentials and ignore accidents. One of the most striking pieces is a short extract from Bolingbroke which is placed last of all. We may extract one sentence: "Corruption serves to oil the wheels of government, and to render the administration more smooth and easy:" *δωροδοκία καθάπερ τὸ ἐλαιὸν τοῖς τροχοῖς ὄστω καὶ αὐτὴ συμφέροι τῇ πολιτείᾳ ὥστε εὐτροχώτερον καὶ λειότερον προίεναι.* Let him who hesitates about buying read the dialogue on p. 176 between Alciphon and Euphranor, and he will hesitate no longer.

We have nothing but praise for the late Mr. Neil's edition of the "Knights of Aristophanes,"¹ although the editor's death prevented his putting the final touches to his work. Had he lived, he would certainly have enlarged the introduction, which at present is little more than a sketch; and he might have added somewhat to the notes on the latter part of the play. Yet even so this stands alone amongst the editions of Aristophanes for its combination of taste, learning and humour. A German critic who has written on Aristophanes clearly catalogues the qualities which the editor ought to have; and at the end of the list we read, "Fünftens: er muss Spass verstehen." His compatriots as a rule do not "Spass verstehen," ingenious as they are in hunting out parallels; nor do they always understand Greek or the Greek metres as they might. But every page of this commentary shows that Mr. Neil, whilst not neglecting the mint and anise and cummin, had a critical and linguistic acumen which places him in the front rank of scholars. His appendix on the uses of *γῆ*, which reduces that much-abused particle to rule and order, will be a revelation to many; but there are many short notes which bring out a new point in a conclusive manner. He is unerring in his sense of the associations of words, so important and so often neglected. Thus, to take a few examples out of many, he points out that *κακοδαίμων* is playful, "poor devil" (7), suggests that *ἐνθοῦ* was a nursery word (51), explains the artificial connotation of words in—*εὔμα*, (278), distinguishes *κατὰ κύμα*, of gay and confident speed, from *κατ' οὐρον* of carelessness (432). His philological knowledge is also wide and sound, so that he can often correct a mistaken derivation and suggest a new one. He is careful

¹ "Greek and Latin Composition." By Richard Shilleto, M.A. (Cambridge University Press.) 7s. 6d. net.

¹ "The Knights of Aristophanes." Edited by R. A. Neil. (Cambridge University Press.) 10s. net.

to draw attention to the niceties of rhythm, and in another appendix discusses the effect of tragic rhythm in comedy. He gives further many excellent translations, and not a few apposite quotations from English plays. Two points which he touches on in several places are of more than usual importance: the question of the Old Attic dialect and that of Old Attic religion. In studying this play from another point of view, we had noticed the peculiar place taken by Poseidon, as the god of old-fashioned or humble folk; Mr. Neil lays stress on this, pointing out that the oath by Poseidon is especially strong (338), and that he is the Tory god (144, 551) as opposed to the democratic Athena. He also feels a solemnity in the ending of *πεττιγοφόρας* and such words (1331), and notes the "solecism" *εἰ* with the subjunctive (698). Both these subjects might have been well treated at length in appendices; but Mr. Neil had probably not quite realised their meaning. Poseidon was the god of the old inhabitants of Attica, and as such held ground with the great nobles and with the country folk alike; and the "solecism," together with other dialectic usages and forms which are often set down to epic influence, were doubtless again the Old Attic dialect, which was akin to Aeolic, the common source of Attic and epic. We see these preserved in tragedy and common or rustic speech, just as *thou* survives in English for solemn adjurations and on the lips of the peasant. In a few points we must differ from Mr. Neil. If what we have just suggested is true, his note on 698, which commends Cobet's "corrections" of "solecisms," is wrong. We cannot agree with his explanation of *ἄλλε* (1151); or of *εἰ μή . . . γε* in line 185, where the retort seems to be, "Oh, yes, I'm a gentleman if I am not a low-born churl." On 1309 he appears to have missed a point; *Νεοφάντη ἢ Ναισωνος* would suggest such phrases as *Ἀχιλλεῖα Λυσικλέους ἔργον* CIA ii. 793, 38. A few other additions might be suggested, but there is hardly a line one would wish to be taken away.

THREE HISTORICAL SOURCE-BOOKS.¹

THOUGH collections of extracts from historical sources for school use do not appear to have had any conspicuous success in this country, they seem to be in sufficient demand in the States to call for a pretty constant supply.

The three new source-books before us do for constitutional history what the earlier source-books of Professors Colby, Hart, and Kendall do for the political history of this country, and, like them, they are imported from beyond the Atlantic.

¹ (1) "Leading Documents of English History together with Illustrative Material from Contemporary Writers and a Bibliography of the Sources." By G. C. Lee. xvii. + 609 pp. (Bell.) 7s. 6d. net.

(2) "Liberty Documents with Contemporary Exposition and Critical Comments drawn from various Writers." Selected and prepared by Mabel Hill, and edited with an Introduction by A. B. Hart. xxviii. + 458 pp. (Longmans.) 7s. 6d. net.

(3) "Select Documents of English Constitutional History." Edited by G. B. Adams and H. M. Stephens. xviii. + 555 pp. (Macmillan.) 10s. net.

The new trio is not so essential as the old trio for school teachers, because they are more special in their application; but one at least is a desirable possession for all those who recognise that history teaching based entirely on text-books and other secondary matter is bound to be unsatisfactory. We propose to describe the three, taking them in the order of publication, in such a way that our readers may be able to make up their minds which they will order first.

(1) Prof. Lee's volume is in many ways the most ambitious and the least satisfactory. It is a handsome octavo volume, containing not only 235 extracts ranging from Herodotus to the Anglo-Boer Convention of 1884, but also a classified bibliography of the sources which extends to 61 pages and 239 entries. The bill of fare is excellent, but the cooking, we regret to say, is abominable. This is a strong word to use, but it is justified by the facts. There is hardly a page without a mistake of fact or misspelling; and many of these cannot by any stretch of charity be ascribed to the printers. "Woolsey" for "Wolsey," "Invasion of Briton," "Count [for Court] of the Great Mogul," "Inland" for "Ireland"—such misprints are of common occurrence and are often, unlike these, of a kind which might seriously mislead the layman. Unfortunately, the mistakes are most elusive and most dangerous in the bibliography, which is planned on a scale that would make it extremely useful for the elementary student of English History if it were only trustworthy. There is no reason why a small bibliography should not be as sound in its way as the admirable work of Dr. Gross. As for the documents, they are a serviceable but somewhat arbitrary collection, mainly illustrating constitutional history; but they are carelessly transcribed. Messrs. Bell would do well, for their reputation's sake, to issue a full list of *errata* as soon as possible, and to insist that the book should be thoroughly revised. It would then become a valuable addition to our stock of source-books.

(2) Miss Hill's volume, despite its rhetorical and meaningless title, is a sensible and meritorious compilation. It contains about two dozen really "leading documents" of English and American history, including, for instance, King John's *Magna Carta*, *Confirmatio Cartarum*, the Commonwealth Constitutions and the American *Declaration of Independence*; and each is illustrated by both contemporary comment and later criticisms. (Messrs. Longmans will send a full table of contents on application.) The idea is decidedly good from a historical point of view; and the fact that its contents have been actually through the test of school use (at the State Normal School, Lowell, Mass.) should give pause to the scoffer who believes that a sixpenny "Curtis" "will furnish all we need to ask" in history. But the execution is not so good as the presence of Prof. Hart's name on the title-page would lead us to expect. The editors, although they must be acquainted with the windy style of writing so wittily exposed in Seeley's "Political Science," never condescend to explain

what they mean by "liberty"; they cite too many minor authors for their "critical comments"; and in some cases they seem to be very hard pressed for "contemporary exposition"—e.g., when they use Burnet's remarks on the *Abjuration Bill* by way of exposition to the *Act of Settlement, 1701*. Much of the comment, contemporary and later, needs a deal of modification before it can be accepted, and there is a danger lest it should be taken for gospel by the lay teacher. Miss Hill herself is not above suspicion in point of scholarship. "Witanagemot" (p. 423) may be a misprint, but the statement that "William III.'s only son" died in 1701 cannot be ascribed to the printer: In fact, the introductions to each chapter abound in statements which are not merely debatable, but demonstrably wrong. The general design, the texts, and the short bibliography are all good; but the book as a whole is not quite worthy of its beautiful printer's and binder's work.

(3) Messrs. Adams and Stephens have produced a thoroughly sound and serviceable book, which has long been needed. It contains 276 documents illustrating English constitutional history from 1080 to 1885; these are well selected, carefully printed, and provide, in a single handy volume, all that any but advanced students need have before them. It is every way more suitable for upper forms of schools and for pass candidates at the Universities and for general class teachers than the longer and more minute collections of documents edited by Doctors Stubbs, Prothero, and Gardiner for the Oxford Press; and we hope that conservatism and vested interests will not long delay its formal adoption by those who are responsible for pass-degree syllabuses in History. But—for here also there's a "but"—the book is preposterously dear at 10s. net; and there should be an index, if not an introduction and a bibliography.

It should be added that each of these books contains a first-rate table of contents, and that in each book the documents which were originally Latin or French are here translated. The first two books also contain fair indexes, and all are well printed and strongly bound.

DEPARTMENTAL ADVICE TO TEACHERS.

THE Board of Education has published recently a number of reports and suggestions as to methods of teaching which ought not to be overlooked, for these publications contain some useful hints and opinions which, if teachers could be persuaded to assimilate them, would have considerable influence on the work of instruction. To make this easily possible we have selected a few passages referring to subjects of wide educational interest, and they are here reprinted. It is often stated that nothing which is said of teaching in public elementary schools can be of assistance to those whose work lies in the secondary school, but we do not agree with this view. Young children, whatever the social status of their parents, always set about the business of learning in much the same way. What His Majesty's Inspectors find true of the elementary school represents approximately what is

true of the lower parts of secondary schools. The student of education should therefore give consideration to educational work of all kinds, and judge their merits in the light of his own experience.

The first selections are from the "Revised Instructions applicable to the Code of 1901." It is there insisted upon that the nature and scope of the instruction which should be given in all schools should have in view the co-ordination of the whole of the school work. All the instructions have been drawn up to give more freedom of initiative to individual managers and teachers, and to secure a more complete adaptation of the instruction to local requirements.

An Annual Plan of Work.

At the beginning of each year there must be provided a plan of the work to be done in that year, which should set out, in outline, schemes of work in the different subjects. But if it is necessary in the interests of the scholars, the teacher is at liberty to deviate from any scheme either in the way of omission or enlargement or curtailment of its various parts. There should also be provided note-books for containing brief summaries of the chief oral lessons, a record book in which the head teacher may make brief entries showing the quality of work done throughout the school as tested by periodical examinations, and progress or mark books as to the individual conduct, application, and advance of the scholars. All these documents are the property of the managers, and in case of a change of teacher should be left at the school. It may be useful that some short record of the conduct of each scholar should be sent to the parents annually. But such records should not hamper a teacher in varying the work of the school, nor be so detailed as to demand an undue amount of clerical work.

The Objects and Scope of Instruction.

The object of the course of instruction is to convey information to the minds of children, and still more to stimulate them to acquire knowledge for themselves. To this end all lessons should be directed, and not merely the "object" lessons which are sometimes supposed to be the only effective method of attaining it.

Hitherto the course of instruction to be followed in all schools has been prescribed in minute detail, and practically little variety, even of method, was attempted by any teacher. In future, teachers must consider for themselves what shall be the scope of their instruction and what are the best methods to pursue. They may, if they choose, deviate little from the routine which has become a second nature, or they may introduce innovations both numerous and various. But whether they adopt either of these extreme courses or a judicious modification of both of them, they must remember that the responsibility is theirs.

The Inspector will judge the success of the instruction by noticing the conduct of the children during their ordinary lessons, whether the attention is keen or languid, whether the children are careful and industrious or idle or slovenly. He may put a few simple questions on the subject of the lesson and also on other parts of the school work. The exercise books, the records of previous examinations, and the papers worked by the children and revised by the teacher, will afford further material for forming an opinion. The Inspector may also give valuable help to the teacher in this way; for frequently small errors of various kinds strike a fresh observer though they escape the notice of the teacher, the keenness of whose apprehension may be somewhat blunted by familiarity.

The intelligence of the instruction depends on the method, and as methods aim at a certain end, the entire removal of the official examination which was once a determining factor in the

scheme of instruction will induce teachers to consider whether some change of method should be introduced. First, the children may be taught less and learn more, *i.e.*, the teacher should endeavour to make the children observe and infer for themselves, and should be less anxious to convey to their minds ready-made information. Progress may be slow, but it will be real and permanent, and the children will know how to gain information for themselves. Next, their memories should not be burdened excessively. Children learn by rote with great ease and imitate readily; the teacher, whilst making good use of this faculty, should endeavour to train the children not to commit words and phrases to memory without thinking of the meaning of what they repeat: he should train them not to learn mere strings of isolated facts but to notice the connection of one fact with another.

Discipline and Organisation.

The most effective agent for maintaining good discipline is the teacher's own example. Children readily recognise that their teachers are anxious to help them, patient, but yet determined to be obeyed. They notice also such details in their conduct as punctuality, order, neatness, gentle speech, and imitate what they see and hear. They observe little defects of conduct more keenly still, and with disastrous effect. It is on this account, therefore, that great stress is laid on matters that appear to be unimportant. The punctual, methodical performance of all the duties of the day, however trifling they may seem, is the result of good habits on the part of the teacher and the foundation of good habits in the scholars. If discipline were perfectly efficient, punishment would be unknown, for the result of efficient discipline is to engender the good habits which render punishment unnecessary. Order, diligence and obedience, which are only maintained by frequent punishment or the dread of it, do not constitute good discipline. Indeed, the infliction of punishment is, to some extent, a confession of defeat by the authority that inflicts it; for the object of discipline is to prevent the commission of faults. No punishment which excites the emotion of terror in a child should ever be employed. In an infants' school no punishment should be permitted which causes bodily pain. In schools for older children, corporal punishment should be discouraged as an ordinary expedient in boys' schools, and altogether in girls' schools. The punishment register, which is required in all schools, may serve some good purpose if it induces teachers to reflect occasionally on their methods, and to consider whether these really tend to the formation of the habit of good conduct.

The organisation of a school is good if the scholars are properly distributed, and if the teachers are qualified to undertake the special work prescribed for them in the scheme of instruction. In large schools the organisation is generally effective. In these the whole of the instruction in each class is generally assigned to one teacher, but some variation in this practice may be suggested. Teachers are not interested in all subjects alike, and therefore the work of the school may be distributed among the staff so as to assign the instruction in certain subjects to those teachers who have special knowledge of them. Subjects like mathematics (including arithmetic), the science of common things, literature, cannot be taught effectively by teachers who have merely a superficial knowledge of them.

The Teaching of Composition.

We have also before us a number of general reports by His Majesty's Chief Inspectors for different districts of England. In addition to detailed information as to educational progress in the parts of the country with which the reports are concerned

there are many conclusions as to the proper methods of teaching a variety of school subjects, arrived at by the inspectors after examining the work of a large number of schools. Reporting on the instruction in the north-central division of England, Mr. J. G. Fitzmaurice puts on record what Mr. Joad, the Inspector of Wolverhampton, says about the teaching of composition:

Composition is probably the most difficult of all the subjects taught in an elementary school. The youthful age of the children, the poverty of their vocabulary and their ideas, their small literary experience, and, above all, the fact that they hear so little correct English spoken at home, will always be obstacles in the way of good results in this subject. Moreover, the rules for writing good composition, other than those which relate to the syntax of the individual sentence, are necessarily somewhat vague, whilst rules for teaching others to write it appear to be almost non-existent.

It is by no means necessarily the case that commonplace subjects such as, "How I spent my last half-holiday," or "Describe the policeman's life," or "The town you live in," are the best for this purpose. They are wanting in interest for the children, and are often very hard to write about well. Subjects upon which the teacher can give the children interesting information, and can arrange that information under suitable heads, will give better results both from the point of view of good composition, and also as enlarging the general information and intelligence of the children. In the case of letter writing, the subject should be personal, and not academic or scientific in character. Circumstances should be imagined and statements made about them such as would be likely to call for the writing of a letter. It is manifestly absurd to write a letter beginning, "Dear mother, iron is a mineral and is dug out of the earth," and ending, "Saucepans and pokers are made of iron. I remain your affectionate son, &c." Yet the children are not infrequently required to do this, to teach them the "letter form," as it is said. The compositions, as finally presented, should neither be a mere list of haphazard, unconnected jottings, nor, though the ideas are the same, should they be expressed *verbatim* alike by every child. Both of these faults are common: the one shows too little teaching, and the other too much, leaving the children little scope for practising the formation of their own sentences.

Elementary Subjects.

A number of hints on the teaching of elementary subjects included in Mr. W. E. Currey's report for the eastern division of England, which were supplied to him by Mr. Wix, one of the inspectors in his district, are worth reprinting:—

In *reading*, is simultaneous work judiciously and sparingly used with a due appreciation of its disadvantages and dangers? Is sufficient time given to this most important of all subjects, so that after the initial difficulties have been overcome the children may go on to acquire habitual ease in reading, and so find out that what they at first thought an irksome task is the most delightful of all recreations?

Are children encouraged first to phrase naturally and spontaneously, in accordance with their notions of the meaning? Is "pattern" reading used only when necessary, and is the passage patterned by the teacher gradually increased in length according to the age of the scholars? Is explanation confined to detached scraps of knowledge and isolated "meanings," or is it first directed to the whole meaning of the passage, so as to make children see that they can really learn something from reading, and so give them a love for it? Is a child told a difficult word at once, or encouraged and trained to face a difficulty for himself? If "silent" reading is used, is the teacher careful to question on it and ascertain its result?

Is *writing* really *taught*, or is it used merely as a means of employing a class which the teacher is too busy to attend to?

Is *spelling* taught by means of several methods in combination, by spelling rules, word-building, and dictation, and by appeal to the eye as well as to the ear?

This subject is the most difficult of all to test by inspection; there is often too much reliance on word-building, there is certainly too much laborious learning of isolated words. When a rule is taught—and to some extent even English spelling can be reduced to rule—the words used to illustrate it, or words of similar formation, should be embodied in a piece of dictation, so that children learn to write words correctly in their ordinary combinations with *dissimilar* words, combinations such as they meet with in daily life. Teachers, as a rule, are thoroughly alive to the insufficiency of word-building by itself, and in some schools, even in some infants' schools, children are encouraged to put every word they learn into a sentence of their own—a most useful exercise for more purposes than spelling.

In *arithmetic* is the proportion between teaching and practice duly observed? Do the elder children work too much from cards? Is sufficient time given in fresh lessons to explanation of principles and in lessons of recapitulation to careful correction and blackboard exposition of errors, not a mere hurried entry of "R" or "W" opposite a sum in the last five minutes of the lesson, a method of marking which can of itself teach a child nothing and often leaves copying undetected?

Are the lessons finished in the allotted time, so that the point is driven home and not left half explained? Are the children helped too much, or are they allowed to work the elementary processes for themselves, and so trained by constant practice to habitual rapidity and accuracy of calculation?

Are the sums set duly varied in character or all in the same groove? Are the children set from the beginning to work long abstract sums of which they do not understand even the notation, or is a new rule introduced by a carefully graduated and progressive series of simple *concrete* sums, leading by degrees to the longer abstract sums which may be necessary to secure accuracy?

Nature Knowledge.

It is not surprising to learn from the report of Mr. J. A. Willis, the Chief Inspector for the south-western division of England, that the attempts to introduce really scientific lessons on common natural objects into rural elementary schools have not been altogether successful. Of the nature of the difficulties in the way and the extent to which they have been overcome, Mr. Willis says:—

I should be sorry to seem to undervalue the conscientious work of the great body of rural teachers, who are teaching according to the light which they have received; but the facts remain that the work of the Inspector in this particular matter has not been very fruitful: he has been expected to act as a sort of ambulant training college among teachers of mature years, of fixed habits of thought, and sometimes of insufficient knowledge of their own shortcomings; his text has been, if not to worship what they have burned, at any rate to burn what they have hitherto worshipped—to put aside their idols in the shape of pictures and fragments of material stuck on cards, as to which they have some letterpress to guide them, and turn to humbler realities for which they must depend on their own common sense; to omit the Cheetah, the Springbok, the Cassowary, and the Apteryx, in favour of a set of subjects maddening from their very simplicity, and to frame a syllabus with an "educational" purpose, while they are guiltless of any but that of satisfying the Inspector. In very truth, there is not only reason but necessity for "going slow."

COUNTY COUNCIL SCHOLARSHIPS.

THE National Association for the promotion of Technical and Secondary Education has made a third inquiry into the scholarship schemes of English County and County Borough Councils. The information collected on the two previous occasions referred to the provision of scholarships during the financial years 1893-4 and 1894-5, while the present report is concerned with the year 1899-1900. The particulars brought together during the most recent investigation are much more exhaustive than in the former cases. A full account of the conclusions to which the present return has led is published in the *Record* of the National Association, and the following particulars have been derived from it:—

The Scope of the Inquiry.

The present return was drafted in seven sections, viz., scholarships in:—(1) evening technical and science and art classes; (2) technical schools and science and art schools; (3) secondary (not agricultural) schools (including grammar and other endowed schools, schools of science, and higher-grade board schools); (4) universities and institutions of university rank (not agricultural); (5) agricultural and horticultural schools and colleges (including both migratory and fixed dairy schools and institutes, and secondary schools and higher institutions with agricultural departments or sides); (6) domestic economy schools or centres (including those for cookery, nursing, ambulance, hygiene, &c.); (7) courses for elementary teachers (including those in foreign countries). The return was intended to cover scholarships continued automatically from previous years, as well as those renewed or specially extended, in order that a statement of all the scholarships in force might be presented. It is to be feared, however, that this object of the return has not been fully grasped by all the officials of local authorities.

The information given does not, in every case, necessarily represent all the scholarships that are offered, though it may all those that are in force. Certain scholarships may not have been awarded in the particular year dealt with by the return.

In regard to elementary and other teachers especially, the method of assistance renders the task of tabulation difficult. This is so on account of the number of local authorities who assist the training of teachers by simply paying their fares or fees, or both, involved by attendance at recognised centres, or by directly establishing training classes or centres themselves. Both these forms of aid act in the same way and effect the same results as the award of scholarships or exhibitions would do; yet it was impossible to present the facts in an appropriate style in the present return. Again, small scholarships and free studentships are sometimes provided by urban councils or local committees from funds allocated to them by county councils, and, in a much smaller degree, such bodies augment the scholarships granted to their students by the county councils. But all such scholarships or additional aid have been strictly excluded from the return. On the other hand, the value of free tuition, both in municipal and other institutions, has been, as far as possible, included in the stated value of the scholarships. This has been done as local authorities pay, in one form or another, the fees of scholars in voluntary institutions, even if no grant for maintenance is given, or provide the means for giving the tuition in their own institutions.

Higher Technical Instruction.

The return brings out clearly one very grave defect in the scholarship schemes of the different councils. We cannot do better than quote the report: "The provision of facilities for the passage of students from technical schools to higher colleges

or universities is distinctly faulty; in fact, it does not even exist in many localities, while in others the only means available is by Government scholarships and exhibitions, supplemented in some cases by local funds or private means."

Until a really determined effort is made to give the best of the students in ordinary technical classes an opportunity of studying the higher branches of applied science under proper conditions it is useless to think of competing with German and American manufacturers on equal terms

Summary.

There are at present only three county councils in England who do not provide scholarships and exhibitions of any kind. These are Huntingdonshire, Rutland and Soke of Peterborough; but neither of them do all that is possible for technical education, inasmuch as they divert part of their shares of the Residue Grant to relieve the rates. Two county councils have actually created or started scholarship schemes since the year 1894-5. These are Cornwall and the Isle of Ely.

With regard to the county borough councils, 14 out of a total of 61 do not yet directly provide scholarships. These are Barrow, Birkenhead, Bury, Coventry, Croydon, Exeter, Gateshead, Hastings, Huddersfield, Ipswich, Leeds, Lincoln, Sunderland, Wigan.

In at least six of these towns, however, provision for this kind of assistance to students will soon be, or is otherwise, made, and wholly or partly meets local requirements. In Bury a number of small scholarships and studentships tenable at the technical school are founded by private means. In Huddersfield, about 45 scholarships, varying in value from the cost of free tuition to a sum of £50, are attached to the institutions receiving money grants from the Corporation, but there is no cohesive scheme in operation. In Leeds scholarships are established in a similar way. In Ipswich an attempt was made to start a full scheme of scholarships for the working classes, but the competition was so small that the scheme was held in abeyance. It is probable that a scholarship scheme will soon be drafted for Lincoln. Wigan can almost be classed as possessing an efficient scheme; one of the terms of the special joint arrangement that has existed for years with the Lancashire County Council in respect of the local mining and technical college is that residents in Wigan are eligible to compete for all the county scholarships and exhibitions offered.

Taking county and county borough councils together, there are now 93 out of 110 such local authorities who provide scholarships in one form or another; this represents an advance of 23 authorities over the year 1894-5. The total number and value of the scholarships and exhibitions in force under the schemes of 90 of those 93 authorities during the year 1899-1900 were 19,971 and £156,793 respectively: these figures represent respectively a *net* increase over 1894-5 of 8,302 scholarships and exhibitions, and of £62,578 expended upon them. The following table summarises the particulars respecting each type of scholarship:—

SCHOLARSHIPS IN FORCE DURING THE YEAR 1899-1900.

	No. of Councils.	No. of Scholarships.	Total Annual Value.
(1) At Evening Classes	38	6,766	7,862
(2) At Technical and Science and Art Schools	39	3,426	17,064
(3) At Secondary Schools	56	5,593	77,349
(4) At Higher Institutions and Universities	50	679	27,097
(5) At Agricultural and Horticultural Schools, &c.	40	532	9,866
(6) At Domestic Science Schools, &c. .. .	31	1,349	12,199
(7) For Elementary Teachers	29	1,626	5,356
No. of individual Councils: 90.		19,971	£156,793

The necessity for giving definite power to local authorities to enable them to recognise institutions situate outside their districts as places of tenure for their scholarships was made manifest soon after the passing of the Local Taxation (Customs and Excise) Act, 1890. The necessity was fully met by the enabling Clause 1 (b) of the Technical Instruction Act, 1891. By that clause local authorities were empowered to provide or assist in providing scholarships for or pay or assist in paying the fees of students ordinarily resident in their districts at schools or institutions outside those districts. The value of the Clause, to the county councils at any rate, is clearly substantiated by the information furnished by the present return. The following is a list of the number of county councils who *definitely* allow the various types of scholarships to be held at outside institutions:—

	Scholarships at	Councils providing such scholarships.
Evening Classes and Technical and Science and Art Schools	12 out of 18
Secondary Schools	19 " 40
Higher Institutions	31 " 33
Agricultural and Dairy Institutes	31 " 40
Domestic Science Schools	20 " 28
For Elementary and other Teachers	13 " 27

These facts by no means exhaust the large amount of information concerning the national supply of scholarships which this valuable report contains. We recommend any one who is interested in the history of English education to procure a copy of the July, 1901, number of the *Record* for future reference.

THE SCHOOL PULPIT.

Leaving Home.

By the Rev. W. J. FOXELL, M.A. (Lond.),
Minor Canon of Canterbury Cathedral.
Author of "God's Garden," "Sunday Talks with Boys,"
"In a Plain Path," &c.

HAS it not sometimes happened to you in the ramblings of a summer holiday to have climbed a hill, and to look back over the long steep path you have trodden, down into the distant valley from whence you started? How different does that world down there now appear! The road, which was then wide enough for two carriages to run abreast, now looks like a little garden-path: the long, straggling, village street, which took you a good five minutes to walk through, lies there with all its cottages and houses huddled together apparently within a few yards of one another: the village church itself seems no larger than a toy. Some things you cannot now see at all, the turn in the hill has hidden them; and other things, how different! Which is the true view? Is it the near, or the distant? There is more philosophy in that question than you or I have time to discuss now; but this much is certain: things *are* what our point of view makes them; and distance has a great power of enchantment. Distance is your true magician.

It is with time as with space. Life, too, has its atmosphere and perspective: like nature, it rarely shows a hard line at a distance. Time idealizes our childhood. Wordsworth, in dreamy Platonist mood, thought of life as a journey, in which as years go on we travel farther and farther from that heaven which "lies about us in our infancy":—

Shades of the prison house begin to close
Upon the growing Boy,
But he beholds the light and whence it flows
He sees it in his joy; .

The youth who daily farther from the east
Must travel, still is Nature's priest,
And by the vision splendid
Is on his way attended ;
At length the Man perceives it die away,
And fade into the light of common day.

Such was Wordsworth's conception of life. Infancy—childhood—was a Paradise lost; a fair Garden of Eden, where the soul walked with God in the cool of the day, before it was driven forth into the hard, matter-of-fact world of men. This is why the poet could say:—

The thought of our past years in me doth breed
Perpetual benediction.

It is always so with him whose boyhood was happy.

But boyhood has its sorrows too; scars of wounds which it will carry to the grave. In many cases time, the great healer, has softened their sharp outline; and the grown man has ere this cast over those early griefs a halo of rich sentiment—the luxury of self-pity. Still, truth it is that there are some sorrows of boyhood which, whenever they come back to memory, are fresh and poignant as in the day when first their bitterness was felt. They are not so much scars as open wounds. I am thinking of that wrench to the young heart when home is left and school life begun. What trial a man ever had to endure in after-life was more cruel than that pang? Then for the first time he really learnt that life in the world meant separation from father and mother, and all the delights and happy licenses of home. Then for the first time he felt that he had been shoved forward to fight, as men fight, in the front rank; that he had to fend for himself.

Scientific men tell us that life is easy and happy in proportion as the organism is in harmony or correspondence with its environment. A young boy, who has left home and is suddenly planted down amongst scores, or perhaps hundreds of boys at school, is a creature transported to a new environment. He has to learn to adapt himself to new conditions, and the process of adaptation is painful in proportion as it is slow. What a sense not so much of solitude as of blankness oppresses a "new" boy of sensitive feelings! A man suddenly waking up in the planet Mars could not be more bewildered. What are the inhabitants of this new world, what are their laws, their customs, what even their language, are questions which he has to solve. Everything is so different from the familiar little world of home.

Macaulay, "the sensitive, home-loving boy," felt keenly leaving home. We learn from Trevelyan, his biographer, that the commencement of his second half-year at school, "perhaps the darkest season of a boy's existence, was marked by an unusually severe and prolonged attack of home-sickness." Trevelyan considerably suppresses young Macaulay's first letter, written from school after the summer holidays; but the next letter—which he gives—"is melancholy enough." The boy, who was then not quite thirteen, in writing to his mother, "You told me," he says, "I should be happy when I once came here; but not an hour passes in which I do not shed tears at thinking of home . . . there is nothing which I would not give for one instant's sight of home . . . that home which absence renders still dearer to me."

The late Lord Shaftesbury's boyhood was co-temporaneous with Macaulay's: the great philanthropist was but six months younger than the famous historian; and while the latter was at the private school kept by the Rev. Mr. Preston, at Shelford, the former was at Harrow. But at Harrow young Ashley was happy; the time of acute misery was past and gone. When only seven he had been sent to Manor House, Chiswick, a preparatory school, whose master was the Rev. Dr. Thomas Horne. Here he suffered exquisite misery for five years. "Even in old age," we read in his "Life," "he would say: 'The memory

of that place makes me shudder; it is repulsive to me even now.'" His wretchedness, however, was not due in any way to the loss of home joys; for home, for him, did not mean what it means for most boys; for him it had none of the tender associations which it had for Macaulay. "His heart sank within him when the day came for him to go home for the holidays, and it sank within him when he had to return to school." At school he was underfed by the master, and bullied by the elder boys; at home he was neglected by his parents, and starved by the servants.

Young boys of the present generation may well be glad that their lot is happier than it would have been had they lived in bygone days. To leave home was, except in rare cases, misery enough; to be like a fish cast on dry land was bad enough; but when to these evils was added something akin to the terrors of the Spanish Inquisition, it is not a matter of wonder that many a man preserved a dismal memory of the proverbial "happiest time of his life." "No one who knew Lord Shaftesbury," his biographer tells us, "could fail to observe in him an air of melancholy, a certain sornbreness and sadness, which habitually surrounded him like an atmosphere." This, we are told, was largely due to the fact (among other causes) that "there had been no lightheartedness in his childhood, and that the days to which most men look back with the keenest delight were only recalled by him with a shrinking sense of horror." In due time the boy grew to be a man, and to have sons of his own. It is interesting to read the entry in his diary the day before his eldest son, Antony—then a boy of twelve—was to leave home for school. "During many years I have passed every morning with him, hearing and reading the word of God. I cannot bear to part from him. . . . It seems to me almost incredible that I am about to surrender my Reuben to the care of a stranger! . . . All will now be left to a 'hireling': will he care for the sheep?" In truth an anxious, loving father! He who himself had suffered so keenly as a boy is full of a tender-hearted sympathy for his own boy.

Everybody knows the timid, sensitive, gentle character of the poet Cowper. Who can tell how much of the morbid depression of the poet's later years was caused by the persecutions he had suffered when a boy at Dr. Pitman's, and afterwards at Westminster? He was a tender and delicate child, devotedly attached to his mother, who died when he was six years old, and whose memory he cherished all his life long with a fervour that was almost a religion. He was, from the first, physically and mentally unfit to stand the strain of public-school life. Often in later years he used to allude to the sorrows of his boyhood, with all its cruelties and persecutions. He said that when he was at Westminster he dared not raise his eye above the shoe-buckle of the elder boys, and that he could hardly describe the wretchedness of those days without a shudder.

So Lamb speaks of "the tyranny of the monitors" of Christ's Hospital. Nearly fifty years separated the boyhood of Charles Lamb from that of Cowper; but the tale is the same. "The oppressions of these young brutes are heart-sickening to call to recollection." Thus Elia: "I have been called out of my bed, and *waked for the purpose*, in the coldest winter nights—and this not once, but night after night—in my shirt, to receive the discipline of a leathern thong." He tells of one "petty Nero" who "actually branded a boy, who had offended him, with a red-hot iron."

Well, thank God, times are changed, and the "good old days" are past. There is less senseless brutality in school-life, there is more tenderness, if not more love, in the home-life. If on the one hand there is more to endear a boy to his home, there is less, far less, to make school a purgatory. Still, leaving home must be a painful wrench for a young and affectionate boy. Nevertheless it is oftentimes necessary for the

development and bracing of character. *Pathemata mathemata*, runs the old Greek jingle; and it is the law of our humanity that only by the discipline of pain—so long as the pain is not crushing and destructive of moral fibre—we can learn the highest lessons of life. It is through much tribulation that we enter in; and although, here and there, there will always be a boy whose nature is unfit for the stress of school-life away from home, and will flourish best under his father's roof, yet, for all but these few, leaving home and going to a good school is best. No doubt it is painful for the father to say—as it is for the son to hear him say—

My boy, the unwelcome hour is come
When thou, transplanted from thy genial home,
Must find a colder soil and bleaker air,
And trust for safety to a stranger's care.

But, as John Stuart Mill said, "It is difficulties, not facilities, that nourish bodily and mental energy." The soil may be cold, the air bleak; but such conditions are just those most favourable to the production of independence, self-reliance, promptitude, and true manliness. Let but the boy remain faithful to the teachings and traditions of a good home, a little weeping will not matter. He that soweth in tears shall reap in joy.

ITEMS OF INTEREST.

GENERAL.

MISTRESSES in girls' schools and all teachers in mixed schools who are willing to assist an important scientific investigation should read the letter which Prof. Karl Pearson contributes to our correspondence columns this month. Prof. Pearson is a leader in the school of biologists that approaches problems of evolution from the statistical side, and it is an honour to be associated with him in the work he has in hand. He had already obtained from teachers in schools of various grades the particulars he requires as to the physical and mental characteristics of more than a thousand pairs of brothers. The discussion of the material thus obtained has led to the following definite conclusion, communicated to the Royal Society on November 21st:—"That the mental characters in man are inherited in precisely the same manner as the physical. Our mental and moral nature is, quite as much as our physical nature, the outcome of hereditary factors." What Prof. Pearson now requires are observations of the characteristics of pairs of sisters, or of brothers and sisters; and any of our readers who are prepared to undertake the simple measurements necessary for the purpose of comparison should communicate with Prof. Pearson at University College, London. The measurements and observations required are very simple, and can be made by teachers unfamiliar with scientific work, as well as by science-masters and mistresses. We trust that there will be a wide and ready response to Prof. Pearson's request for help; for we should not like it to be said that the investigation could not be completed satisfactorily because of the indifference of teachers to the subject of mental and physical characters of their pupils.

DR. H. E. ARMSTRONG, F.R.S., will be the president of the Educational Section of the British Association at the meeting to be held in Belfast on September 10-17th, 1902.

REPLYING to a letter of Sir John Hibbert, expressing a fear that the schemes made by Education Committees to be constituted under the Education Bill of last session might operate to the detriment of non-local schools, the Duke of Devonshire points out that it "was not the intention of the framers of the Bill to confer on any local education authority,

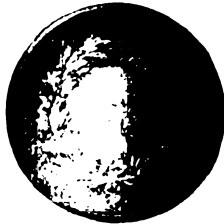
by scheme or otherwise, any power of exercising control over or interfering with the affairs of any school, except those established, maintained, or aided by the authority. In case of aid, a local authority would of course have power to attach conditions to the aid, but a school which did not receive aid would remain independent. This was the intention of the Bill, and I am advised that this was its effect." His Grace goes on to add: "I understand, however, that the governors of several of the non-local schools share the alarm expressed by the governing body of Shrewsbury School, and I should therefore be much obliged if you would kindly have this correspondence published. I will do my best to see that any doubt on this point is removed in any Bill for the same purpose which may be brought forward next Session."

THE great success which attended the conferences of science teachers held during the Christmas vacations of recent years has encouraged the London Technical Education Board to arrange another conference, which it is hoped will be attended by a very large number of teachers from elementary and secondary schools and technical institutes. The conference will be held on Thursday, January 9th, and Friday, January 10th, 1902, at the South-Western Polytechnic, Manresa Road, Chelsea, S.W. At the first meeting the chair will be taken by Mr. T. A. Organ. Addresses will be delivered by Miss Alice Ravenhill on the "Teaching of Hygiene," and by Dr. Francis Warner on "Mental School Hygiene." The chairman of the second meeting will be Sir Henry E. Roscoe, F.R.S. Addresses will be delivered by Mr. Frank E. Beddard, F.R.S., on the "Teaching of Natural History," and by Professor W. B. Bottomley on the "Value of Natural History Collections for Teaching Purposes." Professor A. W. Rücker, F.R.S., Principal of the University of London, will take the chair at the morning meeting on Friday, January 10th. Addresses will be delivered by Mr. R. Hedger-Wallace on "American Systems of Nature Study," and by Mr. D. Houston on "Nature Study in Schools." At the fourth meeting the Countess of Warwick will take the chair, and addresses will be delivered by Mr. E. E. Hennesey on "Technical Education in Rural Secondary Schools," and by Prof. R. Meldola, F.R.S., on "Pioneer Work in Secondary and Technical Education in Rural Districts." A collection of home-made apparatus for science teaching in schools will be on view during the days of the conference. The assistance of teachers who have designed such apparatus is specially desired, in order to make this section of the work as useful as possible. Packages of apparatus should be sent to Mr. H. B. Harper, at the South-Western Polytechnic, not later than Saturday, January 4th. Free admissions will be granted to as many teachers as the conference room will accommodate. Applications for tickets of admission should be made to Dr. Kimmins, Park Lodge, Harrow-on-the-Hill, or to Mr. C. A. Buckmaster, 16, Heathfield Road, Mill Hill Park, W.

WE are glad to note that the Civil Service Commissioners did not set the same type of French paper for admission to the Army last month. As our readers will remember, we protested last August against the dialogue pieces that have been set at the last three or four examinations; for they were not a fair test of a student's knowledge. This time a piece of verse and a piece of prose on *La Fontaine* were given to be translated into English, and the description of Cromwell's death from Green's "Short History" to be translated into French. The miscellaneous questions still leave much to be desired. If the Commissioners desire historical grammar to be learnt seriously, why do they not ask questions involving principles, and not derivations of words that the candidate may or may not have met?—*e.g.*, "Give the derivation of: *lôt, encore, désor-mais, chaise, dentée, lièvre, trou, heur, méchant, ennuyer.*"

There were no questions on French history, and the only two on literature were:—"State what you know of one of the following: *Balsac, L'hôtel de Rambouillet, La Fontaine, André Chénier.*" And: "Give the authors of the following works: *Les Plaideurs, Horace, Les Précieuses ridicules, Le Lutrin, Les Lettres persanes, Paul et Virginie, Le Barbier de Séville.*" Why do not the Commissioners imitate the University of London at the Intermediate Arts Examination, and give one author to be learnt thoroughly each time, and not favour cram by skipping over the whole field of French literature?

LORD TENNYSON, the Governor of South Australia, has given, and has arranged to give annually, a gold, a silver, and a bronze medal, to be competed for by all the schools in South Australia, for the best set of answers in English literature in the lower, middle, and upper examinations held by the University



of Adelaide. We have been permitted to examine one of the medals, and have much pleasure in giving our readers an idea of its appearance by means of the accompanying reproduction in natural size. The head of the late Poet Laureate is shown in remarkably fine relief.

MANY teachers of geography will be glad to learn that lantern slides, illustrating Tasmania, can be loaned from the Office of the Agent-General for Tasmania, 5, Victoria Street, London, S.W. The slides are made up in complete sets of fifty each, and with each set a pamphlet is sent to assist the teacher in describing the country. The only cost to the borrower is the carriage on returning the slides. As some difficulty has been experienced in the past in allotting dates convenient to the applicants, it is requested that when making application applicants shall give as many dates as possible.

MR. ASQUITH, addressing a meeting at Oldham, on November 23rd, begged his hearers "not to be led astray by the captivating and fascinating cry of a single authority for all educational purposes." The composition and structure of local authorities will have to vary, Mr. Asquith thinks, according to the requirements of different localities and circumstances. It is possible to admit this and still to desire the single authority. Educationists as a body may be said to be agreed on the question of the desirability of a single authority for each district, and it is to be hoped that it will be the ideal towards which all politicians will work. The exigencies of practical politics may make it impossible to accomplish it at a single step, but there is no reason why the probable legislation of next session should not bring us substantially nearer to the "fascinating and captivating" end. The important matter is, Mr. Asquith rightly maintains—"the thing to get placed within reach of the people of this country is a regular, graduated scale from the bottom to the top, those means of developing their intellectual powers, of acquiring a specialised knowledge upon the foundation of a general education to carry on the great competition with the rest of the world." In other words, "Organise your secondary education"; and the most effectual way to do this seems to be to get good single local authorities to look after all grades of education.

WE have on previous occasions called attention to the admirable work of the Pupil Teachers' University Scholarship Committee, of which the Rev. Canon Barnett, Warden of Toynbee Hall, is the chairman. The ninth annual report of the Committee, now published, shows that the excellence of the scheme is being well maintained. The students sent to Oxford and Cambridge by the Committee have gained a higher proportion of honours than that of an ordinary public school. Out of thirteen men at Cambridge, ten have won sizarships or exhibitions which have enabled them to become members of colleges; while at Oxford, of fifteen Toynbee scholars, four are exhibitioners and four commoners of various colleges. At Cambridge two students in their fourth year and three in the third appeared in the Tripos lists. There is an increasing demand for the scholarships, and this year there is promise of a very large field of candidates. The Committee hopes that the funds at its disposal may make it possible to send up all who are worthy. An appeal is made, therefore, to those who are interested in the scheme to send a donation to the treasurer of the fund, the Rev. Canon Barnett, Toynbee Hall, Whitechapel, and to use their influence with the Treasury to increase the grant to pupil teachers going to reside at Oxford or Cambridge.

IN connection with the courses of lectures established by the London Chamber of Commerce on the Machinery of Business, Col. H. M. Hozier, C.B., Secretary of Lloyds, has during December delivered two lectures on the "Insurance and Machinery of Lloyds." Mr. Charles Duguid, Financial Editor of the *Westminster Gazette*, will lecture on "How to Read the Money Article," on Thursdays, the 13th and 20th of February, 1902, at 6.30 p.m. Mr. C. Rozenraad will lecture at the same hour on the 20th and 27th of March, 1902, on "Foreign Exchanges." Admission to the lectures will be by ticket only. Students in the lectures and classes held at the offices of the London Chamber of Commerce will be admitted to the above lectures free of charge. Others desirous of attending these lectures should apply for tickets of admission to the manager of the Educational Department of the London Chamber of Commerce, 10, Eastcheap, E.C.

LORD REAY, Chairman of the London School Board, opened a new pupil teachers' school at Offord Road, Barnsbury, on December 7th. During the course of his address Lord Reay dealt with the future training of pupil teachers, and said he should like to see their whole time devoted to training, and the name of pupil teacher disappear from the Code. Unless the greater part of the pupil teacher's time is devoted to his own training, the result is damaging to himself and to the school in which he is employed. Sir Joshua Fitch, who seconded a vote of thanks to Lord Reay, does not, on the other hand, look forward to the abolition of the pupil teacher, and considers the apprenticeship system, under which the pupil teacher works, a perfectly sound one. Probably the wisest course for some time will be to give the young teacher sufficient time to become familiar with the art of teaching while ensuring him every opportunity to secure a good general education for himself.

THE lectures to be given next term in connection with the Oxford School of Geography will be of a varied and interesting kind. The Reader, Mr. Mackinder, will lecture weekly on "The Historical Geography of Europe." The Lecturer in Physical Geography, Mr. Dickson, promises weekly lectures on "Map Projections," "Climatic Regions of the Globe" and "Military Topography." Dr. Herbertson's subjects are "Regional Geography of Continental Europe," "British Isles" and "Types of Land Forms." Mr. Grundy takes a course in the "Topography of Greece in Relation to Herodotus and

Thucydides," while Mr. Beazley deals with "The Period of the Great Discoveries, 1486-1650."

In view of the doubts which have been expressed as to the future arrangements for the Certificate Examination for teachers in elementary schools, and the position of candidates who desire to become certificated in 1902, the Board of Education have issued a short statement showing what is intended. In 1902 there will not be held any First Year's Certificate Examination. The only examinations will be those of the Second and Third Years, which will be conducted in accordance with the Certificate Examination Syllabus for 1902, already published. The conditions of admission will be those laid down in the Code of 1901.

DR. KIMMINS, in a paper called "The Educational Ladder," published in the current number of *The Record*, lays down seven principles which, he thinks, should guide the framers of scholarship schemes. The second of these reads: "From the first, the scholarships should carry with them, in addition to free education, adequate money payments to recoup the parents for the wages the children might earn in various employments." Commenting on this principle in the *County Council Times*, Mr. Macan, Organising Secretary to the Surrey Technical Instruction Committee, points out the opportunity it gives the idle and dissolute parent to make a living out of the payments made by the State for several clever children, and maintains that our object should be to educate public opinion to the desirability of raising the age at which children leave school, and not, by money payments, tacitly to agree that the normal state of affairs is to send youngsters to paid employment at the earliest possible moment. By all means ensure food, raiment and other necessities for the scholarship holder, but it is not wise to provide "compensation" for the parent.

THE first volume of the report of the Commissioner of Education to the United States Bureau of Education for the year 1899-1900 has now been published. Amongst other interesting contents are included chapters on the "Development of English Secondary Schools for Boys" and "Education in Great Britain and Ireland." The former is the substance of a lecture by Dr. Aronstein, delivered at Hamburg in 1896, but it has been enlarged and re-written. While giving an entertaining account of some aspects of our secondary schools, there are other grades of secondary education which are ignored. It is enough to glance through the list of books consulted by Dr. Aronstein to see that he regards the public schools as almost exhausting our provision for intermediate instruction. The *résumé* concludes with a useful chronological table of the history of English secondary schools for boys. The survey of education in Great Britain is concerned chiefly with the English system of elementary education. After describing the new Board of Education, the paramount problem of the hour, as it is here called, is discussed, namely, the adequate supply of secondary schools and their adjustment to the public elementary schools and to the wants of the industrial classes. Following a common American custom, a number of articles of permanent value from English reviews are embodied in this chapter. These include, with others, Sir Joshua Fitch's article on "Higher Grade Board Schools," from the *Nineteenth Century*, and that of the Hon. E. Lyulph Stanley on "Higher Elementary Schools," from the *Contemporary Review*. This first instalment of the report runs to 1,280 pages.

THE Royal Academy of Social Sciences at Erfurt has just awarded a prize for the best essay on "the education for civil society of youths between the period at which they leave the national school and that at which they enter upon their term of

military service." The essay submitted by Dr. Georg Kirschensteiner, a Royal commissioner for schools and a city Schulrath of Munich, was selected for the prize out of seventy-five sent in. Dr. Kirschensteiner maintains that boys and girls leaving national schools should be educated to efficiency in their respective occupations and in a love of work which results from the possession of conscientiousness, diligence, perseverance, and self-control. They should be taught to understand the unity of interests of all sections of the population with one another and with the interests of the country, to know the principles of hygiene, to practise physical self-control, devotion to social duties and justice to their fellow-men. The contents of this prize essay and the fact that such a prize was offered for public competition shows very conclusively that the difficulties with which English educationists are all too familiar are not unknown in Germany, the education of which we are apt to regard as very near perfection.

A RETURN recently published shows the amount spent on technical education by local authorities in England, Wales, and Ireland—with the exception of twelve which have made no return—during the years 1898-9 and 1899-1900. Particulars are also given of the amounts raised by loan on the security of the local rate under the Technical Instruction Act, 1889—mainly for the erection of science, art, and technical schools. The return shows that the total amount thus expended on technical education in England, Wales, and Ireland during the year 1898-9 was £870,612 11s. 7d.; and during the year 1899-1900, £915,134 15s. 1d. These amounts are exclusive of the sums allocated to intermediate and technical education under the Welsh Intermediate Education Act, 1889. The amounts raised by loan on the security of the local rate under the Technical Instruction Acts were—in 1898-9, £105,301 2s. 4d.; in 1899-1900, £90,347 10s. 7d. The total amount of the residue received under the Local Taxation (Customs and Excise) Act, by the Councils of Counties and County Boroughs in England (excepting the County of Monmouth) in 1898-9 was £867,061 8s. 4d., of which £797,488 19s. 1d. was appropriated to educational purposes, and £69,572 9s. 3d. to relief of rates. The total amount of the residue received in 1899-1900 was £980,928 3s. 6d., of which £886,329 5s. 6d. was devoted to education, and £93,364 9s. 6d. to relief of rates. The total amount expended on technical education during the year 1898-9 was £830,404 17s. 2d., and during the year 1899-1900, £876,436 6s. 11d.

SCOTTISH.

THE Committee of the General Council of St. Andrews University has just issued its report on the position of Modern Languages at the Bursary competition. The Committee has accepted the principle of instituting alternative groups of subjects with a certain proportion of bursaries attached to each group. Prof. Butchart, of Edinburgh, was the first to suggest this compromise, but in his scheme the number of subjects per group was to be six. The St. Andrews Committee has unanimously agreed that four subjects are a sufficient and adequate basis for an entrance examination to university life. The Committee wisely urges that to maintain a high standard in six or even five subjects (as was proposed by Glasgow University) was a greater strain on the average candidate than could fairly or with advantage be put upon him. The attitude of the Committee will have the hearty support of the great majority of secondary teachers who recognise the impossibility of obtaining thorough efficiency in a greater number of subjects.

THE annual general meeting of the Secondary Teachers' Association was held in the Royal High School, Edinburgh, on

November 30th. Mr. Malcolm, Dollar Academy, in his retiring address as president, hoped that Lord Balfour during the coming session would make an attempt to solve the greatest educational problem of the day—how best to raise the whole level of education by organising secondary schools and by establishing a real organic connection between them and the primary schools on the one hand, and the Universities on the other. There was a general agreement among the critics of an Education Bill that the two main points to be borne in mind were the fixing of a proper area and the creation of a properly constituted local authority. The volume of opinion in favour of administrative unity for all grades of education had enormously increased of late years. That involved the creation of areas much larger than the present School-board areas. Education was about the last public function which should be administered in small areas, and the present districts were too small and parochial even for elementary education. The local authorities, together with an elective element, should include representatives of secondary and elementary schools.

THE annual meeting of the Educational Handwork Association was held in the U.F.C. Training College, Glasgow. The Secretary's report showed that a series of classes in educational handwork had been carried on at St. Andrews during the summer months. These classes had been largely attended, and many applicants had to be rejected for want of accommodation. The expenses in connection with the course had been met by contributions from the County Committees of Lanark, Ayr, Fife, and Midlothian, and the School Board of Glasgow. Mr. Scougal, H.M. Chief Inspector of Schools, said that the future of this subject lay with the teachers themselves. Manual dexterity and intimate knowledge of detail were of little use to teachers unless they were accompanied by a sound grasp of the educational principles underlying their work. The bane of educational work hitherto had been a craze after tangible, measurable, examinable results. In this as in other subjects they would receive recognition and encouragement from the Education Department for patient, sensible, earnest work.

THE report of the Education Department on the training of teachers foreshadows important developments in next year's Code. King's students and King's scholars are to have provision made for practice in teaching, but otherwise they are to be ordinary university students following a course specially mapped out for them by the local committee, or training college authorities. The double strain of attendance at the University and the Training College has in the past reacted injuriously on the work of the students in both institutions. The concentration of effort, and the saving of time that the new regulations permit, should enable these students to take an even higher position in the Universities than they have done in the past.

FOR the non-university students of Training Colleges, the Department propose a more limited but more thorough course than at present. Those subjects which are essentially germane to an elementary-school course will receive fuller treatment and will leave little time for the extraneous subjects which at present receive most attention. The aim of the Department is to secure a supply of teachers fully qualified, not merely from their knowledge of particular subjects, but from their understanding of the educational function of each, to present them to the mind of the pupils in the manner best calculated to train and educate their faculties.

ENCOURAGED by the success which has attended the work of her sister, the Countess of Warwick, at Bigods, near Dunmow, in Essex, the Duchess of Sutherland has boldly entered upon a scheme for providing a technical school in a still more remote

rural district, viz., near Golspie, on the Dunrobin estate in Sutherlandshire. No provision for secondary and technical education in the Scotch Highlands at present exists, and the proposed school must meet a long-felt want. The draft scheme, which has been drawn up by the Duchess with the co-operation of Prof. Meldola, provides for the education of fifty pupils in the principles of those sciences which bear in any way upon the local industries, including agriculture. The pupils will be taken from the elementary schools and admitted only when fully qualified to take advantage of the secondary training offered by the Sutherland school. In view of the excellent character of the elementary teaching in the Scottish schools, there should be no difficulty in finding a constant supply of promising pupils, more especially as the new school is intended for board and residence, and caters for the three counties of Sutherland, Ross and Caithness. Like Bigods, the Sutherland technical school is to be mixed and the curriculum adapted to the requirements of boys and girls. The Duke of Sutherland has given the site for the building and land for the agricultural work close to Golspie, besides £5,000 towards the building and equipment fund. Mr. Andrew Carnegie contributes £5,000 to the same fund, and Mrs. Carnegie two bursaries of £30 each annually.

IRISH.

THE first report of the Commissioners appointed to inquire into the present condition of the higher, general, and technical education available in Ireland outside Trinity College, Dublin, and to report as to what reforms, if any, are desirable to render that education adequate to the needs of the Irish people, has been published. The appendix to the report is a large volume of 421 foolscap pages, containing minutes of evidence taken at the first nine sittings held at Dublin in September, to which we have already made reference, and documents referred to in the minutes. As giving some idea of the task before the Commissioners, it may be pointed out that the evidence of single witnesses runs in some cases to nearly fifty pages, and since such evidence is often strengthened by statistics and other material handed to Mr. J. D. Daly, the Secretary to the Commission, it must be some time before the final report and recommendations can be published. A second series of meetings to take evidence on the subject of technical education in connection with university education was held in Dublin at the end of November, when amongst other witnesses Mr. T. P. Gill, Secretary of the Department of Agriculture and Technical Instruction for Ireland, and Professor J. R. Campbell, Assistant Secretary in respect of agriculture in the same department, were examined. We shall await the publication of the Report containing the recommendations of the Commissioners before dealing with the subject in detail.

THE Right Hon. Horace C. Plunkett, Vice-President of the Department of Agriculture and Technical Instruction for Ireland, has issued a memorandum on agricultural education, in which he details the principles which are guiding, and will guide, the Department over which he presides in establishing a system of agricultural and technical education for Ireland. The first proposition Mr. Plunkett emphasises is that Irish farming does admit of an improvement, which, if effected, will result in a large addition to the wealth of the country, will enhance the comfort and well-being of the people, and will check the deplorable drain of emigration. To bring about such improvement, a sound, modern system of agricultural education is to be established after, for it is not possible before, securing the co-operation of the parents of the youths it is desired to start in a home industry with the educational advantages of progressive communities abroad.

It is rightly pointed out that it would be worse than a waste of money and energy to inaugurate elaborate schemes which might be found on experience of their working to have been premature or unsound. Any waste of present resources by unwise expenditure is a trifling consideration compared with the mortgage placed upon the industrial capacities of future generations by starting out upon wrong educational lines. Since all educational reform is confronted with the adverse condition that supply has to precede the demand, and as the educational systems of a country ought to be interdependent, Mr. Plunkett's department has given much attention to finding out exactly what are the present resources, from an educational point of view, of the country.

THE scheme of the Department of Agriculture and Technical Instruction is at present threefold in its operation. It consists of itinerant instruction, of the utilisation of existing schools, and of the training of teachers. Later on, when circumstances have developed, technical schools for the special teaching of agriculture will be required to serve separate counties or smaller areas. It is fully recognised, even now, that farmers must be men trained from school days to observe and interpret accurately the influence of environment on plant and animal life, and consequently the paramount necessity of a graduated system of education, of which practical science will form an important part, is kept in view. As our readers already know, the Department has drawn up a detailed schedule of suitable instruction in physics and chemistry for intermediate schools, and the National Education Commissioners are doing their best to provide similar help for elementary schools.

FOR girls it is hoped to establish a link between the primary and the secondary school; and in the girls' secondary schools special emphasis will be given to the teaching of domestic science. Whatever her future in life, a girl will in all probability be concerned with the care of others, and a training in household management, the principles governing the maintenance of health, and the care of the young, must be regarded as an important part of a girl's educational equipment. As those girls for whom the scheme makes special provision will belong to the agricultural classes, the teaching is to include also dairying, poultry management and care of farming stock, &c. In many districts instruction of this kind will have to be taken to the very doors of the people, and just as in the matter of agricultural education, so in regard to what, for the want of a better term, may be called household economy, a well-trained itinerant instructress will carry this means of training into even remote rural districts.

WELSH.

AT a meeting at Pontypridd last month, Dr. Macnamara, M.P., incisively dealt with Elementary Education in Wales. Again the figures of attendance were given: Wales, 77.9 per cent.; England, 82.3 per cent.; Scotland 83.75. "Every unit in the year's attendance was now worth 30s. in Government grants." Yet out of 386,017 on the school rolls, the average daily attendance was only 300,756. "Welsh irregularity of attendance," Dr. Macnamara argued, thus "robbed the Principality of £130,000 Government grants." Dr. Macnamara went on to show that in Wales the percentage of children over 10 years of age in elementary schools was 30, whilst in England it was over 35, and in Scotland over 42 per cent. "Of the 441 Welsh local authorities entitled to fix bye-laws for exemption from school, only four fixed the seventh standard, and only 69 the sixth standard. In Scotland the amount spent per child on educational maintenance last year in the elementary schools was £2 13s. 9d.; in England it was £2 11s. 9d.; in Wales it was

£2 8s. 11d. Surely if a sagacious and thrifty people like the Scotch spent nearly 5s. a head more than the Welsh, it was because they knew they would get good value for their money."

DR. MACNAMARA further directed attention to the fact that in the Welsh intermediate schools there was a qualified teacher on the average for every sixteen pupils. This is a fact which will be heard about a good deal in the future—for helping forward the elementary school-teacher. And not without reason, if it can be fairly urged, as Dr. Macnamara urged, that "two out of every three teachers engaged in the Welsh elementary schools were either wholly or partially unequipped for effective service." Once more to quote the well-known fact—between 70 and 80 per cent. of the children in the intermediate schools come from the elementary schools. It behoves, therefore, all educationists, both those interested in *intermediate and elementary* education, to look into these statistics of Dr. Macnamara. We have yet to realise as a community that education is an organic whole.

MR. SAMUEL SMITH, M.P., was the chief speaker at the opening of the new county school at Rhyl. Mr. Smith brought together some interesting facts concerning the Welsh intermediate school system. In the last report there were 94 county schools with a total of 7,445 scholars. The average income of each headmaster was £276, and of each headmistress £232, of each assistant-master £125, and of each assistant-mistress £101. Roughly, the totals paid in salaries for the collective staff of the new school amounted to £45,000 a year.

ONE of the great difficulties before the county schools, as Mr. Smith observed, is the short time the pupils remain in the school. This is a point which can only be remedied by an enlightened public opinion. There is another point referred to by Mr. Smith, viz., the nature of the home influence in exerting a right and helpful tendency in educational work. "Buried in a Blue-book would be found the evidence of Mr. Williams, formerly second master at Llandovery, one of the best masters he had known. In a class of 30 boys averaging nearly 15 years of age, he found that nine boys had never read a line of Shakespeare, Milton, Tennyson, Byron, Longfellow, or Burns. Our boys and girls did read, no doubt, but the ineffable trash which cheap literature supplied did not quicken intelligence, but often filled the mind with unwholesome food." The question of training the pupil to a reasonable recreation in reading is often looked on as the teacher's task. But Mr. Smith certainly was justified in regarding this as partly, at any rate, the parent's responsibility.

IN accordance with a resolution of the Court of the University of Wales, that the holders of Gilchrist Travelling Studentships in the University who submit reports worthy of publication should be invited to give a lecture on the subject of their investigation at a meeting of the Court, Mr. William Lewis, B.A., Headmaster of Llanelly County School, was asked to lecture on the occasion of the meeting of the Court at Aberystwyth, last month. Mr. Lewis's subject was "Manual Instruction in France and Switzerland." The holders of the Gilchrist Studentship in the University of Wales have been:—Miss Joan B. Reynolds, B.A.—subject, the Teaching of Geography in Switzerland and North Italy; Mr. T. R. Dawes, M.A., Headmaster of Pembroke Dock County School—subject, the Bi-lingual Question in Belgium and its effects on the acquisition of modern languages; Miss H. M. Row, B.A., of the Gelligaer County School—subject, the training of teachers, particularly rural teachers in Canada.

ONE of the difficulties connected with teaching the history of Wales in Welsh schools has been the absence of sufficient and

adequate books on the subject. Just lately, however, several important sketches of the subject have been published. Of these, Mr. O. M. Edwards' "History of Wales" in the Story of the Nations Series has long been looked for. There is little doubt that it will be read with great enthusiasm, in which Englishmen and Welshmen will alike join. Mr. Arthur G. Bradley has written for the Heroes of the Nations Series a picturesque and attractive sketch of the hero Owen Glyndwr. Further, Mr. Morris has written a history of the Edwardian wars.

CURRENT HISTORY.

Do our readers happen to have heard that there has lately been completed a new translation into English of the New Testament? If not, they might like to know of the "Twentieth Century New Testament," the work of some twenty scholars whose object has been so to translate the Christian Scriptures that they may sound in the ears of modern Englishmen as they sounded to those to whom they were first addressed in Hellenistic Greek now nearly 1,900 years ago. Let them, at any rate, get a copy and form their own opinions on the advisability of the attempt and the success which the translators have attained. They need be in no fear of riots in consequence. If they were subjects of the present King of Greece it would be a different matter. In that turbulent kingdom language is a burning question. The Greeks have for a hundred years been trying to believe that they are "Hellenes," not "Romaioi"; that they are not a mongrel race, compounded of all the elements that for the last two thousand years have invaded their peninsula, but that they are unadulterated descendants of the Athenians and Lacedaemonians, the Boeotians and Messenians of whom our schoolboys read, and to whom Paul spoke in the Areopagos. Early in the last century their literary leaders strove to purify their language and bring it back to the "classical" models, and Greek patriotism would fain believe their effort has been such a success that it can be ignored as a thing quite unnecessary. Therefore, when it is proposed to make a translation of the Greek New Testament into "modern" Greek, in order that the ignorant peasant may read it in his own speech, educated Greeks are indignant to the point of rioting, and even suspect some subtle "Russian plot" in the proceeding. "Hellenism" did a great work when it enlisted European sympathy in 1820-30, and helped to rescue a people from Turkish rule; but its inherent unreality is now working mischief.

THE election of Arthur Lynch to represent Galway City in the House of Commons may result in some interesting news this month, or, on the other hand, it may not. Mr. Lynch has fought, it is said, against Great-Britain-and-Ireland in the Transvaal, and it is a doubtful point if he is legally capable of sitting in the House. But the Commons may be historically-minded, and they will then remember the cases of Wilkes and Bradlaugh. Middlesex and Northampton were respectively determined on "the man of their choice," and though in each case the House of Commons won a technical victory, all the moral advantages went to the other side. And further, both Wilkes and Bradlaugh afterwards sat in the House to which they had been denied admission, the one to sink into the obscurity out of which he should never have emerged, the other to become a useful and honoured member. If, therefore, history can teach any lessons, our readers will look up these historic cases, and thus learn something about "general warrants," the "law of maintenance," and the nature and uses of oaths, and the House of Commons will let Mr. Lynch take his seat and any oath or declaration he pleases, and find his own level. What the Law Courts will have to say to him as a British subject will be another matter.

THE recent publication of a Parliamentary paper has awakened recollections of a story in which we were interested as youngsters—the Mutiny of the *Bounty*. In 1790, Capt. Bligh went to Tahiti to fetch some bread-fruit trees thence to the West Indies with an idea of acclimatisation. On the return voyage the majority of his crew successfully mutinied, and, setting their captain adrift, sailed to Pitcairn Island, where they remained undiscovered for eighteen years. Their descendants multiplied, and in 1831 and 1855 there were emigrations to Tahiti and Norfolk Island, but some of them still inhabit the ancient "asylum"; and, in these days of universal communication, even this far-off Pacific island is being brought into permanent economical connection with the outer world. Mr. Chamberlain has been interested in a plan for the improvement of the Pitcairn islanders by developing a trade in their surplus products with Tahiti. The old story is interesting, and may be found, if not elsewhere, in that collection so well adapted for a school library—*Chambers' Miscellany* (40 volumes, 6d. each). The new story, as we have said, is to be read in a recent Parliamentary paper (Cd. 754), to which we refer our readers, and from which we learn that a Pitcairn language is developing—a variety of English.

RECENT SCHOOL BOOKS AND APPARATUS.

Modern Languages.

Goethe, Hermann und Dorothea. Edited by C. A. Buchheim, Ph.D., M.A. xxxvii. + 152 pp. (Clarendon Press.) 3s.—It is fitting that it should be an edition of Goethe's beautiful epic which closes and crowns the rich life-work of Buchheim, about which his daughter tells us in a short notice prefixed to this volume. Indeed, he did not quite finish preparing this edition; the notes were fairly complete, and show the scholarship and conscientious care which mark his editorial work; but the introduction is by Professor Dowden; and a very satisfactory piece of work it is, dealing with "Hermann and Dorothea" from the literary standpoint. It is to be regretted that the formal side is not treated. On the whole, it is a most satisfactory edition. Some day, perhaps, the Clarendon Press will acquire a more modern fount of German type.

All French Verbs in Twelve Hours. By A. J. Wyatt, M.A. vi. + 43 pp. (Blackwood.) 1s.—We thank the ingenious author for his very brief and serviceable account of the French conjugations, and above all for pointing out what is too often forgotten, namely, that the majority of the exceptions among verbs form most of their tenses quite correctly, only a few indulging in an irregularity which borders on indecency. We venture, however, to express a hope that this practice of treating chapters of a grammar as separate books will not spread. We are threatened with as many treatises as there are parts of speech, if we do not protest in time.

Molière. Scenes from Le médecin malgré lui. Edited by W. J. Clark, M.A. 32 pp. (Blackie.) 4d.—The publishers are to be congratulated on their spirit of enterprise in furnishing teachers with short selections from standard authors, well edited, well printed, and nicely bound, at a remarkably low price. Mr. Clark, in this volume, gives a short biographical note, and some details about the play. Then follow 23 pages of text and four pages of pithy notes. It is just the kind of thing to stimulate a good pupil by giving him a foretaste of Molière.

Le Sage. Selections from Gil Blas. Edited by H. W. Atkinson, M.A. 39 pp. (Blackie.) 4d.—This edition of selec-

tions from Le Sage's immortal novel belongs to the same series as the volume just noticed, and can also be warmly recommended. We notice that Mr. Atkinson refers the reader to the Phonetic Dictionary of Michaelis and Passy. We wonder how many could find their way about in it. How many school libraries possess a copy?

Interlinear German Reading Book. By F. Hahn. Edited and revised by C. A. Thimm. 101 pp. (Mailborough.) 1s. 6d.—A selection of passages from such authors as Hauff, Heine, Musäus, Jean Paul. An occasional private student, deprived of all other means of learning German, may derive benefit from this book. There may even be some teachers who believe in the Hamiltonian system of interlinear translation. To see Heine's *Die Vögel singen abgebrochene Sehnsuchtslaute* rendered by "The birds sing worn-out sigh-notes," or to read that the trees "have it in their youth sour become let," while a foot-note suggests as an idiomatic rendering that the trees in their youth "laboured tooth and nail," is not calculated to make one a ready convert to this old-fashioned "method."

E. Laboulaye, Poucinet. Es-tu content? ou L'histoire des nes; and Les douze mois. Edited by W. M. Poole, M.A. 76 pp. (Arnold.) 9d.—Three well-told fairy-tales, which remind us of the far more famous ones by Perrault. They make excellent reading for children who are familiar with common words and the simple rules of grammar. Mr. Poole is an able teacher, who has done the editorial work most satisfactorily. There are brief notes; a number of English sentences based on the text, for re-translation; a good appendix containing the more important rules of syntax, preceded in each case by suitable examples, a list of the principal parts of irregular verbs, and a vocabulary. The whole series to which this little volume belongs may be recommended to the notice of teachers.

Junior French Examination Papers. Compiled by F. Jacob, M.A. 75 pp. (Methuen.) 1s.—It is stated that this is the initial volume of a "Junior Examination Series," and that it is for the use of candidates for the Oxford and Cambridge Junior Local Examinations. This purpose it will serve; some of the questions, however, we hope will never appear in any Junior Local paper. No pupil should be worried with the "book-work" of grammar to such an extent as to be expected to answer offhand questions of this type: "How are the two interrogative forms of a verb expressed? Give the masculine form of *quarteronne, canelle, dogaresse*. What is the only part of speech which can govern the relative pronoun *que*?" Nor do we like: "Write five sentences illustrating the fact that the verb *to be* must sometimes be translated by *avoir*—the preposition *à* is understood before personal pronouns with most verbs governing the dative. Mention three cases in which *à* must be expressed." The only mistake in the printing we have noticed is *terez* for *tenez* on p. 4.

Portuguese Grammar and Commercial Handbook. By C. Mascarenhas. 204 pp. (Hirschfeld.) 5s. net.—The author deserves our thanks for supplying a grammar of the Portuguese language; it will serve the purpose until a work on more modern lines appears. The book consists of chapters dealing with "orthography," by which is meant phonology, and which is the least satisfactory part of the book; "etymology," or rather accidence, which is well treated on the whole; and syntax, which it would have been better to take together with the accidence. There are also numerous sentences for translation into Portuguese, which should have been numbered. The rest of

the book is taken up with lists of idioms, phrases, commercial terms, and a number of Portuguese and English commercial letters for translation. The English of the grammatical explanations is often awkward; the text should have been revised by an Englishman. It is a pity that no vocabulary has been added; this should have been possible, considering the rather high price of the book. The proofs have been read with fair care; but the ink used in printing it is too pale.

Classics.

Bell's Latin Course. Part III. By E. C. Marchant, M.A., and J. G. Spencer, B.A. xx. + 148 pp. (Bell.) 1s. 6d.—This part completes the first year's course, and is a successor quite equal in merit to the other parts. The exercises are well graduated and interesting: they include a dialogue on the inauguration of the Australian Commonwealth, and a reflection



Diogenes and Alexander the Great.
From "Bell's Latin Course." Part III.)

on the death of Queen Victoria. English exercises for turning into Latin are added. The pictures should help to an intelligent interest; we reproduce one illustrating a well-known interview.

Livy. Book XXI. By F. E. A. Trayer, M.A. xxxv. + 255 pp. (Bell.) 2s. 6d. *Thucydides. The Athenians in Sicily.* By the Rev. W. C. Compton, M.A. xl. + 237 pp. (Bell.) 3s. 6d.—These two "Intermediate Series" volumes may be conveniently noticed together, as they present many features in common. Both editors carry their unwillingness to give construe helps in the notes somewhat too far, in our opinion, though the very valuable lists of idioms arranged by chapters atone for this in a great measure. Both books are supplied with excellent maps, and the illustrations are very satisfactory. Those of Mr. Compton's book are specially noteworthy as being taken from photographs by Mr. H. Awdry, who visited Syracuse with the editor on two occasions. Mr. Compton has added considerably to our topographical knowledge of the scenes of the sixth and seventh books of Thucydides.

In the same series as the above Mr. E. C. Marchant, M.A., gives us an edition of *Homer, Odyssey I.* (75 pp., 2s.), which we recommend masters to procure in order to start their classes on the study of Homer. It will give the beginner a good send-off

in the right direction. Metre, forms, syntax, etymology, all receive careful treatment, and there is no excessive elaboration.

The Eumenides of Aeschylus. By L. D. Barnett, M.A., D.Litt. xxxii.+151 pp. (Blackie.) 3s. 6d.—The editor, in his right protest against the excessive ingenuity of emendacious (the word is his own) critics, is, we think, somewhat too conservative. He has to admit five pages of corrections of MS. readings, roughly one in every five lines, and probably the traditional text is corrupt in a good many more cases. He might also have given more room to the views of others on disputed passages instead of merely setting down his own dogmatic statement, for when a boy has arrived at the stage of reading Aeschylus, he ought to be ready to consider *pros* and

Scott aflame in youthful hearts. The introduction is well worth a boy's reading, and the notes are useful.

Poems of Longfellow. 86 pp. 6d. *The Story of the Pirate.* 55 pp. 6d. *Poems of Shelley.* 70 pp. 6d. (A. & C. Black.) —These booklets continue the same features we have previously noted in foregoing issues in this series. In their way they are admirably done, and contain the promise of utility, which is, however, less than one would wish to say of them. The "Teaching Exercises" in the case of Shelley's poems seem to suggest a standard of acquirement almost unnaturally high. Those affixed to "Longfellow's Poems" are, like the poetry, pitched in a slightly less exalted vein.

Lectures and Essays. By the late W. K. Clifford, F.R.S. Edited by Leslie Stephen and Sir F. Pollock. In two volumes. (Macmillan.) 10s.—We are glad that these lectures and essays of the late Prof. Clifford have been added to the justly esteemed "Eversley Series." It is rather a pity that the bibliographical sketch of Clifford's work which formed part of the introduction to the first edition has not been here reproduced. Those of our readers who have not yet read these luminous contributions to science and ethics cannot do better than make their acquaintance by the help of these convenient, attractively printed volumes.

Henry V. By Fanny Johnson. (Blackwood.) 206 pp. 1s.—There is a great effort made in this edition to be simple, and render this play serviceable to the most juvenile readers of Shakespeare who can be expected to study him at all. With this in view, the introduction is eminently adapted to very young children; and the uncommonly copious notes leave scarcely a line of the play without attempting to explain some word or phrase. Indeed, this copiousness of explanation leaves so little for the pupil to do as to make no demands upon what native intelligence he or she may possess. The long extracts from Holinshed are perhaps interesting, and the glossary is serviceable, but the audience to which this effort at editing Shakespeare can appeal is necessarily limited.

Macaulay's Lives of Johnson and Goldsmith. By J. Downie, M.A. 136 pp. (Blackie.) 2s.—Macaulay as a school subject is becoming ubiquitous, and on publishers' catalogues a small selection from his works figures with "a most damnable iteration." It is therefore quite refreshing to find the editor of this present volume admitting that "many of Macaulay's writings may be regarded as unsuitable for the young and inexperienced student, because of their exaggeration and misrepresentation of facts, or because of their ornate diction and gaudy rhetoric." This really makes a most promising beginning, and the edition proceeds throughout on temperate and sane lines. The introduction is indeed far better than the average of such compositions, though it is not easy to subscribe to Mr. Downie's opinion that "one thing is indisputable: Macaulay stands out as a master and a model of the art of exposition." Much more to the point would it be to convince youthful minds, in Mr. Birrell's words, that "Macaulay's style—his much-praised style—is ineffectual for the purpose of telling the truth about anything." If boys at school could only be persuaded to regard Macaulay as a sort of romancer, perhaps the art of composition in English essays would be the gainer, to say nothing of history, and to make no mention of truth at all.

English.

Language Lessons. Books IV., V., VI. 60 pp. (Arnold.) 3d.—These books might be used with profit in the lower forms of our secondary schools. They are the second part of a course in English grammar in its relations to composition, and the author has been enabled, by the omission of much of the



Themis as Prophetess.
(From Barnett's "Eumenides.")

cons. For the illustrations we have nothing but praise; they are reproduced from ancient examples, some in terra cotta and black, and others, like that which we here give as a specimen, of Themis prophesying to Aegeus, in black and white.

Junior Latin Examination Papers. By C. G. Botting, B.A. 80 pp. (Methuen.) 1s.—These sets of questions, 72 in number, will doubtless prove of excellent service in testing the knowledge of boys preparing for examinations such as the Locals. They are arranged so that a constant maximum for each question throughout may be kept, the total being 100. This fact should commend itself favourably to teachers.

Edited Books.

Byron's Child Harold's Pilgrimage. Canto II. Edited by John Downie, M.A. 47 pp. (Blackie.) 2d.—Very useful, and exceedingly well done.

The Temple Reciter. Part I. Edited by E. E. Speight. 113 pp. (Horace Marshall.) 1s.—This is an admirable compilation, in which Browning and Walt Whitman have shares along with C. J. Lever, Bret Harte, and Dion Boucicault. In each of its four sections much attractive matter may be found.

Scott's Kenilworth. Edited by E. S. Davies. 216 pp. (A. and C. Black.) 1s.—This volume continues a now widely known series which is well adapted to keep the love of Sir Walter

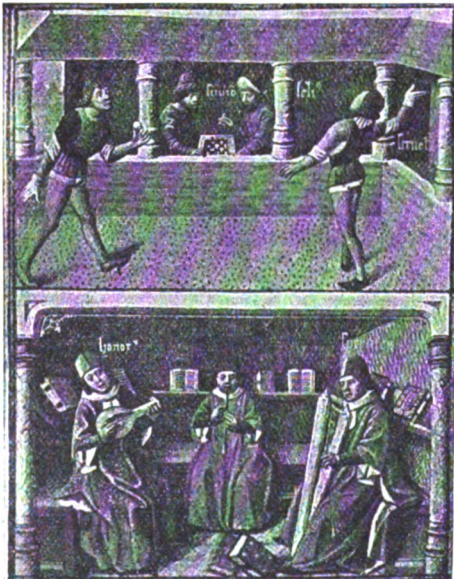
unnecessary terminology usually associated with grammar, to work out a reasonable and satisfactory course in English. The exercises are numerous and practical.

A School Grammar of the English Language. By E. A. Allen. 169 pp. (Isbister.) 2s. 6d.—This is another American attempt to expound the principles of the English language, and, like many others which spring from the same source, it is admirable and attractive. It is not an elaborate work, but adapted to intelligences in a comparatively rudimentary stage. The section which deals with the analysis of sentences is clear, but obviously needs to be supplemented by careful instruction; it would not help a student very far who should try to learn English by his own unaided efforts. Mr. Allen's method of analysis, too, needs compression. He eschews diagrams and parallel columns as being inconvenient; but his own method saves nothing in space, and involves a tremendous lot of writing, and altogether reminds one of the processes in algebra which fill half a page when every step is conscientiously shewn, and yet will go into two lines without any sacrifice of the truth whatever. The book is however, as a whole, remarkably lucid; and the exercises are very numerous and excellent.

History.

The Story of the North Country. 255 pp. (Edward Arnold.) 1s. 6d.—This is a most interesting little book, written, we should suppose, by a native of those parts who is enthusiastic about the counties of Northumberland, Cumberland, Westmoreland and Durham. There are several good illustrations, both pictorial and poetical, many quotations from old stories, and we follow with pleasure the story of those parts from the early Britons to the latest developments of modern industry. The map is one of the clearest and most useful we have seen for a long time.

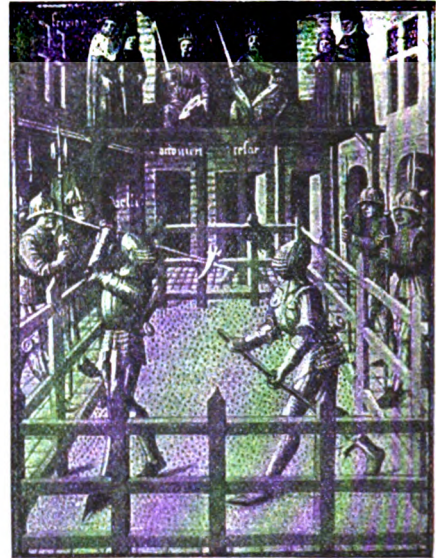
Chivalry. (Social England Series.) By F. W. Cornish. 369 pp. (Swan, Sonnenschein.) 4s. 6d.—It is somewhat



Amusements: Above, Tennis and Chess.
Below, Music.—Harl, 4375, f 151.

difficult to express a decided opinion on this book. There are altogether sixteen chapters with different headings, but the same subject seems to be treated in nearly all of them. There is much interesting information to be found in its pages, but, after a

careful perusal, nothing seems to remain in the mind except what we knew before. The author is evidently familiar with his subject, but he rather repels us from following him into what he confesses to be a wearisome form of literature, the stories, namely, of mediæval chivalry. His area is Western Europe



Duel with Axes.—Harl, 4375, f 171.

generally and France in particular; but we are not always clear whether he is at any given time speaking of France, England, or all Europe. The impression we gather is that the subject is difficult to treat apart, and the many iterations make us suspect that the author feels the task a heavy one to make us believe, contrary to the teaching of Freeman and Green, that chivalry in itself had any virtues, or in any way helped to further the progress of civilisation. Still, the book is well worth reading: it emphasises a side of history too much neglected, and will help to fill out for the teacher his picture of the middle ages and to explain that wonderful but now little understood world of thought and action. The author has suffered much from the printer: there are many small misprints, and the two lines at the bottom of page 127 should be at the top. We do not agree with the author that "diplomacy has *always* been a science of clever lying," nor that *all* "mediæval institutions set the weak at the mercy of the strong" (pp. 359, 367); but we do not know that we have lately met with a better idea than that expressed on pp. 307-8 as to the relation between Church and State (p. 307, l. 4 from end, "in" should be "against"). A word must be said in favour of the illustrations, about twenty in number, which are photographic reproductions of mediæval pictures of various kinds. By the courtesy of the publishers we are enabled to reproduce two of them.

The Normal History of Europe, 1814-1848. By M. K. A. Beisiegel. 145 pp. (Normal Correspondence College Press.) 2s. net.—This is a manual for "certificate" students. The story of each country is told separately, including that of the "German Empire," whatever that may mean. There are seven maps, clear in outline and uncoloured. The story, on the whole, is fairly told, but we have noticed several slips and blunders, some of them owing, perhaps, to the printer—especially the word "recussitation," which occurs twice.

History of Europe in Outline. 1814-1848. By O. Browning. 164 pp. (Macmillan.) 3s. 6d.—The title of this book is misleading. It consists rather of the history of each country told with some

amount of detail and with a wealth of names which is quite overwhelming. There is no introduction, no index, no maps and no bibliography. Indeed, it looks like a section of a book which is yet to be. But if the training-college students for whom it is primarily written read it through after mastering any other work on the same subject, they will find many facts to add to their note-books and to their knowledge of the period.

Essays on the Teaching of History. xx. + 104 pp. (Cambridge University Press.)—This little book is worth its weight in gold. After an introduction from the inimitable pen of Professor Maitland, Professor Gwatkin speaks of Ecclesiastical History, Mr. Poole of Palaeography and Diplomatic, Mr. Heitland of Ancient History, Dr. Cunningham of Economic History, Mr. Tanner of Constitutional History, Principal Woodward of the Aims of History Teaching in Schools, and Mr. Marten of the Practice thereof; and Professor Ashley tells how History is taught in America. Lest our readers should be ignorant on the point, we remark that all of these are past-masters in the subjects of which they respectively treat, and that in reading their words we seem to be walking on the heights, above the mists and difficulties of this workaday world, where "eternal sunshine" sheds clear light and our spirits are invigorated by the bracing air. In sober truth, let our readers buy and read this book as a tonic. They will get therefrom a distant view of the goal of their labours, and be inspired with faith and hope in the after reaping.

Geography.

Geographical Summary. For Advanced Competitive Examinations. By G. Webb. viii. + 111 pp. (Philip & Son.) 2s.—This book, which is specially prepared for use with Phillips' "Advanced Geography," consists almost entirely of lists of names.

The Pictorial Geographical Readers. The British Isles. 223 pp. (Longmans.) 1s. 6d.—The number and excellence of the illustrations make this a useful and cheap text-book. Forty-four reading-lessons on the British Isles are followed by a summary containing several good maps and diagrams. Some of the lessons are very instructive, notably those on Water Problems, The Geography of Sport, The Tailors' Dummy, and The Kingdom of Zephyr.

New Geography Readers. America. vii. + 256 pp. (Macmillan.) 1s. 6d.—We had the opportunity, a few months since, of drawing attention to several valuable features of another member of this series. The book now before us is in no respect inferior to its predecessors, and we can confidently recommend it to teachers of middle forms who wish to impart to their geography lessons something of the interest and usefulness that belong to the proper treatment of any branch of science. In the present case the continent of America is described in such a way as to lead the pupil to see the interaction between man and his environment, and this is what a text-book in geography should do.

The Victoria Regina Atlas. 200 plates. Size of plates, 12½ x 10 in. (W. & A. K. Johnston.) £1 1s.—Of the 200 plates in this atlas sixty-six are devoted to Europe, twenty-nine to Asia (sixteen to India), eighteen to Africa, thirteen to Oceania, thirty-eight to North America, and thirteen to South America; the first twenty-four are mainly astronomical and climatological. Not all the continents are represented on the same scale, and it is somewhat surprising to find that Australia is on a larger scale than Europe. Besides the political maps there are physical maps of the British Isles and all the continents except Australia, and geological maps of the British Isles, Europe, and North America. The colouring of these

maps leaves nothing to be desired. On the map of the World showing the height of the land and the depths of the ocean-basins there are but two colours employed for the land—the 5,000 ft. contour being the only one indicated; on the other hand, the ocean is contoured for every 5,000 ft. down to 25,000 ft. We think the map would be improved by increasing the number of land contours. The plans of large towns form an excellent and valuable feature of the atlas; some of these are admirable and all are well executed. Here, again, we note with surprise that the particularly fine plan of Vienna has a plate to itself, whilst a similar plan of London is put on the same plate as a map of the Lake District and one of the Channel Isles. All the maps are clearly printed and are easily read by artificial light, including those of twenty-four sections of the British Isles, which are on the scale of about 12 miles to 1 in. It is very important in atlases of this type that the information should be as far as possible up to date; the Victoria Regina Atlas can be relied upon in this respect. In the next edition, however, it will be found necessary to alter the course of the Paucartambo river, which appears from the explorations of Colonel Pando, the President of Bolivia, to be an affluent of the Madre-de-Dios, and thus to belong to the Atlantic drainage and not, as has hitherto been thought, to the Pacific. There is an index of 150 pages which is, on the whole, satisfactory; in some instances names are not mentioned, e.g., the Dariel Pass. The orthography is not always consistent, e.g., Bosphorus, Bosporus, Bosphorus. In spite of minor blemishes, the atlas is one that we can cordially recommend for purposes of reference; taking into account the thoroughness of treatment the price is remarkably low.

Science and Technology.

Secrets of the Woods. By William J. Long. ix. + 185 pp. (Ginn.) 2s.—Those who have read Mr. Long's "Ways of Wood Folk" and "Wilderness Ways" need only to be told that this third volume is in every respect as good as its predecessors. Long training in woodcraft has given the author what to the layman seems a sixth sense; and he has in addition a style of writing which is attractive in the extreme. Reading the adventures of the wild creatures of the woods, as they "slip with noiseless feet through their native coverts, shy, silent, listening, more concerned to hear than to be heard, loving the silence, hating noise and fearing it," we too seem to know the wilderness from the inside. Not the least merit of the book lies in the fact that it consists of studies of animals, pure and simple, not of animals with human motives and imaginations. The volume is attractively printed and bound, and Mr. Copeland's illustrations are worthy of the text.

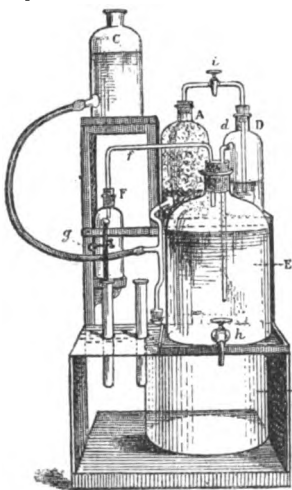
The Open-Air Boy. By Rev. G. M. A. Hewett, M.A., of Winchester College. xxii. + 271 pp. Illustrated. (George Allen.) 6s.—"I was once a boy" is Mr. Hewett's first sentence in this delightful book: a book which will appeal to all who are, have been, or understand boys. Angling, bird-nesting, butterfly hunting, caterpillar rearing, &c., are treated in a style which is genial, colloquial, and invariably entertaining. There is not a dull page in the volume. It is full of reminiscences of days—and nights—spent in observing and hunting the wild things of the fields and woods; of anecdotes of departed pets, from Cain the badger downward; and of hints upon camping-out and collecting. The chapter on "Cookery and the Fine Arts" is very laughable, and almost convinces us that roasted sparrow is the greatest of delicacies. Mr. Hewett's book is so amusing that its more serious excellences are at first in danger of being overlooked. The unobtrusive explanation of an example of natural selection which we find in the section on Butterflies is but one of many cases in point. We hope the

book will have a large circulation among not only boys but their teachers. It will do much to open the eyes of both.

A Country Reader for Use in Village Schools. By H. B. M. Buchanan, B.A. viii. + 248 pp. (Macmillan. 1s. 6d.—The first part of the book deals with farm animals in a very interesting manner. Part II. describes the wild life of the country, and explains clearly why certain birds, insects, &c., are to be encouraged and others destroyed by the farmer whenever possible. The book is admirably planned and beautifully illustrated, but it is marred by careless English and occasional, though serious, inaccuracies of detail.

Miscellaneous.

An Improved Form of Sulphuretted Hydrogen Apparatus.—For teachers and students who require to use both sulphuretted hydrogen solution and gas, the apparatus designed by Dr. F. W. Perkin will be found to save both time and chemicals. The apparatus is a modified form of Dr. Koninck's, and like it, has a large store of acid, B, for acting upon the ferrous sulphide, and also possesses efficient means for forcing out the acid from the sulphide when the gas is not being used. The modification



mainly consists of an arrangement for passing the gas, previously washed, into a large bottle, E, containing distilled water, before being used for precipitation. By this arrangement the water in the bottle is kept fully saturated with the gas; moreover, when the sulphuretted hydrogen solution is tapped off for use, the gas takes the place of the liquid withdrawn and largely prevents deposition of sulphur. The tendency of the gas to produce a back suction is partly prevented by the introduction of a bottle, F, which acts as a trap. This action would, however, be more certain if a suitable valve, such as a Bunsen valve, was used. The arrangements for emptying and refilling might also be improved by the addition of a suitable tapped funnel and an additional tubulure to the large acid bottle. With the exception of these minor points, the apparatus is a distinct improvement on the numerous forms of sulphuretted hydrogen apparatus in use, and is well worth a position in the chemical laboratory. The apparatus is supplied by Messrs. Brewster, Smith & Co., Finsbury Pavement, E.C.

Macmillan's Facsimile Modern Business Forms. By Fredk. Hooper and James Graham. No. 2, Export Trade. No. 3, Imports and Ships.—We recommend very strongly the use of these facsimile forms in conjunction with Hooper and Graham's excellent work on the "Import and Export Trade." The forms are accurate and well printed.

Saints and Worthies. By John Huntley Skrine. viii. + 181 pp. (Skeffington.) 3s. 6d.—The Warden of Glenalmond has a genius for appealing to the best side of a boy's nature. These sermons are expressed in simple, direct language, which, while it will interest young hearers, will also, we think, give rise to a healthy desire to emulate noble deeds. That school may indeed be proud which can number on its roll heroes like Alexander Cumine Russell, of "Birkenhead" fame.

CORRESPONDENCE.

The Editors do not hold themselves responsible for the opinions expressed in letters which appear in these columns. As a rule, a letter criticising any article or review printed in THE SCHOOL WORLD will be submitted to the contributor before publication, so that the criticism and reply may appear together.

Characteristics of Pupils in Girls' and Mixed Schools.

MAY I make a further appeal through your columns for aid from secondary and primary-school teachers? I have been for three years engaged in collecting data bearing on the likeness of brothers and sisters in both mental and physical characters. I have received most generous aid from many schoolmasters and mistresses, not only from the great public schools, but from high schools, grammar schools, private schools, board schools, national schools, and even dame schools. As a result of this coöperative work, I have observations on about 1,100 pairs of brothers, and this series is now completed. The reductions have been begun, and some of the conclusions reached were contained in a paper communicated to the Royal Society in November. But my series for pairs of sisters numbers at present only six or seven hundred, and that for pairs of brothers and sisters only about three or four hundred. The latter can, as a rule, only be observed in the few private mixed schools or in the village schools of the country. I venture, therefore, to ask for further aid from those interested in girls' schools or mixed schools. The observations required consist partly in measurements of the head, partly in the recording of hair-colour, eye-colour, and other physical characters, and partly in that judgment of the mental characteristics which any observant and careful teacher makes, almost unconsciously, in the course of a few months' acquaintance with children.

I shall be only too glad to forward to anyone who will consider the matter copies of the directions and schedules to be used, and should they find themselves able to help, a head-spanner and data forms will follow in due course. It is, perhaps, needless to say that all aid will be fully acknowledged in the final publication of the results. Further, I think anyone who may generously give time and energy to assist the investigation may rest satisfied that they are not only forwarding our knowledge of inheritance, upon which so much of conduct depends, but are helping to provide material whence we can draw safe conclusions as to the relationship of the mental and physical characters in childhood, and the correlation of both with general health.

KARL PEARSON.

University College,
London, W.C.

The Teaching of Mathematics.

TEACHERS are indebted to you for the full report you have given of Prof. Perry's paper on Practical Mathematics to the British Association, and for the outline scheme of a working course which appears in your November issue. These, reinforced by one's own experience, are sufficient to raise suspicion as to the utility, from an educational and practical point of view, of our present devotion to Euclidian methods and pure mathematics. They are not strong enough in themselves to justify one in discarding a time-honoured system, wherein every step is laid down in ordered sequence. To enable your readers to arrive at a mature judgment on the present controversy, I hope you will see fit in an early issue to publish a list of books which treat the subject from Prof. Perry's point of view. I daresay the best of these works are still to write, but

there must be a considerable literature on the subject, outside the knowledge of many of your readers, which would show the possibilities of Prof. Perry's scheme much better than is possible within the scope of a magazine article.

D. MACGILLIVRAY.

Glasgow.

THE literature on the subject is not confined to books, but largely consists of articles contributed to various periodicals such as *Nature*, *Electrician*, *THE SCHOOL WORLD*, &c. "England's Neglect of Science," by Prof. Perry (Fisher Unwin) also deals with the subject. There are some letters on the topic, too, from Messrs. Heaviside, Woollen and Mair, in the issues of *Nature* for September 6th and October 4th, 1900. The "Summary of Lectures on Practical Mathematics," published by the Board of Education, is a valuable statement of Prof. Perry's methods and the movement he advocates. Incidental references to the question also find a place in all Prof. Perry's published works, amongst which mention may be made of "Applied Mechanics" (Cassell); "Steam, Gas, and Oil Engines" (Macmillan); "Calculus for Engineers" (Arnold). The following books, to some extent, treat the subject from Prof. Perry's point of view:—"Elementary Practical Mathematics," Ormsby (Spon); Graham (Arnold); Cracknell (Longmans); Castle (Macmillan); "Practical Mathematics for Beginners," Castle (Macmillan); "Workshop Mathematics," Parts I. and II., Castle (Macmillan); "Inventional Geometry," Spencer (Williams & Norgate).

Heuristic Method of Teaching Chemistry.

In the interesting article by Mr. Bentley in your November number, there appears to me to be a point which calls for notice. One criticism frequently made on what has been called the Heuristic system is that it tends to lead students to conclusions based on insufficient evidence. This is undoubtedly true if teachers are not careful to guard against too hasty generalisations. In the article in question, for example, the reasons adduced for believing lime to be a metallic oxide are insufficient. It is certainly no use to rely on the similarity to the oxides of barium and strontium, which are compounds quite unknown to the students who are following the course, and they cannot directly prove to be oxides. The analogy to the oxide of sodium is more satisfactory, especially if sodium has been previously burnt in oxygen.

The study of chalk, however, should be but an introduction or a part of the study of carbonates, and it is from other carbonates that the evidence relating to the composition of lime must be obtained. The carbonates of zinc, copper, lead and magnesium all agree in their generic properties with chalk, and all these by the action of heat leave an oxide with which the student would already be familiar, and which he would recognise, and he could conclude with probability that lime is also a metallic oxide. Some of the above carbonates may also be obtained pure, and if the work is done quantitatively, a considerable number of data for the later development of equivalent weights are obtained.

LIONEL M. JONES.

I AM very much indebted to Mr. L. M. Jones for his criticisms and suggestions touching my recent article.

Mr. Jones points out the unwisdom of comparing lime with the oxides of strontium and barium, since they are substances which have not been proved by the students to be oxides. I fully appreciate the difficulty he raises; but, however the problem is attacked, the evidence at that stage is very incomplete, and we must undoubtedly rely on the resemblance of lime to the oxides of sodium and potassium, whose composition has been previously ascertained in the elementary course. The oxides of the two former elements I merely use as a further

illustration—which, of course, strictly speaking, is not consistent with the heuristic method.

With the latter part of the letter I cordially agree. It is from the other oxides that the best evidence of the composition of lime is obtained. The fact that on treatment with salt gas it produces water and a chloride is also an important corroboration of our views.

I had hoped that in my article I had made it clear that the composition of lime was at that stage an open question, and that only from additional data could we form any definite conclusion. It is not altogether a disadvantage that boys should be conscious of an unsolved problem, and that they should be continually seeking in their other researches for further evidence.

F. CRANMER BENTLEY.

Subjects for London Matriculation Examination.

THE Education Sub-Committee of the Assistant-masters' Association presented in October last a memorial to the Senate of the University of London placing before that body the views of the Association on the scheme for matriculation. The A.M.A. is of opinion that the matriculation should test a general education of secondary character, and advise that

- (a) The Mother Tongue, English History and Geography,
- (b) Natural Science,
- (c) Mathematics, and
- (d) Two languages,

should be compulsory subjects. Furthermore, it advises that the Natural Science syllabus be kept as at present, and that marks of distinction should be given for excellence in special subjects. As to making Latin compulsory, their opinions were equally divided. Thus we see that the changes advocated by the A.M.A. are not very great; they amount to substituting geography for historical English language and English literature, and to making a candidate take two languages besides his own. The former suggestion seems to me to be unfortunate, as the work for matriculation which a science student has to go through is often the only chance he has of acquiring an idea of the history of his own language. Besides, the English-language paper can be made the means of testing the candidate's general knowledge, of which every matriculant should possess a certain amount.

For the same reason, the second suggestion seems excellent, and one wishes the A.M.A. had gone further, and recommended that a *viva-voce* test should be compulsory whenever a modern language is chosen. P.

Natural History (and other) Societies.

I BELIEVE that the subject of Natural History Societies, dealt with by Mr. Headley in your last number, and indeed, that of all leisure-hour pursuits, will soon claim more serious attention from headmasters and their staffs than they do at present, with untold benefit to their schools; but my purpose now is not to plead for the organisation of voluntary literary and manual pursuits so much as to briefly tell of a simple experiment recently made, and of its results, in the hope that similar attempts may be suggested by it to those who take upon themselves the care and culture of pupils from beginning to end of term.

The school I have in mind is one with long-standing traditions of a flourishing Essay and Natural History Society among the senior boys; the staff had seldom been without an enthusiast to assist and encourage the work, and among the boy members many a naturalist had been discovered. The country for ten miles round provided scenery and hunting grounds of every kind, mostly free to the boy rambler, and the school premises themselves were inhabited by many species of plants, insects and birds.

Whilst the juniors had on a few special occasions attended the meetings of the senior Society, and had shared the prizes for drawing, collecting and joinery, they had had no organisation of their own up to this time. The senior meetings had become unusually frequent and successful, and regrets were expressed that the juniors should miss so much benefit and enjoyment. But, in addition to this, it was pretty generally noticed that the young boys needed some "objective"; not that they were badly behaved, but with their extremely high spirits, and minds active above the average, it seemed as though the daily hockey or cricket was not sufficient for their energies.

Their ages ranged from nine upwards. Many of these boys spent a good deal of time every evening in writing impositions or clearing off lesson arrears. If they could be brought to look upon all these leisure hours as their own, as times for real enjoyment, it was clear that a great victory might be won. To impose heavier tasks, at best a poor method, would have been one remedy, but it was felt that some more constructive treatment might be found to turn the young energy into its right course, and prompt dealing was needed.

One evening an informal "talk" with the boys took place, three or four of the staff being present, and a proposal was made to form on the spot a Junior Essay and Natural History Society. Its objects were shortly set out, and a plain understanding come to that, though not in the bond, it was to be a "No Punishment Society." The idea "caught on." Forthwith was elected a boy President and Secretary, and volunteers promised papers for the first meeting; but there was one element there without which the freshly-kindled zeal would soon have cooled—a determination on the part of the teachers of these classes to help on the effort, and sacrifice their own time to it. And so the start was made; the "whips" kept reminding the essay writers of the approaching meeting, and every day, either just after dinner or evening worship, a minute's muster of members was held by the headmaster, to ask "how many have had no punishment?" The constant reminder very soon began to tell upon the boys' daily conduct; frequently "no punishment" was reported; sometimes, it is true, a collapse seemed certain, but perfection was not insisted upon, and a steady improvement set in.

When the time came for holding the first meeting there was much glee at the importance of the occasion. The "business" was left almost entirely in the hands of the President, and the papers, though short, were well read, the subjects being chiefly personal experiences, excursions and holidays. A class teacher had helped and advised the composers, and many of the papers had been carefully re-written. After such a happy beginning, several similar meetings followed, as material offered, and as the evening hours were more and more taken up with preparation of essays the punishment list decreased noticeably. Once or twice an "example" had to be made of a forgetful member by forbidding him to attend a meeting, and perhaps the effect was wholesome all round.

As spring and summer approached, there seized upon the young Association a rage for natural history, thanks to the industry of a botanist on the staff who had been giving a course of practical "flower-talks" to the youngest class as part of the school curriculum, with the result that their appetites had been sharpened for field work. A "flower list" had been kept from mid-winter, posted in a corridor, giving dates of first appearance, English and Latin names and "finders," and the labelled specimens were exhibited in window bottles. To have one's name entered as first finder for the season was considered a great honour, and it often happened that half-opened buds were brought in by rival collectors, and "sunned" into blossom by lawful means for the credit of the botanist.

Shortly before the summer holidays the Junior Association

held a "Natural History" meeting, afterwards known as "the Botany evening," when there were present three or four of the staff and the headmaster. The subject—"Fertilisation by Insects"—was introduced in a paper by a member of the staff, after which came a series of what may be called "Nature stories" by the very youngest members, one or two not being more than nine or ten, who took each a single flower for description, handing round specimens in illustration, and occasionally using the blackboard. Their evident interest in the plants, and the astonishing fluency of more than one, convinced all the adults who heard them not only that a higher level had been reached than at any previous meeting, but also that here was a great factor in the development of mental power and the formation of character impossible to find in the examination syllabus.

At the "Leisure Hour" exhibition, held just before the holidays, some of the collections of leaves and shells were by junior boys, and represented many country walks and hours spent at preparing, mounting and naming. Those who had initiated and worked out the experiment concluded, rightly, that it had largely, at any rate, been a success—firstly in turning the current of boys' high spirits into useful channels, and thereby giving them a truer conception of school life; and, secondly, in helping the growth of a higher moral tone, largely through the nature of the pursuits encouraged.

But I may note, further, one of the most helpful results for the teacher—the correlation of school lessons and leisure-hour occupations, the usual divorce between which in the schoolboy mind often produces a feeling and behaviour far from desirable. Taking, for instance, the literary evenings, probably the voluntary essays read at these times were of very great help in the more formal English lessons in the class-room, and the composition much more natural than a formal exercise. Then the class botany lessons must have quite failed in their object if they had not developed a love for nature out of doors. And yet more—in a school where games were practically compulsory, and with little exception the delight of all—the spirit fostered by these other occupations acted as a most wholesome restraint upon "athleticism," and provided healthy material for thought and conversation.

EDWARD GARNETT.

Aberystwyth.

The School World.

A Monthly Magazine of Educational Work and Progress.

EDITORIAL AND PUBLISHING OFFICES,
ST. MARTIN'S STREET, LONDON, W.C.

Contributions and General Correspondence should be sent to the Editors.

Business Letters and Advertisements should be addressed to the Publishers.

THE SCHOOL WORLD is published a few days before the beginning of each month. The price of a single copy is sixpence. Annual subscription, including postage, eight shillings.

The Editors will be glad to consider suitable articles, which, if not accepted, will be returned when the postage is prepaid.

All contributions must be accompanied by the name and address of the author, though not necessarily for publication.

The School World

A Monthly Magazine of Educational Work and Progress.

No. 38.

FEBRUARY, 1902.

SIXPENCE.

INSPECTION AND EXAMINATION OF SCHOOLS.

By the Rev. T. W. SHARPE, C.B., M.A.

It may safely be assumed that the officers of the Board of Education have deliberately adopted their method of inspection, and that future inspections of schools above the elementary grade will follow the lines which they have prescribed for themselves. Several counties have already submitted all schools, aided by grants from their Councils, to their inspection; they have received many valuable hints, which will be carefully considered when the Councils shall have received larger powers for the erection and maintenance of properly equipped and well housed higher-grade schools. At present the Councils can only reply to their criticisms by shaking an empty purse in their faces; you should provide larger playgrounds—no money; larger cloakrooms—no money; you must not use a building designed for evening classes for a day school—no money; the old-fashioned grammar-schools, which have done such excellent work in the past, must give way to more modern systems of education, which shall retain the humanities and recognise in addition the claims of science and technical work. It is to be hoped that the cry of an empty purse will soon cease, and all much needed reforms will come to pass.

Let me put in a plea for private schools not being submitted to the same tests in all particulars as schools aided both in the provision of buildings and in annual maintenance by public bodies. They cannot be expected to rival their public competitors in finance, or in buildings, or in costly apparatus; we shall be glad, they say, to be tested as to the healthiness of our surroundings and the value of our teaching on equal terms with the public schools. So long as delicate and dull boys exist there will always be need for private schools. It is possible that some educational corporations may request to be recognised as inspecting bodies; no body of Englishmen whose business is education would claim to adopt a lower standard of health and education, though they might recognise a more humble equipment; above all, scholarships from the public purse should be as freely open to the good private school as to its wealthier neighbour.

Another point should be noted, that the new system of inspection carries with it no power of assessing money grants, though their deliberate judgment carries with it the just influence of their office. The office of the elementary-school inspector carried with it necessarily some odium; the uncertainty of the grant created some forebodings in the minds of managers and teachers; a manager of a large school once told me with some heat that if his school had been on the other side of the road in which his school lay, it would have been receiving through a different inspector £80 more annually for some years past. Too much authority is dangerous for us all, and certainly the power of recommending the refusal of half the annual grant was dangerous for some inspectors. The rarity of complaints showed that upon the whole the grants were judiciously assessed; yet I am very glad that no such power is likely to be conferred upon the inspectors of higher schools. They must not expect, however, that their searching methods of inquiry will not involve some obloquy; an Englishman's character is one of the dearest of his many castles within which he sits entrenched; and judgment of his work is in a special sense a judgment of his character. Not long ago, as I was approaching the entrance of a large public school, the headmaster handed me a note from a member of his staff to the effect that my presence in his class-room would necessarily entail his resignation; in twenty minutes we were sitting side by side in his class-room mutually admiring each other's methods.

The duties of inspection and examination supplement each other and cannot be separated; the mere inspector, who keeps his mouth entirely closed, cannot satisfy himself whether an excellent ideal scheme of education may have been marred by inefficient teaching; the examiner, who does not carefully grasp the purpose and aims of the scheme, both as a whole and in its details, cannot ascertain by a brief examination how far the whole or its parts have contributed to a successful result. The history of public elementary schools from 1860 to 1890 proves the futility of examining into details without a general knowledge of the whole plan. The inspection was overshadowed; time could not be found for any work but a meagre inquiry into details. Before 1860 full liberty was allowed and was freely taken; one of the wittiest of

men and wisest of inspectors, Mr. Brookfield, would select one class, riddle it through and through with a stiff examination, inspect the time-table of work thoroughly, and form his judgment of the school work on the conduct of that particular class; Matthew Arnold would found his judgment almost entirely upon the English taught, especially upon the construction of an English sentence, though he might modify his report by the suggestion of his able assistant.

It may astonish the inexperienced to learn that the financial position of the school has been the first consideration in the reports. Business men will cordially appreciate this precedence given to finance; educational men, especially the clergy, have always shown a magnificent contempt for the due provision of school maintenance. I believe that at this moment nearly all (if not all) of the twelve university colleges subsidised by the State are insolvent. Indeed, the history of the last sixty years of English education consists largely of the foundation of institutions which have failed to fulfil the hopes of their founders. They saw as in a mirage a succession of faithful disciples passing the torch from hand to hand; but their children have in many cases proved backsliders; they may boast that some of their enterprises have succeeded, and are certainly more fortunate than the university teacher who established a new cult and gained one disciple, but that disciple gained none.

Some one, or more, of the four chief financial requirements has generally been insufficiently provided for in the annual budget: the maintenance of the buildings and apparatus; a sufficient salary for a capable head teacher; the provision of a sufficient lump sum for the head teacher to engage an adequate efficient staff; a modest provision for retiring pensions. The last, though not the least pressing, is as yet barely recognised; the first and third are treated with a *laissez-aller* cheese-paring; neglect of the second would be suicidal, and is generally the one point carefully considered.

The second point of inquiry seems to be the provision of properly equipped buildings. We encounter in the reports condemnation of many makeshifts, rooms which attempt to serve a double purpose, while serving neither effectually; art rooms, laboratories, central halls, corridors, pressed into unlawful use. The proper condition of things requires a suitable number of class rooms exclusive of rooms reserved for specialists. Cloakroom accommodation is almost invariably deficient; the amount of space is calculated for the summer months, with an entire disregard of the wraps, cloaks, greatcoats and wrap-rascals provided by careful parents against the wintry blasts.

One very common evil is the omission of a fair-sized room for the comfort of the staff. They require a quiet, well-lighted apartment for the correction of exercises and for the revision and preparation of work during the hours in which their class rooms are occupied by the French or German or other visiting masters, or in the hours spent by the class in manual work. Higher work such as essays should be judged at home, when

reference can be made to authorities, but the bulk of the correction of exercises should be done in the teacher's room, and in school hours if possible.

We find complaints in the inspectors' reports of defective appliances in chemical and physical laboratories; of central halls used as a double class room with the additional nuisance of the hall being a common passage-room; of the invariable size of class rooms and the want of attention to smaller rooms being necessary for the youngest scholars, and for the other end of the scale, the sixth classical form, the advanced mathematical, modern-languages and science forms. The inspectors sometimes scold us because the rooms are too crowded, and therefore ill ventilated; sometimes they find fault with a room which owing to its size is full of echoes and draughts.

But let us now turn from all these preliminaries to the real work and ask ourselves what is the aim and purpose of the scheme of education professed in this particular school? I observe with satisfaction that the term "secondary" does not occur in any of the reports that have fallen under my notice. The term "secondary" has been very useful in the past as indicating the existence of schools above the elementary class, but it also carried with it the assumption that there was a general uniformity of purpose and therefore of subjects taught in all such schools. We need much more freedom for higher teachers; schools must be differently treated; one school may require two modern languages, another only one; algebra may well take the place of arithmetic; the selection of science subjects in the lower and upper forms must vary, and the time devoted to each subject of instruction will necessarily vary. This freedom appears to be recognised by the inspectors; no doubt we all hope that under this freedom general enthusiasm may hammer out the best curriculum for similar types of schools. The inspectors are content at present with the vague remark, "the curriculum appears to be on the whole both suitable and satisfactory," but on neither point do they shed any dry light of reason or experience. Again, "the number of hours (17) given to science and mathematics leaves little leisure for English subjects and languages"; I believe that they are attacking the mother that bore them, and that this faulty arrangement is due to the action of the Science and Art Department before it was in any way remodelled. Again, "the time-table seems to be carefully drawn up"; but there is no indication in which direction carefulness has been shown. Again, "the divisions of time between the various subjects of instruction have been very fairly used"; but they avoid any indication of the fairness displayed. We must all rejoice that they have left the exact shaping of the curriculum to the common sense of English teachers; though they seem to infer that they can produce from their pockets, conjuror fashion, an ideal curriculum, suitable with certain modifications for all schools.

Their reports, however, on individual subjects founded upon lessons or examination by each in-

dividual teacher, or their own examinations, are full of valuable suggestions, and there is no pretence of speaking from a higher level; full credit is given for each subject well taught and for all special excellences; the friendly plainness of the criticisms disarm all angry rejoinders. They feel, no doubt, that they are conducting a new system of inspection on a higher plane than formerly, because they carry with them no money penalties or prizes; they claim only the respect due to their high office of counselling and directing the future destiny of the coming rulers and the coming mothers of the English race. Nothing has prejudiced the inspection of elementary schools in the eyes of English teachers so much as criticism framed to justify the reduction of the annual grant. Such a report as the following, "arithmetic has been well taught, but history with only moderate success," seems framed to justify the purpose of withholding some part of the annual grant. Happily, no such practice can now prevail, but annual grants should not be made to depend upon a short visit from inspectors, but should depend upon tests showing the general character of the work throughout the year.

I have not left myself sufficient space to set out at length the details of the examinations; but I will notice that in modern languages *viva-voce* examinations are dwelt upon as of greater value than examinations in grammatical accuracy, and that written answers are regarded as more valuable to the teacher than to the examiner, and that generally more reliance is placed upon the examinations and lessons of the teachers than upon their own questioning. I have myself a strong conviction that very little personal examination is needed, and that an examiner wastes his time in lengthy questioning merely to satisfy the teachers and the class that the knowledge of the scholars has been thoroughly tested.

THE STUDY OF "A MIDSUMMER NIGHT'S DREAM" IN SCHOOLS.

By C. L. THOMSON.

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"A MIDSUMMER Night's Dream," which is the play set for the Cambridge Local Examinations for 1902, is not at the first glance one of the most suitable for study in schools. It does not possess the patriotic interest of the English historical plays; it does not readily connect itself with knowledge gleaned in classical lessons, for the half mythical Theseus is a far more shadowy personage than Cæsar, or Coriolanus, or Mark Antony; and the characters of the lovers are so slightly sketched that it is difficult to feel any great interest in their fortunes. Then, again, the love interest is predominant, and healthy-minded boys and girls are apt to turn from love-making in half-

shamed distaste; the brave heroic speeches of Henry V. or Brutus, or the fierce tragedy of Macbeth, would be far more acceptable to them. And by the time they are ready for the study of Shakespeare they have passed the age which takes for granted the existence of elves and fairies and revels in stories of their doings, while they are not yet mature enough to take unaided an æsthetic delight in the beautiful poetry of the fairy scenes.

On the other hand, where the faculty of literary appreciation exists, albeit in a very undeveloped condition—and I am inclined to think that it is present in far more cases than are suspected, because we stifle it so early by our ill-advised methods of teaching literature—no play is better fitted to call it out. If "A Midsummer Night's Dream" deals rather with shadows than realities; if these lovers, meeting and parting in the glimmering night, are moved only with the semblance of passion, and appear almost as impalpable as the twilight which envelopes their caprices, and far less vigorous and individual than the spirits who control their fates; yet this world of dreams is excellently fitted to bring out the latent poetry in the pupil who naturally sympathises with the invisible world, and to awaken in others a sense of the mystery and romance that lie around them. "The best in this kind are but shadows; and the worst are no worse, if imagination amend them"; and "A Midsummer Night's Dream" affords a most valuable opportunity for the teacher to develop that power of imagination which glorifies daily life and suffuses commonplace scenes and incidents with the wonder of the unknown.

But if this is the case, every teacher who undertakes to study with his pupils this beautiful play—an appreciation for which may almost be taken as a criterion of literary taste—must put before himself and them, not primarily examination results, though if the text be intelligently studied, these will no doubt be quite satisfactory, but the resolution to develop this æsthetic sense and to lead his class a little way into the wonderful garden of romance which will prove so sweet a refuge in later years. For, after all, what does it matter whether a boy remembers that Shakespeare uses *lingers* as a transitive verb, or that the word *gleek* is derived from the Old English *ge-lacan*, Gothic *laikan*, so long as he does not forget to turn to Shakespeare as one of the wisest and most stimulating authors who ever lived?

But as practical teachers we must also attend to the other purpose. We want our pupils to love the book, but we want them also to pass their examination, and we must therefore try to reconcile both aims. How can we do this, and what method shall we pursue, so as to ensure a sound knowledge of the play without leading them to regard it mainly as a "school book" to be thrown aside as useless when the examination is over? It is hoped that the following suggestions, the result of many years' experience in teaching literature, may be of service.

The first few lessons should be devoted to reading the play straight through in class. And here I would put in a plea that the copies used at first

should contain only the text and no notes. Annotated editions lend themselves so easily to "cram" work, and though they are essential to the teacher from the first, they need not be put in the hands of the pupils till the last term, and in the case of junior pupils they are hardly necessary at all. Who that remembers his own school days can forget the disgust caused by the crowded pages of notes in small print which played so large a part in the literature lessons of fifteen or twenty years ago? And though the school editions of the plays are vastly improved, they explain far more than is necessary, and tempt both teachers and taught to lazy, mechanical methods, when they should be working and thinking for themselves. Any teacher of average, intelligent boys who will look down a page of the notes appended to one of these editions will probably find that by a little judicious questioning he could have elicited from his class two-thirds of what is here put down in plain black and white, to save him from the trouble of questioning, and them from the trouble of an easy mental effort which could bring only pleasure with it.

We begin, then, with our plain text, and read the play straight through, just for the story and the dramatic interest, not lingering to explain words or allusions, except where these cause manifest obscurity. After each lesson the pupils may write for "preparation" an outline of what they have read; this will help them to keep the plot clear and fix it in their memories. It is a great pity that so many school editions give a ready-made outline of the story; this is surely supposing an extraordinary want of intelligence in the reader, and in my own experience I have never found the slightest difficulty in getting good accounts from the class.

This preliminary reading will probably occupy about eight lessons, which, in the case of junior pupils, brings us to about the fifth week of the first term. In the case of senior candidates so much time can scarcely be spared for reading in class, and they may be trusted to read about half the play in preparation, the teacher ensuring that this has been done by questions on the subject matter at the next lesson. The story being now known, the regular study of the play begins.

If we consider the types of questions usually set in these examinations we shall find that they may be classified roughly under the following heads: estimates of the characters, obscure words and allusions, points of Shakespearean grammar, versification, sources of the plot, and probable date of composition. Scarcely any questions occur which test the pupil's individual capacity for the enjoyment of poetry, so that in trying to develop this we must regard our efforts as rather beyond the scope of the examination. My own conviction, however, is, that once this is awakened, all the rest follows as a matter of course.

To take first the characters of the play. Here, again, the inevitable "appreciation" generally prefixed to school editions is apt to come between the pupil and the original, for who will trouble to think out for himself a matter that is so conveniently and concisely stated in the introduction? How much

easier to learn off by heart half a page of criticism than to form one's own opinion on a somewhat difficult subject! But to encourage this is the method of the crammer, not of the educator, and educators, therefore, would do well still to adhere to their plain text. The play must once more be read through with the class, but much more slowly than before, and with regard especially to questions of characterisation, difficult words and allusions, and versification. It is a good plan to provide each pupil with a large notebook, divided under these different headings, beneath which he can note down anything he has observed or has had explained to him during the course of the lesson.

In "A Midsummer Night's Dream," as I have already remarked, the characterisation is slight and affords little material for original observation. Among the mortals, Theseus and Bottom are indeed the only two who are endowed with very definite characteristics. But something can be done with them. Read the first scene of the play with the class and ask them their opinion of Theseus; you will probably get little at first beyond a remark that he is "rather decent"; but ask them the reason for this favourable verdict, and make them point out passages to support it, and something more definite will result. How does Theseus treat the case of Egeus? Was this a suitable time to bring the matter before him? How does he behave to Hippolyta? Had he always behaved to her in the same way? What does his courtship of her prove with regard to the character of both? What is the attitude of Theseus towards the laws of his country? By means of some such questions the pupils may arrive at the conclusion that Theseus is a king who has a high ideal of his office, for he is ready to put aside his own absorbing private affairs to perform its duties; that he is a loving bridegroom, but will be the master of his wife, for has he not "won her love doing her injuries"? That Hippolyta, the Amazon, is a high-spirited woman not easily subdued, and that Theseus is a type of the strong, law-abiding king, since even Hermia's youth and beauty cannot induce him to relax the ancient decrees of Athens. These outlines may be developed in succeeding scenes, notably in the last of the play, where, when Hippolyta pities the players for their "wretchedness o'ercharged," he, with larger sympathies, regards the intention rather than the performance, and is grateful for even this grotesque manifestation of loyalty.

In the same way the pupils may form their own opinion about Bottom. He wants to play all the good parts himself; he is always putting in his word and interfering with Quince's prerogative as stage manager. He is equal both to "condoling in some measure" and to "roaring like a lion," and when it is objected that this will frighten the ladies, he declares that he will "roar as gently as any sucking dove." Yet in spite of his self-confidence, he is managed by a little judicious flattery. What does all this indicate about his character, and how is it borne out in succeeding scenes?

The same method may be followed in dealing with the fairy element. Many school editions give

a separate appendix or essay on the characteristics of Shakespeare's fairies, but there is absolutely no reason why the pupils should not discover these for themselves. What does the play tell us about the fairies? They are airy unsubstantial beings, for they can wander through flood and fire; they are very small, for to them the cowslips are tall, and acorn cups are fit hiding places. They have a king and queen, and the king has his jester. They have no real sense of right or wrong, but act according to whim or impulse; yet, when their love of mischief does not predominate, their impulses are good (e.g., they will make all right between the lovers, but they do not mind tormenting the breathless housewives or misleading weary travellers). All this and much more is written in the play, and it is therefore quite unnecessary to repeat it in some other part of the book; a little guidance on the part of the teacher is all that is wanted to lead the class to these results. In connection with these fairy scenes, if there is time, the teacher may read aloud scenes from Drayton's "Nymphidia," some of Herrick's poems, scenes from Berner's translation of "Huc of Bordeaux," and Bishop Corbet's "Fairies' Farewell"; and to the older pupils may be given, in addition, the charming essay on "The Fairy Mythology of Shakespeare," in Nutt's series of Studies in Mythology.

Meanwhile, in the course of gleaning from the play these facts about the characters, many obscure words and allusions will have been noticed and explained, some of them by the teacher, others by a little thought on the part of the pupil. For example, the first act opens with these lines:—

Now, fair Hippolyta, our nuptial hour
Draws on apace; four happy days bring in
Another moon: but O! methinks how slow
This old moon wanes! *She lingers my desires
Like to a step-dame or a dowager
Long withering out a young man's revenue.*

In most school editions the words in italics are carefully explained by a long note, but I think it probable that half the class would understand such a passage without any comment, and with a little guidance the rest would easily arrive at the meaning for themselves. What is a "dowager" and what is a "revenue"? And why should a young man's revenue be diminished by a dowager? The majority of such difficulties will yield to similar treatment, and the very fact that an appeal has been made to the intelligence of the pupil will fix the meaning in his memory and stimulate him to further effort. The meaning of obscure words, such as *gawd*, *neif*, *pellung*, *gleek*, &c., must be given dogmatically, but I would deprecate the custom of learning derivations by heart, especially the derivation of such words as come from Teutonic sources. With regard to Romance words, especially those borrowed direct from Latin, it is possible that some pupils may have enough knowledge of the foreign language to justify the tracing of the relationship; but it is really mischievous to give a boy or girl an Old English word as the parent of one used by Shakespeare, when it is impossible to teach the laws which have

determined its development into the Shakespearean form. A slight mistake in spelling is sufficient to make the derivation quite ridiculous, and few teachers are sufficiently well trained in Germanic philology to recognise the enormity of such blunders. Philology is not a subject for the school-room, neither—if I may dare to give utterance to so heterodox an opinion—is the study of Shakespeare's syntax. But as scarcely a paper is set without some question on grammatical points, I suppose we must consent to draw attention to ethical datives, impersonal constructions and the like.

The worst of giving so much attention to these points of language is that it leaves us little time for the consideration of other matters which tend in a greater degree to the æsthetic appreciation of the play. We are so much absorbed with grammar that we overlook the felicity of metaphor and simile, and never stop to show how a single epithet can conjure up a world of beauty and romance. I am aware that such subjects do not come within the scope of the average examination paper, but so much pleasure may be gained by a discussion of these points that it is worth while to linger over them. Why are the primroses called *faint*, and the choughs *russet-pated*? What is meant by *spangled* starlight, *hempen* homespuns, *nodding* violet, *shaping* fantasies? I insist all the more on this point because I have so often discovered misconceptions to exist where one would not have suspected any difficulty. *Storied urn* has been explained to me as "an urn with two storeys," and *pale-faced villages* as "villages in which all the houses are whitewashed."

The subject of versification will require at least one lesson to itself, but the laws of Shakespeare's blank verse having been supplied, illustrations may be gathered from the text in the course of the second reading, and the pupils themselves can discover instances of variations of stress, run-on lines, feminine endings, use of rhyme and prose, and can suggest reasons for the presence of such variations. Now, too, may be considered the characteristics of the verse of Shakespeare's early plays as compared with that of his later ones, and from these data the class may draw their own conclusions as to the period at which "A Midsummer Night's Dream" was written. They will be delighted when they find that their conclusions agree with those obtained from the other evidence for the date of the play.

When the book has been read through a second time with especial regard to these points, a good annotated edition may be put into the hands of the pupils, and from this they may "get up" by themselves the remaining evidence for the date, and the necessary information as to the sources. With advanced pupils the subject of the construction of the play and the question of the unities also call for consideration. The best annotated editions of "A Midsummer Night's Dream" for senior candidates are the Pitt Press¹ and the Warwick

¹ *The Pitt Press Shakespeare*. "A Midsummer Night's Dream." Edited, with introduction, notes, glossary and index, by A. W. Verity, M.A. (Cambridge University Press, 1900.) 1s. 6d.

Shakespeare.¹ The latter contains almost too much information for pupils of school age, and is more suitable for students of university standing, but as aid to the teacher it is invaluable. The introduction to the Clarendon Press edition² is also to be recommended. For junior pupils Black's "School Shakespeare"³ is very suitable; the introduction and notes are clearly and concisely arranged, and the text is particularly well printed. Another very good edition is that by K. Deighton, published by Macmillan,⁴ while that by the Rev. H. N. Hudson, published by Ginn,⁵ contains some valuable hints for the teacher. But at the risk of being tiresome, I must reiterate my opinion that none of these excellent editions should be given to the pupils until the play has been twice read through with only such external aids to its understanding as may be given by the teacher. For our aim, after all, is to make the pupils think for themselves, and few examiners are so misguided as to prefer an answer which obviously depends on an effort of memory to one that betrays signs of independent thought. Such answers are particularly refreshing amidst the mass of mediocre and mechanical work that is the ordinary result of a year's study of Shakespeare, and I am convinced that they might be much more frequent if our method of studying his plays were somewhat different.

I venture to add some questions on the text framed with the especial view of encouraging independent thought on the part of the pupil.

- (1) Determine, from the versification of "A Midsummer Night's Dream," the probable date of its composition. Give instances to support your views.
 - (2) Show how Shakespeare varies his verse according to the nature of his theme.
 - (3) Account for the predominance of rhyme in this play.
 - (4) Illustrate from "A Midsummer's Night's Dream" Shakespeare's use of prose.
 - (5) What allusions to contemporary drama occur in this play? Does it throw any light on Shakespeare's own opinion of his profession?
 - (6) Describe, with illustrative quotations, the characteristics of Shakespeare's fairies.
 - (7) Trace the influence on this play of the following works: (a) Chaucer's "Knight's Tale," (b) "Huon of Bordeaux," (c) Ovid's "Metamorphoses," (d) Plutarch's "Life of Theseus."
 - (8) Sketch the character of Bottom, illustrating your remarks by quotations from his speeches.
 - (9) "In Theseus we recognise the leading features of Shakespeare's ideal of sovereignty." Examine this statement.
 - (10) "The country bred youth's whole feeling for and knowledge of nature comes to the surface in 'A Midsummer Night's Dream.'" Discuss this statement.
- Or Illustrate from this play Shakespeare's close observation (1) of birds, (2) of animals, (3) of flowers.

¹ *The Warwick Shakespeare*. "A Midsummer Night's Dream." Edited by E. K. Chambers, M.A. (Blackie, 1897.) 1s. 6d.

² *Clarendon Press Series*. "A Midsummer Night's Dream." Edited by W. A. Wright, M.A. (Clarendon Press, 1894.) 1s. 6d.

³ *Black's School Shakespeare*. "A Midsummer Night's Dream." Edited by L. W. Lyde, M.A. London. (A. & C. Black, 1897.) 1s.

⁴ "A Midsummer Night's Dream." With an Introduction and Notes by K. Deighton. (Macmillan.) 1897. 1s. 6d.

⁵ "Shakespeare's A Midsummer Night's Dream." Edited by the Rev. A. Hudson, LL.D. (Ginn.) 1889. 1s. 6d.

(11) Illustrate the union of classical and romantic ideas in this play.

(12) Examine the appropriateness of the following expressions:—*russet-pated choughs*; *hindering knot-grass*; *hempen home-spuns*; *the cowslips tall her pensioners be*; *but the imperial votaress passed on, in maiden meditation fancy-free*; *plain-song cuckoo*; *luscious woodbine*; *there the snake throws her enamelled skin*; *the shallowest thick skin*; *fond pageant*; *a red-hipped bumble-bee*; *long-legged spinners*.

AGRICULTURAL SCIENCE FOR THE CAMBRIDGE LOCAL EXAMINATIONS.

By A. D. HALL, M.A.

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TO many schoolmasters of the older learning it must have been something of a shock to find "Agricultural Science" included among the subjects of the Cambridge Senior Local Examinations for 1902. The teaching of Chemistry and Physics in schools was bad enough, concessions to a utilitarian age fonder of seeming short cuts to money-making than of mental discipline, but what—they ask of all their gods—has a school to do with the formation and management of permanent grass-land, the feeding of farm animals, or the compounding of typical rations for feeding stock! (*vide* Schedules for 1902, p. 14). There are, indeed, teachers of agriculture who, purely in the interests of their own subject, are of much the same opinion, who consider that to teach a boy agriculture in school gives him just the kind of mental conceit, that substitution of the thing read about for the thing done, which makes him a very bad learner when he comes to the real business. They even consider that, as the English farmer is the best master of his craft in the world, the practical part of his son's instruction might be left to him, when the boy's educational period is short; and whatever time can be spared for the technical in school would be better employed in giving a boy such exactitude of mind as comes from a thorough, if short, piece of work in some physical science.

However, these be opinions, and in educational matters in England one man's opinions are as good as another's; the practical point remains that sundry schools have been forced or bribed into teaching Agriculture, and the University of Cambridge, with sound commercial instinct, is ready with its examination wares to meet the probable demand. The syllabus which has just been issued is called Agricultural Science, and is divided into two papers of very different type, the first of which might be described as vegetable physiology; the second is more in the nature of practical agriculture.

The scientific part, Paper I., can easily be made a very attractive school subject, which will provide material of real educational value for any school with access both to a laboratory and a garden. An initial knowledge of chemistry should be regarded as essential; at least as much as is covered by the

Preliminary Chemistry Schedule is necessary for mere understanding of much of the work, and this minimum might well be extended to the Theoretical Chemistry Syllabus for Juniors.

The Schedule, in fact, opens with Chemistry, with a discussion of the ultimate composition of plants and the detection of certain elements in them and in the soil. Warrington's "Chemistry of the Farm" (Vinton, 2s. 6d.), in its opening chapter, will suggest a useful way of beginning the course of instruction; there is set out the composition in pounds per acre of a crop of meadow-grass cut for hay. Being mixed herbage it is fairly typical of plants in general; later in the same book come the quantities of the leading elements present in all the main crops of the farm, from which the teacher should prepare a set of diagrams to illustrate the normal differences exhibited by grain, leaf, and stem, cereals and leguminous plants, &c.

The tests for the various elements in plant and soil present no difficulty to the boy who has already done some practical chemistry; unless it be the detection of potash in the soil, which needs either the careful removal of the bases other than the alkalis or the free use of platinic chloride.

After considering the elements present in the plant it is desirable to review the chief organic compounds that will be met with in the later discussion of the growth of the plant and the feeding of the animal; such carbohydrates as the commoner sugars, starch, pectose, and cellulose must be known and lend themselves to simple laboratory experiments. Some of the properties of fats and of proteids should also be studied, and one or two of the organic acids. The chapters of Wood's "Agricultural Chemistry," vol. ii. (Kegan Paul, 5s.), could be worked through by boys to this end.

Water cultures are next mentioned in the syllabus; and some considerable care in manipulation is necessary if boys in class are to make them yield satisfactory results. The teacher should prepare beforehand ten-per-cent. solutions of the necessary salts—sodium phosphate, potassium sulphate, sodium nitrate, magnesium sulphate, calcium chloride, &c.—so that the culture fluids can be made up by measuring and dilution, for the weighing out of the small quantities of salts required by each boy takes an inordinate time. Each boy should make up one culture, and the various combinations should be assigned to different boys; *e.g.*, boys A and B should make up a complete culture fluid, C and D should omit the nitrogen, E and F the potash, &c.

For the many details necessary to success Percival's "Agricultural Botany" (Duckworth, 7s. 6d.) should be consulted; indeed, this book will give the best guidance to the teacher in arranging class experiments for most of the work that follows.

The next section, on the functions of leaves, can be made the subject of varied experiment of great educational value; transpiration in particular can be demonstrated and even measured in several charming ways. Assimilation must be shown by more indirect methods, dependent on a knowledge of the composition and tests for starch, but one

straightforward experiment may be done as follows: a hundred or two specimens of some large and regular leaf, *e.g.*, vine, hop, sycamore, are collected some hours after dark, from which pairs of approximately equal size as judged by the eye are rapidly sorted out. Two heaps are made, each containing one member of all the pairs, thus in the end with a hundred or more leaves the two heaps will closely approximate both in area and weight of leaf. One heap is at once placed in the oven and dried; the leaves of the other are stuck in jars of water and exposed to the light for all the following day, at the close of which they are likewise dried. The leaves that have been exposed to light will show a well marked excess of weight owing to assimilation.

Roots and stems, the structure and function of the flower, fruits and seeds, may be well studied in Prof. Percival's book, which contains some excellent exercises for class use in these matters. Germination forms a very suitable subject for practical work by boys, as simple experiments can be arranged to show the dependence of germination upon air, the various respiration effects, and the movement of reserve material in a starchy seed.

Propagation by vegetative methods ought to be the subject of considerable study, and can be made exceptionally interesting. It demands a garden, and should begin in the early autumn by the dissection in class of bulbs of tulip, hyacinth, colchicum, and crocus corms; these are planted and specimens dug up and dissected from time to time until the formation of the new bulbs is complete. A little later in the year cuttings of hardwooded plants, like currant trees, briars, paradise apples, should be planted, and observed later for the callusing process and the formation of roots. The growth of soft-wooded cuttings in spring, the processes of grafting, budding and layering should be practised by each boy, and form excellent exercises both for mind and fingers.

The section of the Schedule dealing with the soil is less suited to class treatment in school; partly because it is not very easy to devise simple experiments, and partly because unsolved problems abound; even about the rudiments research is still busy. But the teacher must speak with authority and can afford no time to discuss evidence, so may be recommended to use the first eight or nine chapters of Wood's "Agricultural Chemistry." Prof. King's (of Wisconsin) book on "The Soil" (Macmillan, 3s. net) and Warrington's "Lectures on the Physical Properties of Soils" (Clarendon Press, 7s. 6d.) will be useful as supplying further illustrations and an introduction to the debatable ground still under investigation.

So much for Paper I. of the Schedule. Paper II. contains also a certain amount of what may be called principles of agriculture—the properties of soil, the use &c. of manures, the principles of rotations and the theory of food rations—which can be taught in class in dogmatic fashion, experiments being rather beyond the resources of most schools. But the greater part of the second paper is agriculture proper, the cultivation of farm crops, the feeding of farm animals, the breeds of stock; here

teaching is little more than the summarising and criticism of the results of experience, and without the experience the teaching is little worth. As it is impossible that a schoolboy can be on the farm and about the stock with his teacher in the intimate and constant fashion that will supply the necessary experience, this part of the subject had better be treated as a piece of pure cram.

By way of stimulus and to create an interest in animals and agricultural processes, such books as Buchanan's "Country Reader for Use in Village Schools" (Macmillan, rs. 6d.) and Wrightson's "Principles of Agricultural Practice" (Chapman and Hall) may be read and talked over, but as the examination draws near the class should be drilled in the appropriate sections of Fream's "Elements of Agriculture" (Murray, 3s. 6d.). For the present it is impossible to guess how the examiner will read the schedule, and what conventions he will accept as representing "practical knowledge by their own observations and by experiments," but the text-book recommended speaks with the authority of the Royal Agricultural Society behind it. Nor need we despise from the educational point of view such a piece of cram as is involved. To be able to read a book intelligently, get it up rapidly, and reproduce it clearly and in order, is one of the most valuable faculties a man can possess, and one worthy of more deliberate cultivation in school, though indirectly it has always been a virtue of the examination system.

If it be objected that a boy soon forgets a subject so acquired, we must remember that it is the habit of acquiring and not the subject got up which is important for the boy's after life. As far as our immediate text is concerned, the sooner and the more completely a boy forgets the practical agriculture learnt in school the better for his after career as a farmer.

HISTORY OF THE BRITISH EMPIRE, 1492-1784.¹

By C. S. FEARENSIDE, M.A. (Oxon.).

"THOSE wretched Colonies," said Disraeli about fifty years ago, "will all be independent in a few years. Meanwhile they hang like a mill-stone round our necks." The great Imperialist's forecast has not so far been fulfilled; and the result is that there are still British Colonies hanging "like a mill-stone" round the necks not only of British statesmen but of British school-children. For some years past "the Empire" has been a prescribed subject for various elementary teachers' examinations; and

now the most influential of our curriculum authorities in secondary schools has followed the example of the Board of Education.

Two general remarks occur to us regarding the new departure. Here, as in one or two other innovations (*e.g.*, in the new regulations regarding spoken French and spoken German), the Cambridge Syndics show that they have the very praiseworthy characteristic of being open to advice. We have noticed a good many appeals to them to make their examination more "actual"; and these changes show that the appeals have not fallen on deaf ears.

Again, we think (the outside critic generally does) that the authorities might have done more. As in the case of the new departure at Oxford (see *THE SCHOOL WORLD*, October, 1901), we regret that the authorities are still moving about in the "special-period" fog. Why cannot they prescribe a whole subject instead of a fragment? The present Syllabus is curiously incomplete in several respects. On the front page of the regulations it is written, "The History of the British Empire has been made a subject of examination for both Seniors and Juniors." May we respectfully point out that this statement is untrue? So far, at any rate, only a part of this "history" has been prescribed. There are serious limitations in both space and time. The books recommended deal almost exclusively with "the British dominions beyond the seas"; and we submit that the British Empire without the British Isles somewhat resembles the play of "Hamlet" with the title *rôle* expurgated. And the "History of the British Empire" neither begins at 1492 nor stops short at 1784. We venture to think that the outlines of Britannic history during the Oceanic period would have been a better theme.

Perhaps, however, the Syndics mean to make this a permanent subject (as their title-page suggests), but to spread it out over two years—dealing with "Britain's First Empire" (to 1784) in one year, and "Britain's Second Empire" (1784-1900) in the second year. Excellent, but why not say so? This is a practical consideration. If the "Expansion of England" is going to be a permanent subject, it will be worth while for the teacher to set about seriously to equip himself, his library and the school-library for the task; but if it is going to be merely an intermittent or temporary subject, many may prefer to go on with the old routine subject of English domestic history. Could not the Syndics make a formal pronouncement, so that teachers might know whether it will be safe, from an economic point of view, to "plump" for the Empire?

The pressing questions resolve themselves into (a) books (and other appliances) and (b) treatment.

(i.) JUNIOR CLASS BOOKS.—It will be observed that the Syllabus does not *prescribe* books but merely mentions two books by name as indicating "the topics to be treated." This footnote is helpful in two ways. It tells us *what we may safely omit*; and that is a very important consideration in what, even in its truncated form, is a large subject.

¹ One of the three alternative subjects in History prescribed for the Cambridge Local Examination (Junior and Senior), December, 1902. "The paper will be on the topics treated of in Jose's 'Growth of the Empire' (Murray) or Woodward's 'Expansion of the British Empire' (Cambridge University Press), or any similar work."

And it removes the money difficulty. Allowing for discount, Woodward costs 3s. and Jose 4s. 6d.: for many schools these prices are prohibitory, especially considering that the alternative English history subject would involve no fresh expense. But it is not necessary to place either of these books in the hands of the pupils themselves, though it would certainly be desirable to choose one or the other (or both) for Senior candidates. But for Junior pupils, at any rate, there have recently come into existence a large number of small books (averaging about 1s. 6d. net) dealing with our subject. Most of these are anonymous compilations designed primarily, if not exclusively, for intending elementary teachers. But there are two such books by well known hands. One is "The Building of the British Empire, 1497-1900," by A. T. Flux, (Holden, 2s.), and the other is "An Outline History of the British Empire, 1500-1870," by W. H. Woodward (Cambridge University Press, 1s. 6d. net). Both these books are by practical teachers, and both strike us as worth consideration with a view to introduction. Mr. Flux's work is practically disqualified for our present purpose by the fact that he devotes only a third of his space to the period in hand. Mr. Woodward's book, which is written with more care but less "spirit," has two distinct advantages: it accords rather more space to the period before than to the period after 1784; and it is written on the same lines (largely in the same words) as the author's large work mentioned in the Syllabus. On the other hand, Mr. Woodward's book does not bring us down to the present day; and if the Syndics set the history of the "Second Empire" next year, his book (*in its present shape*) will be almost useless. It also lacks an index. The teacher would do well to examine both books and he will derive many useful hints from both; but he will probably find "little Woodward" the most serviceable as a class-book—if he finds it necessary to adopt a book smaller than those named by the Syndics.

(ii.) SENIOR CLASS BOOKS.—For Senior Candidates the choice practically lies between the two books actually named in the syllabus: Woodward has been introduced to readers of THE SCHOOL WORLD (June, 1901) in an extended notice, while Jose has not, I think, been reviewed in these pages. It may therefore be worth while to set forth the main features of the two books. Mr. Jose brings his story down to 1900. Mr. Woodward stops short at various dates between 1850 and 1877 (practically ignoring the recent "Colonial Renaissance"). Woodward allots about 230 pages, Jose about 170 pages to the special period with which we are concerned; and in the latter book the date 1784 is not a special landmark. Jose gives no bibliographical aids at all; Woodward, though he aims at "stimulating the reader to further enquiry," gives only a perfunctory sort of book-list to help him in that enquiry. Neither is cut-and-dried after the fashion of the ordinary historical manual; but Mr. Woodward writes definitely for school use, while Mr. Jose obviously writes for the citizen of Greater Britain. The fact that

Mr. Jose is an Australian and has personally visited South Africa frees him from a certain "Anglocentricity" which marks many books about the Empire. Emphatically, Mr. Jose's is the more complete and suggestive book for the general reader.

(iii.) BOOKS FOR COLLATERAL READING.—Even the best historical manuals must largely consist of "dry bones," and in order to make these live their readers must have recourse to "real books"—books which are "interesting" in themselves. These may be roughly grouped into two sets—those which the average boy or girl would be likely to enjoy reading out of school hours, and those which the teacher would do well to read as part of his preparation. Of course, these two sets overlap, and the division adopted below is somewhat arbitrary.

(1) For Pupils.—This list does not profess to fix either a minimum or a maximum, but it does not contain anything unsuitable for a school library.

(a) *Source Books*.—Elizabeth Lee, "Britain over the Sea" (Murray, 2s. 6d.); L. W. Lyde, "Sea-Dog Readers"—Drake, Blake, Hawke (Black, 3 vols., each 1s. net); E. J. Payne, "Voyages of Elizabethan Seamen to America" (Frowde, 2 vols., each 5s.); original narratives of the voyages of Drake, Dampier, Anson and Cook (various editions).

(b) *Biographies*: "Drake," by Julian Corbett (Macmillan, 2s. 6d.); "John Davis," by Clements Markham (Philip, 3s. 6d.); "Raleigh," by Martin Hume (Unwin, 5s.); "Blake," by David Hannay (Longmans, o. p.); "Dampier," by C. W. C. Russell (Macmillan, 2s. 6d.); "Wolfe," by A. G. Bradley (Macmillan, 2s. 6d.); "Rodney," by D. Hannay (Macmillan, 2s. 6d.); "Cook," by Sir Walter Besant (Macmillan, 2s. 6d.); "Clive," by Sir Charles Wilson (Macmillan, 2s. 6d.), or by G. B. Malleon (Frowde, 2s. 6d.); "Warren Hastings," by Sir A. Lyall (Macmillan, 2s. 6d.), or by L. J. Trotter (Frowde, 2s. 6d.).

(c) *Story Books*.—Froude, "English Seamen in the Sixteenth Century" (Longmans, 3s. 6d. and 6s., the latter being illustrated); Southey (edited by D. Hannay), "English Seamen—Hawkins, Clifford, Howard, Drake, Cavendish" (Methuen, 6s.); Mowbray Morris, "Tales of the Spanish Main" (Macmillan, 6s.); J. K. Laughton, "Sea Fights and Adventures" (Allen, 6s.).

(d) *Verse and Fiction*.—The Anthologies by W. E. Henley ("Lyra Heroica"), H. B. George and A. Sidgwick ("Poems of England"), H. F. Langridge ("Ballads of the Brave"), J. A. Nicklin ("Poems of English History"), and Clara Thompson ("Carmina Britanniae") abound in pieces illustrative of British colonial efforts. Prose fiction of such a kind as Kingsley's "Westward Ho" could not be treated at length in this place, and I dare not make a selection.

(2) For Teachers.—Suppose, remembering that teachers have not all very long purses and have many calls on them, we try to discriminate the necessary from the merely desirable.

(a) *Necessary Books*.—Let us assume that teachers are sufficiently interested in their work to have the source-books of Professors Colby and Kendall and Seeley's "Expansion of England." What books are they to get *ad hoc*? Here is my guinea parcel:—

	s.	d.
E. J. Payne, "European Colonies" ... (Macmillan)	4	6
A. B. Hart, "Source-book of American History" ... (Macmillan)	3	6
C. P. Lucas, "Introduction to Historical Geography of the British Colonies" ... (Frowde)	4	6
Sir A. Lyall, "Growth of British Dominion in India" ... (Murray)	4	6
H. J. Robinson, "Colonial Chronology" ...	4	0
—published at 16s., remainder about ...		
Total	21	0

Subject to 4s. 3d. discount, which will about pay for Jose or Woodward.

The first four are well known as "good wine" which "needs no bush." The last is a spacious date-book, well arranged, and with plenty of blank space for "teaching mems." It seems to be a good bargain at its present price.

(b) *Desirable Books* (mostly found in good libraries).—H. E. Egerton, "Short History of British Colonial Policy" (Methuen, 12s. 6d.), is the most generally useful large book. It contains a helpful, descriptive bibliography of the subject, which may be regarded as supplementary to the brief list in Woodward.

(iv.) TREATMENT.—I find I have left myself no space to discuss this matter; but, after all, the teacher who has the right spirit and uses the best available sources of information cannot go far wrong. It is important to remember throughout that we are dealing hardly at all with the very modern British Empire of to-day, but with a much more distinctly *English Empire*, altogether different in area and in ideas. Perhaps I may be permitted to refer new readers to the "Lantern Lecture Notes" on "The Beginnings of English Colonisation," by Mr. Evans and myself, in *THE SCHOOL WORLD*, March, 1900.

IN the present days of schools which charge—especially in the case of preparatory schools—fabulous fees, it may be interesting to glance at a quarter's account sent in to a parent by a Yorkshire schoolmaster nearly a hundred years ago:

Mr. Cooper	Dr.	To Wm. Read.	s.	d.
1803				
To son —/A schooling due December 6th	3	0
To Xmas.	0	9
			3	9

The bill was handed over in 1804 together with many other papers, by the family of the deceased Mr. Cooper, to a Hull solicitor for settlement (and apparently remained unpaid). People who are on the watch for evidence bearing on these two points, "a term's fees in lieu of notice" and "a reduction in case of absence during a part of the term," will notice that Mr. Read was accustomed to reckon proportionate charges for such a period as December 6th to Christmas. Terms were unknown quantities in 1803, and fees not always obtainable, as the unreceipted bill goes to prove.

CLASSICS IN IRISH INTERMEDIATE SCHOOLS.

HINTS TO TEACHERS OF MIDDLE AND SENIOR-GRADE CLASSES.

By W. H. D. ROUSE, M.A.

Latin.

WE may treat this subject somewhat more briefly, since the principles will be much the same as in the teaching of Greek.¹ For text-book, the most convenient is Postgate's "Latin Primer," which has the advantage over the "Public School Latin Primer"² that all is correct, and that all doubtful quantities are marked. Neither of these is an ideal book; it is possible, for instance, to rearrange the declensions on a simpler principle; but until the heads of the profession realise this, and agree on a common plan, the change would be practically inconvenient. The book chosen, it will be necessary to divide up both accidence and syntax into as many parts as there are terms to learn it in; and for revision, into blocks, one for each lesson of the term. Here discretion may be used, and attention concentrated on the most important parts. Advanced students will have a difficulty in finding a really good book; neither Kennedy's nor Roby's (smaller) work is just the right thing; but nearest to the ideal is probably "A Latin Grammar" by George M. Lane (Harpers). As before, grammar is best learnt along with translation; and most easily by means of five minutes' simple talk to a lesson. There is no reason why a great deal of the master's talking, even by way of correction or explanation, should not be done in simple Latin. This is the way English is taught in foreign schools, and Latin also, and it is the best way. Catch-questions, bits of out-of-the-way pedantry, testing in unique or rare forms, are for the most part sheer waste of time; and so are papers set on this principle.

TRANSLATION.—As before, we work with a plain text and notebook. Until the Oxford text is available, Teubner's must do; but all editions with small or crabbed type and bad paper should be avoided. Few teachers realise how much damage these things do to young eyes; strained sight is the cause of a great deal of what passes for stupidity, and really is weariness of the muscles. The Oxford texts from this point of view are quite satisfactory. Dictionaries of mythology and antiquities we already have; so it remains only to get a small Smith for the beginners, and a Lewis and Short for the advanced classes. The unseens will be worked in the same way as the Greek. But here the middle grade has an advantage in Walford's "Selections from Cicero" (Clarendon Press), an admirable book, which gives typical specimens of the author covering a wide range.

¹ *THE SCHOOL WORLD*, November, 1901, p. 410.

² "The Tutorial Latin Grammar" (Clive) is also very good.

The whole of this might be read through at some time, and part of it is easy enough to do at an earlier stage. For the chosen speeches to be read whole, we may take one of the denunciatory type, a "Catiline" or a "Philippic" (say the second), and two forensic speeches: "Pro Balbo" (or "Pro Murena") and "Pro Milone" (or the more difficult "Pro Cluentio"). Some of the best pieces of "Verres" are to be found in Walford's book. The parts of Virgil which best repay attention are books II., VI., and one of the last three. One of these, along with a "Georgic," might be taken in two terms, and with the "Eclogues" in the third. If time will not serve to do the whole thoroughly, selections must be made, and the omissions translated rapidly by the teacher or summarised. Occasional unseen pieces might well be given from Ovid. The scansion of the verse must be taught to all pupils; many mistakes are due to confusing words spelt alike but of different quantity. Good editions, which the teacher will want for his own use, are to be had of all the works named above. Macmillan publishes a "Catiline," and Mayor's "Second Philippic" is excellent; while the editions of the others in the series of Macmillan, the Pitt Press, and the Clarendon Press, are generally dependable though varying in merit. But there is no edition I know of which does not give a great deal too much help for the pupil and often a quantity of useless matter besides. Storr's edition of Virgil is excellent, but not enough for the teacher, who will want often to refer to Forbiger (a most valuable storehouse) or Conington.

The *Senior Grade* may take with special care the first, fifth, and twenty-first books of Livy, selecting as before unseens from the rest. There are many school editions of separate books, Seeley's "Book I." is useful for its historical criticism. Horace is so full of difficulties that it is not easy to choose or to know what to omit. Readers are apt to neglect the Epodes, which are often almost impracticable for unseen translation. Specimens of all the lyric metres ought to be chosen for careful work (without forgetting the six great odes of the third book), and the scansion must be understood; the "Ars Poetica" and all the "Satires and Epistles," except those which are objectionable, ought to be done, either with preparation or in a summary manner by the teacher.

As to editions, nothing could be better than Wickham's tasteful edition of the "Odes" (Clarendon Press), and that by T. E. Page in Macmillan's series; for the "Satires," Gow's edition of "Book I." (Pitt Press) may be recommended, and Wilkins's "Epistles" (Macmillan), but the last contains a great deal too much for school work. Orelli's "Horace," with Latin notes, is a standard work which will usefully supplement these.

COMPOSITION.—North and Hillard's "Exercises" (Rivingtons) for the earlier stages, with an excellent book of easy continuous prose by Champneys and Randall (same), may be recommended. For the more advanced, Bradley's "Arnold" is the best, supplemented either by Bradley's more advanced "Latin Prose Composition," or by pieces

from Holden or selected by the teacher. The method followed will be the same as in Greek. Allen's series of Latin prose books is very useful for the intelligent student, but except perhaps the first, they are not altogether suited for class use. There are other series of exercise books, such as Ritchie's or Macmillan's, which have many good points: on the whole, it may be said that the books on Latin prose composition are good. An able work, Abbott's "Via Latina," combines grammar and composition, and if the class has to use only one text-book, this is the best; the same author's "Latin Prose through English Idiom" (Seeley) is well worth using along with any text-book.

We now come to verse, which for our purpose means elegiacs and hexameters. The pupil should begin with a simple, full-verse manual such as "Clivus" (Rivingtons); and as soon as he has ease in manipulating the verse (that is earlier in some cases than in others) he should pass on to easy pieces of English poetry. At this stage it is easier to say what to avoid than what to choose.

All books which give anything like a complete paraphrase, such as Gepp's, are bad: the pupil only looks at the paraphrase and hints, and might as well go on with his full-verse lines. The best plan is for the teacher to choose his own pieces, and give a few hints to the class beforehand if necessary. A good deal of work should now be done *viva voce*, copies being worked out on the board which have not been done by the class; this is the best way to teach intelligence in dealing with the English. The fair copy should always be done in this way, if time allows. And as Latin elegiac lends itself better than any other form of composition to such a method, it is better worth while here for the teacher to make his own copy. It may not be so good as other people's, but it will be more effective, because he will be able to remember and to reproduce not only the final form, but the process. I think that Latin elegiacs so treated, and worked out by judicious questions, arouse more interest than any other kind of composition; and no one who has tried the method suggested will fail to see its educational value.

It might perhaps seem that hexameters ought to come first, as they deal with only one type of line; but, as a fact, a set of hexameters is almost the most difficult kind of Latin composition. A beginner might produce a series of very fair hexameter lines; but the beauty of this verse depends chiefly on the pause, which needs to be varied with skill. With this new element to think of, the pupil had better not begin writing sets of hexameters until he has attained some ease in making single hexameters; and this he gets by the practice of the elegiac, where the effect of the pause is not so much noticed. No satisfactory book on Latin hexameters exists, but the want is likely soon to be met by Mr. S. E. Winbolt, who has given much study to the subject. Meanwhile the teacher must study his Virgil, and choose pieces from one of the standard collections.

The best pupils may try their hands at lyrics,

beginning with the easiest, such as Horace's *Donec gratus eram tibi*, and passing on to alcaics and sapphics. For these again there is no good book, so far as I know; but Wickham's "Horace," and other good editions, give the rules. A fine selection of English verse, which is worth having as an anthology, is Holden's "Foliorum Silvula," Part II. It is wiser for the average boy not to attempt lyrics.

As regards the general question, who should be taught Latin verse, the "full-verse" work is possible for nearly all, and is the best way of learning the metres. After a short while it will be possible to determine who can profitably go on with the study. Learning by heart will be necessary for all in Latin as in Greek.

I have said a few words of Roman history in the introductory paper¹; here I may add the names of a few useful books. Arnold's large "History of Rome" is most interesting to read aloud, especially the early part and the more picturesque descriptions. Two American books, "Rome, its Rise and Fall," by Myers (Ginn), and Botsford's "History of Rome" (Macmillan), both illustrated, are very useful, because (1) they give a general sketch of the whole to the fall of the empire; (2) they give a good deal about social life, literature and the arts, whilst the latter has an excellent bibliography. Emile Thomas's "Roman Life under the Caesars" (English translation published by Fisher Unwin), and "Roman Life in Pliny's Time" (Putnam), although not adequate alone, are each in its way very interesting. Rome is fortunate also in having a series of archaeological books of the highest value, Burn's "Rome and the Campagna," Middleton's "Ancient Rome," and Lanciani's many works—"Ancient Rome in the Light of Recent Discoveries," "Pagan and Christian Rome," "Ruins and Excavations of Ancient Rome," "Destruction of Ancient Rome," "New Tales of Old Rome" (Macmillan). Prof. Lanciani has a unique knowledge of Rome, and no archaeological works are written with more vigour and living interest. Nor should the old translations be forgotten; Plutarch's "Lives" (in North's version) are most valuable to the teacher from more than one point of view.

Amongst other helps may be mentioned a few. Boissier's "Cicero and his Friends" (Methuen), although it deals with the Letters, will be found well worth reading. Collins's volumes dealing with our four authors will also come in useful (Ancient Classics for English Readers); Sellar's "Virgil" is indispensable, and Verrall's "Studies in Horace" suggestive. For the style of Livy, useful books to have at hand are Ballas's "Die Phraseologie des Livius" (Solowicz, Posen, 1885), a collection of phrases with German equivalents, and Riemann's "Etudes sur la langue et la grammaire de Tite-Live" (Thorin, Paris, 1885).

English is rich in standard translations from the Latin, which I recommend for use in the same way as before. Chief among them stands Holland's

"Livy," a noble monument of style, which may often be bought for a few shillings. The old translation of Virgil's "Aeneid" by Phayre is rather quaint than beautiful, but there is more Virgil in it than in Dryden's "Virgil" so-called. Cicero has been done over and over again, but the older translations are almost exclusively taken from the philosophical works. Many of the orations were, however, translated by Duncan and others early in the nineteenth century, and these are worth buying for the few pence which are asked for them. Of translations of Horace the best is by Francis, which is quite common in many editions, and is to be reprinted in the "Unit Library." Bowen's modern translation of Virgil is excellent.

In concluding these few hints, I should like to say that experience will probably modify many of them. Much depends on how the examiners interpret their scheme. It is to be hoped that they will take a wide and liberal view. The scheme on paper is excellent; it rests with Ireland to lead the way in destroying the pernicious system of cram which is fostered by almost all examinations in England. Meanwhile, I should be grateful to those who have the practical work to do if they will write and tell me how my suggestions work, and how they may be amended.

NOTES ON ARITHMETICAL CALCULATIONS.

By JOHN ORCHARD, M.A. (Oxon.).

II.—DIVISION.

WHEN a divisor is of such a form as not to admit of short division in one line, the first or second of the following methods of division should be employed according as the divisor can or cannot be resolved into simple factors.

(i.) When the divisor can be resolved into simple factors, divide by each successively.

Example:— $897643 \div 168$. $168 = 3 \times 7 \times 8$.

$$\begin{array}{r} 3 \overline{) 897643} \\ \underline{7299214} \quad + 1 \\ 8 \overline{) 42744} \quad + 6 \\ \underline{5343} \quad + 0 \end{array} \qquad \begin{array}{l} \text{Answer: } 5343. \\ \text{Remainder: } 19. \end{array}$$

To find the remainder: The division by three has divided the dividend into groups of three with an odd one left over. These groups of three being themselves divided into groups of seven there are 6 groups of three left (= 18), and these, with the odd one for which no place was found in a group of three, give 19 as remainder, since the number of groups of 7 times 3 (or 21) can be divided into an exact number of groups of eight. If there had been a remainder (6, say) this would have represented 6 groups of 21. The process can easily be remembered by analogy with the reduction formulæ. Thus, if the dividend represented inches, and it were divided by twelve, the first quotient

would be groups of 12 inches (or feet) and the first remainder would be inches. Then, dividing further by three, the second quotient would be groups of 3 feet (or yards), and the second remainder would be feet or groups of twelve inches, and so on.

Another example is appended to illustrate the method as applied to compound division.

Example: Divide 6 tons, 14 cwt., 3 qrs., 2 lbs., and 10 ozs. by 165 (= 3 × 5 × 11).

Tons	cwt.	qrs.	lbs.	ozs.	
3 6	14	3	2	10	
5/2	4	3	19	8	and 2 ozs. over.
11/-	8	3	25	4	and 4 groups of 3 ozs. ea. over = 12 ozs.
-	-	-	3	7	7 and 7 groups of 3 × 5 ozs. over
					= 105 ozs.
					Total Remainder = 119 ozs.

Answer: 3 qrs. 7 lbs. 7 ozs. and 7 lbs. 7 ozs. over.

(ii.) When the divisor cannot be resolved into simple factors, long division must generally be employed, but the ordinary method should be shortened by not writing down the product of each digit of the quotient into the divisor (the subtrahends) but by writing down the remainder straight away by the "addition" method of subtraction.

Example: $4673 \overline{)8298763(1775}$

3625,7
354 6,6
27 6 5,3
4 1 8 8 = Remainder.

The divisor will go once into the first four figures of the dividend. Read the process as follows, setting down as remainder at each stage the figures underlined. Multiplying by 1: 1 × 3 = 3 and 5 are 8; 1 × 7 = 7 and 2 are 9; 1 × 6 = 6 and 6 are 12 (carry 1); 1 × 4 + 1 = 5 and 3 are 8. Bring down the next figure, 7, in the usual way, and divide 36257 by the divisor. It will go 7 times. 7 × 3 = 21 and 6 are 27; 7 × 7 = 49 and 2 are 51 and 4 are 55; 7 × 6 = 42 and 5 are 47 and 5 are 52; 7 × 4 = 28 and 5 are 33 and 3 are 36, and so on. An example in compound division is appended.

Example: Divide as much as possible of the sum of 8,008½ guineas equally among 731 persons, a halfpenny being the smallest coin that can be used in the distribution. What portion of this sum cannot be so distributed?

8,008½ guineas = £8,408 18s. 6d.

£	s.	d.	
731)8,408	18	6	(£11 10s. 0½d.
109,8			
367			
20			
7358			
48			
12			
582			
2			
1164			
433			halfpennies over.

Each person gets £11 10s. 0½d., and there is 18/0½ which cannot be distributed.

(iii.) Certain cases of division by numbers of special form call for notice.

(1) To divide by a power of ten move the decimal point as many places to the left as there are noughts in the divisor, e.g., $1 \div 1000 = \cdot 0001$; $80 \div 10,000 = \cdot 008$.

(2) Since $5 = 10^{\frac{1}{2}}$, $25 = 10^{\frac{2}{2}}$, $125 = 10^{\frac{3}{2}}$, to divide by 5, 25, or 125, divide by 10, 100 or 1,000 as shown in (1) and multiply by 2, 4, or 8 as the case may be. If, instead of finding the exact value of the quotient as a decimal fraction, it is desired to find the remainder, the decimal places (taking one, two or three as the case may be) should be divided by 2, 4, or 8.

Example:

$876 \div 25 = 8 \cdot 76 \times 4 = 35 \cdot 04$ or 35 and $\frac{4}{5} = 1$ remainder.
 $9870 \div 125 = 9 \cdot 87 \times 8 = 78 \cdot 96$ or 78 and $\frac{24}{125} = 120$ remainder.

(3) When the divisor is a little short of a power of ten the long division process mentioned above may be shortened as follows. Example: divide 867641 by 996.

Here the divisor = 1000 - 4, so that the remainder at any stage is the same as if the divisor were 1,000, with the addition of 4 times the digit last added to the quotient.

996)867641(871
708,4
11 2,1
1 2 5

Thus, to get the first remainder, 708, it was only necessary to add 32 (= 8 × 4) to 676, and the second remainder 112 = 84 + 7 × 4, and so on.

This may be expressed in a neater form thus:—

867 641
3468
12
4
871 125

$867641 \div 1000$ is 867 and 641 over;
 $\therefore 867641 \div 996$ is 867 and 641 + 4 × 867 over;
 $4 \times 867 = 3468$ and $3468 \div 996 = 3$ and 468 + 3 × 4 over.

The figures to the right of the line are remainders, and, since the sum of these is between 996 and 2 × 996, we add an extra four and get the result immediately by addition, viz., 871 and 125 over.

Another example: $3689765432 \div 9992$.

3689765432
2951808
2360
3692719600

Answer: 369271 and 9600 over.

(4) With divisors which differ by unity from some number, division by which is very simple, a somewhat similar process may be employed; e.g., suppose 799 (= 800 - 1) the divisor. Then division by 799 gives the same result as division by 800, except that the remainder in the division

by 799 exceeds the remainder in the division by 800 by the quotient in the latter case.

Example : $7984321 \div 799$.

$$\begin{array}{r} 800 \overline{)79843 \mid 21} \\ 9980 \overline{)321} \\ 12 \overline{)380} \\ \underline{12} \\ 9992 \overline{)713} \end{array}$$

One form of answer is 9980 and 321 + 9980 over. Now divide 9980 in the same way, and finally carry on the 12 to the remainder and we get the answer 9992 and 713 over. If the sum of the remainders had exceeded 799 the necessary remainder could be obtained by a repetition of the process outlined.

Had the divisor been 801 it would have been necessary to subtract the 12|380 line instead of adding, and further lines in the working would have to be added and subtracted in succession. This process affords an example of the use of a method of subtraction given in the first of these articles.

Examples: (1) $6789431216 \div 6001$

$$\begin{array}{r} 113157 \overline{)1216} \\ 182 \overline{)14843} \\ \overline{)3571} \\ \overline{)18} \\ \hline 113139 \overline{)16077} \end{array}$$

Answer: 113139 and -3923 over; or 113138 and 2078 over

(2) $9123456789476 \div 9001$

$$\begin{array}{r} 1013717421 \overline{)0476} \\ 1887365 \overline{)17579} \\ \overline{)2421} \\ \overline{)4635} \\ \overline{)1881} \\ \overline{)12} \\ \hline 1013604798 \overline{)2678} \end{array}$$

Answer: 1013604798 and 2678 over.

GREATEST COMMON MULTIPLE.

To find the greatest common multiple of a series of numbers, the numbers should, if conveniently possible, be resolved into their prime factors, the G.C.M. being the product of the lowest occurring powers of the prime factors which are common to all the numbers. *E.g.*, Find the G.C.M. of 84, 280, and 784.

The numbers are $2^2 \times 3 \times 7$, $2^3 \times 7 \times 5$, $2^4 \times 7^2$, and the G.C.M. is $2^4 \times 7 = 28$; the prime factors occurring in each number being 2 and 7, and the lowest powers being the square and first power respectively.

In a series of numbers, one of which is easily resolvable into prime factors, the others being less readily manipulated, it will be convenient to adopt a slightly different method, viz., resolve one number only into factors, and proceed to test the divisibility of each of the other numbers by those factors, rejecting any that are obviously unsuitable.

Example: Find the G.C.M. of 17640, 897642 and 764325.

Here $17640 = 2^3 \times 3^2 \times 5 \times 7^2$. The 2^3 may be at once rejected as the third number is odd, and the 5 may also be struck out as the second number does not end in 5 or in 0. Applying the usual test for divisibility by 3 or 3^2 , we see that 3^2 is a common factor; 7 will not go into the second number, it is therefore needless to test whether it is a factor of the third. The G.C.M. is 9.

When neither number can be easily split up into prime factors it will be necessary to apply the usual method of division, successive remainders and divisors becoming divisors and dividends respectively, and the last divisor being the G.C.M. Contracted long division should be used.

Example: Find the G.C.M. of 22,557 and 36,153.

$$\begin{array}{r} 22557 \overline{)36153} \\ 8961 \overline{)13596} \\ 4326 \overline{)4635} \\ \overline{)309} \end{array}$$

309 is the G.C.M., as it goes exactly 14 times into 4326. The successive divisors are on the right and left-hand sides alternately.

When any factor is obviously not a common factor of the two numbers, it is generally useful to reject it at any stage of the calculation.

Example: Find the G.C.M. of 981750 and 7429.

Obviously $250 (= 2 \times 5^3)$ is a factor of the first number, but neither 2 nor 5 is a factor of the second. The G.C.M. is therefore the same as that of the two numbers $3927 (= \frac{981750}{250})$ and 7429.

$$\begin{array}{r} 1309 \overline{)3927429} \\ 204 \overline{)221} \\ \overline{)17} \end{array}$$

17 is the G.C.M. 3 is a factor of the first number and not of the second, therefore reject it.

The factor 4 in 884 can be rejected, as 2 is evidently not a factor of the G.C.M. It is, of course, not worth while to reject the factor 4 from 204, as that divisor differs so little from its dividend 221.

If one of two numbers of which the G.C.M. is sought, is slightly less than a multiple of the other, it is convenient to treat the defect from that multiple, rather than the ordinary remainder, as a divisor in the above process.

Example: Find the G.C.M. of 7281 and 42003.

$$\begin{array}{r} 7281 \overline{)42003} \\ 54c \overline{)1683} \\ \overline{)36} \\ \overline{)9} \end{array}$$

The defect is 1683, and, using this as a divisor, it goes 4 times into 7281, leaving 549 remainder, which goes 3 times in 1683 with 36 over. The factor 4 may be rejected from 36, leaving 9 as G.C.M.

REDUCTION.

In reducing yards to miles, &c., or square yards to acres, &c., it is generally advisable to find the number of miles or acres straight away by division by 1760 or 4840, as the case may be, reducing the

remainder to poles, &c., in the ordinary way. This will save the division of very large numbers by $5\frac{1}{2}$ and $30\frac{1}{4}$ in order to reduce to poles and square poles respectively, the dividends being essentially less than 1,760 and 4,840 in the two cases.

To reduce a sum of money to the decimal of a pound, proceed as follows:—The first decimal place will be half the number of the shillings. Carry on any odd shilling to the pence. To get the remaining places reduce the pence and farthings to farthings, and increase the number of farthings by $\frac{1}{4}$. The resulting number is the number of thousandth parts of a pound contained in the shillings and pence.

Example: Reduce £16 8s. 7½d. to the decimal of a pound.

$$8s. = £.4; 7\frac{1}{2}d. = 30 \text{ farthings} = \frac{£30 + \frac{30}{1000}}{1000} \text{ or } \frac{£31\frac{1}{2}}{1000}$$

Answer: = £16.43125.

Example: Reduce £18 17s. 10½d. to the decimal of a pound.

$$16s. = £.8; 1s. 10\frac{1}{2}d. = 90 \text{ farthings} = \frac{£90 + \frac{90}{1000}}{1000} = \frac{£93\frac{1}{2}}{1000}$$

$$\text{Or } 17s. = £.85; 10\frac{1}{2}d. = 42 \text{ farthings} = \frac{£42 + \frac{42}{1000}}{1000} = \frac{£43\frac{1}{2}}{1000}$$

Answer: = £18.89375.

In the reverse process of expressing a decimal of a pound in pounds, shillings and pence, the first decimal place represents florins; and the remaining places, when expressed as the number of thousandths of a pound and diminished by $\frac{1}{25}$ th, will represent farthings.

Example: Express £18.89675 in pounds, shillings and pence.

$$£.8 = 8 \text{ florins} = 16s.$$

$$\text{Number of thousandths of a } £ = 96.75$$

$$\text{Less } \frac{1}{25} \text{th (see Division iii. [2])} \quad \underline{3.87}$$

$$92.88 \text{ farthings.}$$

$$= 1s. 11d. \text{ and } \frac{22}{100} \text{ of a farthing.}$$

Answer: £8 17s. 11½d.

THE TEACHING OF MODERN LANGUAGES IN FRANCE.

By DE V. PAYEN-PAYNE.

ON November 15th last, M. Georges Leygues, the Minister of Education, addressed a letter to all the *recteurs* of the universities on the subject of the teaching of modern languages. In his letter he states that, in spite of the improvements effected in the teaching of late years, the results attained are not satisfactory. The best pupils can translate, but cannot carry on a correspondence nor keep up a conversation. Teaching that does not effect these two objects stands condemned; for the *practical* knowledge of modern tongues has become a necessity for the man of letters as well as for the man of commerce. He orders, therefore, that modern languages should not for the future be taught like the dead languages as a means of literary culture or intellectual

gymnastics, but that the "direct method" should be employed.

Instead of concerning itself with philology or syntax, this method uses oral exercises, conversation, reading, explanation of authors and texts that give the pupil a wide vocabulary, and teach him a correct and rapid pronunciation. But this reading and explanation of authors must not be transformed into a literature lesson, although the teacher should deal with the moral and intellectual life of the foreign nation. Grammars should be of the simplest kind, not overloaded with exceptions and philological *minutiae*. An oral test should be held in every class at the examinations held at the end of the scholastic year. Pupils should be grouped according to their proficiency, not according to their age or form. English and German should not be the only modern languages taught: Spanish and Italian should have their share in the south-west and south-east respectively. Accompanying this letter is a paper of instructions to modern-language masters which has been drawn up by a committee of the *Conseil Supérieur de l'Instruction publique*.

After stating that the object of teaching modern languages is to give the pupil an effective command of the language, the committee urge the teaching of the ordinary spoken tongue. This should be done by educating first the ear and vocal organs, and the primary duty of the teacher should be to give his pupils a good pronunciation. The spoken word should precede the written, and objects should be connected directly with the foreign word by the help of the objects themselves or of pictures. These oral exercises should follow a regular course, and not be chosen at haphazard. The history, geography, manners and customs of the foreign nation should form the subject of conversations and reading-lessons. The foreign tongue should be used as much as possible during all lessons.

HIGHER TECHNICAL EDUCATION AT HOME AND ABROAD.

IT is not yet effectively realised in this country that to maintain our position as a great industrial nation we must train our industrial leaders as thoroughly as those of the nations whose competition we have to meet. How far this is from being the case at the present time is shown with painful clearness in a pamphlet which has just been issued by the Council of the Association of Technical Institutions.

The Association asked some hundred institutions throughout the United Kingdom to supply information as to the number of day students of fifteen years of age or more who are taking complete regular day technological courses of not less than twenty hours a week, and it is upon these statistics that the conclusions of the pamphlet are based. Fifteen years was chosen as the age of

entry, because experience has shown that it is the lowest limit of age at which any technological instruction should be given, but in making comparisons with other countries it must be remembered that in Germany and the United States the minimum age of entry to technical high schools is eighteen years.

The Council of the Association of Technical Institutions very wisely disregard the students of evening technical classes for the purpose of the comparison, since, as is pointed out in the pamphlet, the scope of evening work is of necessity of a very limited nature. The statistics collected and summarised by the Council show that the number of students receiving higher technical education in the United Kingdom is appallingly small. Of first-year students there are 2,080; of second-year students, 1,125; third-year, 555; and of students who have attended more than three full years, 113, making a total of 3,873 students above fifteen years of age who are taking complete day technological courses of twenty or more hours, a week. By far the largest numbers studying any one branch of technology are the engineering students, so that by selecting this subject for comparison the Council run no risk of being charged with making matters look worse than they really are. In engineering, the total number of third-year students is only 347, and of fourth-year students 52, and these numbers are only obtained by counting students who begin their studies at fifteen. In the session of 1900, there were in the Charlottenburg Technical High School, Berlin, 245 third-year and 242 fourth-year students studying engineering, and all of them over eighteen years of age. The total number of students at Charlottenburg is more than two-thirds as many as the total number for the whole of the United Kingdom. Or again, the number of students taking complete day courses in nine of the technical high schools of Germany for the winter term of 1889-1900 was 10,896, and there were 2,536 occasional students, making a total of 13,432, exclusive of students in special agricultural, veterinary, mining and forestry schools. Compare these numbers with the 3,873 for the whole of the United Kingdom, and remember the ages of entry—eighteen years at the German, and fifteen at the British institutions. And much the same is true of America. At the Massachusetts Institute of Technology, Boston, the number of enrolled students is more than 1,100, and the average age of entrance is eighteen and a half years.

Nor are these the only respects in which we compare so unfavourably with our competitors. In the matter of preliminary training, our students are far behind those who enter the technical high schools abroad. Ninety-three per cent. of the students who entered the Charlottenburg Technical School in a recent session had satisfactorily completed a nine-years' course in a secondary school. As the pamphlet says, "In this country there is either no examination for admission to technical institutions, or it is of a very simple character."

We not only lack students, but in the matter

of buildings, equipment, and the provision teachers we are still far behind Germany, Switzerland, and America. To take one example, the number of students for each professor or assistant-professor is at Charlottenburg about 32; at Boston, about 21; at the London Central Technical College, about 58.

The Council concludes its pamphlet with a few suggestions as to how our deficiencies may be remedied. Parents must be brought to see the necessity for continuing the technical education of their children to a later age than at present. Employers must be persuaded to insist upon the possession of advanced technical training and knowledge as a condition of employment in responsible positions. The Government must organise secondary education. More money must be provided from national and local sources. But when will these things be, and what will be the sign of their coming?

THE GREAT PERSIAN WAR.¹

MR. GRUNDY comes to his task with a first-hand knowledge of Greek topography, which, as far at least as the battlefields are concerned, is probably unique. He has studied the campaigns on the spot, and has himself surveyed most of the ground. In this volume the results are published in excellent maps, which must for the present be regarded as the standard maps; for Greece has never been properly surveyed as a whole, many of the features laid down in ordinary atlases are rough-and-ready guesswork, and the science of map-drawing has greatly advanced of late years. When a complete survey of the land has been made and detailed contour-maps are available for the whole, Mr. Grundy's will be superseded by better; until then they must hold the field. He makes it still easier to follow the story by the addition of a number of plates; some photographs from nature, others from the excellent sketches of E. Lear, in which a simple system of cross-numbering shows exactly the points indicated as important.

In many respects Mr. Grundy's work is original. He sets forth for the first time, in all its importance, the fact that the Persian empire of the fifth century was not an effete Oriental barbarism, but a strong system, highly organised, and guided by men of strong will and intellect, and of wide experience both in statecraft and in war. The personality of Darius condenses from the shadowy genie of the Arabian Nights into a compact and powerful human figure, wise and magnanimous, capable of conceiving vast plans and of carrying them out. His Scythian expedition, instead of a meaningless raid, appears to be aimed at substi-

¹ "The Great Persian War and its Preliminaries: a study of the Evidence Literary and Topographical." By G. B. Grundy, M.A., Lecturer at Brasenose College, and University Lecturer in Classical Geography. 591 pp. With illustrations. (Murray.) 21s. net.

tuting an "ethnic frontier" for an artificial one, and thus anticipates the most modern lessons of political science. It is true Mr. Grundy does not succeed in clearing up all the details of the story, but he has made a good beginning. The "legend of Themistocles" is cleared of many lies which the prejudices of a later age added to it; and the high estimate which Thucydides gives of him is borne out by Mr. Grundy's analysis of his strategic plans. Marathon, though still a riddle, becomes clearer than before. The strategy of Thermopylæ is elucidated; and the death of Leonidas and the Thespians made to appear, not the last stand of blind courage, but the choice of a great man to risk all for a worthy end. Probably Simonides has had more to do than all others with the interpretation usually given to the sacrifice at Thermopylæ, and no doubt he believed what he said; but the glory of Leonidas himself is much enhanced by seeming intelligence behind his great deed. The operations at Salamis now appear reasonable; Herodotus is shown to have erred not in his description so much as in his dates, whilst the evidence of Æschylus is given its due weight. The terrible risks of that day are clearly set before us: how the position was for Greece the last refuge of despair; how Xerxes had the game in his own hands if he had merely left them alone and sailed on to the Isthmus; how Themistocles alone saw the real issue and to his skill alone the victory was due. The tortuous operations about Plataea are also set in a clearer light, by careful analysis, and by the identification of the island. Final chapters discuss the war as a whole, and pay a well-deserved tribute to the shrewdness and honesty of Herodotus.

We have not space to discuss the whole book in detail. Many points there are in it which Mr. Grundy would freely admit to be doubtful; identification of sites, suggestions of motive, tactical evolutions. But, as a whole, we have only high praise for the book. It is at least the most complete examination we know of the evidence heretofore known, and it includes much of importance which is new. It will therefore be indispensable to the serious student.

Scott's Marmion. Edited by A. Mackie. 276 pp. English Classics. (Blackwood). 1s. 6d.—This is a careful edition of a poem which has been less in evidence of late years than was the custom three or four decades ago. Then one heard "Marmion" and learned "Marmion," and perhaps got tired of "Marmion." At any rate, "Marmion" as a poem, even for school purposes, dropped into a minor position when it was found that out of the larger treasury of English poetry things new and old might be brought, some of which were of more sterling worth. Yet "Marmion" has characteristics which entitle it to respectful attention, and so long as Scott retains his hold on young people, editions like the present may expect wide recognition. Mr. Mackie does not make any claim for his author to be regarded as a British Homer, but in his introduction he gives a very carefully considered account of Scott's place in poetry, and of his main characteristics, and two plans of the Battle of Flodden, which he incorporates, are distinctly serviceable. The notes are accurate and interesting, and help to make a most useful volume.

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THE TRAINING OF SECONDARY-SCHOOL TEACHERS.¹

RETROSPECTION, in the consideration of important subjects, is generally helpful; since, moreover, it may provide the data necessary to the formation of an estimate as to the progress effected in present knowledge and opinion, it may prove of assistance in indicating the most hopeful direction for future endeavour. Whatever may be the truth of the generalisation as a whole, there can be no doubt of its applicability to the particular discussion, so much in evidence in recent years, the desirability of professional training for secondary schoolmasters and schoolmistresses. No more suitable guide, in the attempt to evaluate the success of the efforts made by far-sighted educationists to convince the authorities for education and teachers themselves of the value of instruction in the philosophy of education for young men and women who intend to take charge of forms in secondary schools, could be desired than Prof. Laurie, who has, since 1876, been Professor of the History of Education at Edinburgh University. The volume before us contains a number of selected papers on educational topics written by the author at different times during the last twenty years, and chief among the questions debated is this matter of professional training for teachers.

As the reader proceeds from one essay to another a feeling, bordering on oppression, grows that we are even now little in advance of the state of public opinion twenty years ago concerning what may be expected from the secondary schoolmaster in the way of preliminary equipment. Everybody admits that the teachers of elementary schools are benefited by the lectures and criticism of the training college, but it is still seriously maintained that, for the work of grammar and high schools, teachers are "born" and it is useless to attempt to "make" them. Addressing the Teachers' Guild in 1890, Prof. Laurie said: "It was only the other day—I hope we may regard the day as past—that secondary schoolmasters looked with suspicion, even contempt, on the study of methods, and regarded every man who talked of methods as a 'mere theorsit.'" But eleven more years have passed, and, unless the present writer has had an altogether exceptional experience, the day of this distrust is still far from past.

A little later in the same address the teachers present were told why the great body of secondary schoolmasters were unconvinced of the need for training. The words themselves will bear repetition:

It is because they have not yet risen to the level of their work; they have not yet discovered their true function in the community. They insist, in accordance with a bad tradition, on regarding themselves simply as teachers of this or that subject. . . . For this a totally different idea of their function has to be substituted and firmly grasped; and that idea is that they are not teachers of subjects primarily at all, but teachers of

¹ "The Training of Teachers and Methods of Instruction." By S. S. Laurie, A.M., LL.D. iv. + 295 pp. (Cambridge University Press.) 6s.

minds by means of subjects. When they fully realise that they teach minds, they will at once see that they are bound to study mind.

The sceptics among secondary schoolmasters who really desire the welfare of education should study the arguments of Prof. Laurie, which are expressed not only with masterly clearness, but with conspicuous fairness. He admits that the educational genius with an intuitive grasp of psychological principles and the essentials of methodology does occasionally arise and keep school with consummate ability—and all without lectures or criticism lessons. But the number of schools in Britain is so great that thousands (some say fifty) of teachers are required, and it is absurd to count on the appearance of such a number of geniuses. Besides, while quite ordinary persons can be made into very useful teachers by suitable training, the genius will come to no harm from the same treatment.

Prof. Laurie does not confine his attention to the making of schoolmasters. The methods of teaching geography and history are passed in review, the legitimate place of examinations and competition in school work is pointed out, and, to name only one other subject, some of the dangers in the disciplinary devices of good schoolmasters are indicated. This last lecture alone, which was delivered at an educational congress at Edinburgh in 1882, would justify a recommendation of the volume to the earnest attention of acting teachers. It is practical, breathes of a wide experience, and, what is more, is capable of an immediate translation into class-room practice.

A CONTRIBUTION TO A CONTROVERSY.

RATHER more than a year ago, when a correspondence on Modern-language Teaching was proceeding in the columns of *The Times*, Dr. Almond, the headmaster of Loretto, called for more facts. This challenge has been taken up by Mr. J. J. Coulton,¹ who deals very effectively with three points, where he believes, and rightly believes, that our educational system is in need of reform: (1) Modern-language Teaching and Examinations; (2) Army Examinations; (3) English Teaching.

In dealing with the first point, Mr. Coulton hardly brings forward any evidence which is not already familiar to close observers. He marshals his facts well, and contrasts the position of modern-language teaching and teachers in this country and on the continent. Mr. Coulton points out that our modern-language masters are placed at a disadvantage as compared with their classical *confrères* both as regards pecuniary position and prospects and chances of promotion. That such is in the main the state of the case is, we regret to say, only too true, but prejudice on the modern-language question is rapidly being overcome, and

inequalities are bound to right themselves. Efficient modern-language teaching will not, we are convinced, be allowed to go unrewarded, when the public has once made up its mind in this country—as it has elsewhere—that in the schools of the future the teaching of modern languages shall be at least as efficient as is the teaching of the classics in our great classical schools. Mr. Coulton's criticisms are destructive rather than constructive with regard to the teaching of modern languages; he does not advocate the new method, nor do we believe that its introduction is as yet possible in view of the insufficient supply of teachers. We are fully in sympathy with his condemnation of formal-grammar teaching, though here again the teacher is at the mercy of the examiners and their masters. If only in *all* modern-language examinations a *modicum* of translation into the foreign language were insisted upon as a condition of passing, formal-grammar teaching would soon disappear; it would no longer pay teachers to cram their pupils with set books and formal grammar if examining bodies demanded something higher than set book, *plus* grammar and a little unseen, as a condition of a pass. Mr. Coulton has indeed many hard things to say about examiners—French examiners more particularly—and no one will deny that cause for complaint with regard to the style of paper often exists, but in no examination in this country with which we are acquainted is the examiner given a free hand: he makes his paper according to instruction, and naturally he does not feel inclined to provoke storms of criticism by departing too much from time-honoured models. Yet even here some advance may be detected by comparing papers set, say, fifteen years ago and those set to-day.

Before leaving this part of Mr. Coulton's work we are bound to point out one error which excessive zeal has led him to commit. On p. 64 he tells us how "a German classical schoolboy of 12½ knows more (French) grammar, though perhaps less vocabulary, than a prospective English officer who has got very fair marks in French for Sandhurst," and refers us for further information to Appendix A; there we learn that the piece of composition for Sandhurst was given to boys of the *Untersecunda* at Göttingen whose average age was 12½; if Mr. Coulton will refer to any German *lehrplan* he will see the slip he has made, and may in a second edition translate *untersecunda* by *lower fifth*, average age about 15½. It is from this special form that boys in German take the *Abschlussprüfung*, and pass into the army in Germany to serve as volunteers; so that this particular example of our shortcomings is singularly ill-chosen.

In dealing with the question of Army examinations, Mr. Coulton points out how the whole examination is vitiated by the introduction of compulsory Latin, and how everyone is agreed that the present system tends to bad work in every subject, except perhaps in mathematics, and that the army class is bound to overtax the

¹ "Public Schools and Public Needs." By G. G. Coulton. (Simpkin Marshall.)

powers of its members by demanding too many hours' work *per diem*. As a remedy Mr. Coulton makes some very sound suggestions, the vital one being the dropping of the compulsory Latin. Mr. Coulton concludes his interesting book with a chapter on the teaching of English—a subject which from time to time rouses the Headmasters' Conference to spasmodic efforts. We heartily commend the volume under notice to all those who are interested in educational reform.

AMERICAN EDUCATIONAL JOURNALS.

THE late R. H. Quick once wrote: "If a book were published showing how teachers could add five per cent. to their incomes, the whole profession would read it as one man, but if a book only shows the teacher how he may work with more interest and pleasure to himself and more profit to his pupils, nobody cares to look at it." Fortunately for British education, an increasing body of teachers is alive to the value of the study of the science and art of education. Abundant evidence of this improvement is provided by the large number of volumes on various branches of pedagogics published in this country during recent years. But, while the schoolmaster who studies current literature dealing with educational topics is with us exceptional, the enthusiastic student of the literature of education is the rule among American teachers. That this is so may be seen from the fact that American schoolmasters and schoolmistresses support two hundred and fifty educational periodicals. What fraction of this total, we wonder, would fairly represent the number of similar magazines with a fair circulation among our teachers? We will not venture upon an approximation lest it appear uncomplimentary and unpatriotic.

Until recently these American educational journals have not been easily accessible to English readers, but the American School and College Text-book Agency, 9, Arundel Street, Strand, London, W.C., has now made arrangements for supplying subscribers in this country with any paper published in the United States. Though we cannot pretend to deal with all such periodicals, it is proposed here to direct attention to a few typical examples, so that some idea of their variety and excellence may be formed. For convenience these publications may be divided into four classes, viz.: (i.) Those concerned chiefly with secondary and higher education; (ii.) Those dealing with primary education; (iii.) Kindergarten papers; (iv.) Journals devoted to special subjects of instruction.

As typical of the first class the following journals, copies of which are before us, may be mentioned in the order of our estimate of their relative value to secondary-school teachers on this side of the water:—

Educational Review. Edited by Nicholas M. Butler, Professor of Philosophy and Education in the University. Monthly. Annual Subscription, 14s. 6d.

School Review. Edited by the Department of Education of the University of Chicago.

Education. Edited by Dr. Richard G. Boone. Annual Subscription, 14s. 6d.

Pedagogical Seminary. Edited by Dr. G. Stanley Hall, Professor of Psychology and Education in Clark University. Quarterly. Annual Subscription, 22s. 6d.

Journal of Pedagogy. Edited by A. Leonard (Ypsilanti, Mich.). Quarterly. Annual Subscription, 7s. 6d.

Teachers' College Record. Published under the auspices of Columbia University. Bi-monthly, except July. 5s. 6d. per annum.

The periodicals dealing with primary education differ most from similar publications in this country in the absence of any mention of the politics of education. They are concerned only with the teacher's work, and there is little prominence given to those questions of security of tenure, pension funds and so on, which take up so much space in our weekly educational newspapers. It must be remembered these remarks apply to the papers named and are not generalisations based upon an examination of all American elementary-school papers.

Elementary School Teacher. Edited by Francis W. Parker, Director of the University of Chicago School of Education. Monthly. 8s. 6d. per annum.

Teacher's World. A Journal of Methods, Aids and Devices. Monthly. 5s. 6d. per annum.

Primary Education. Monthly. 5s. 6d. per annum.

The Kindergarten journals are fairly represented by the *Kindergarten Magazine*, which is the official publication of the national Kindergarten movement. It is published monthly in Chicago, and costs 10s. per annum.

The fourth class is a numerous one, and we have from time to time directed attention to important articles in different papers belonging to it. Where the subjects are so unlike it is impossible to place the papers in order of merit. Specialists in different subjects are particularly catered for by these periodicals, an examination of which shows us they are all brightly written by practical teachers:

Bulletin of the American Bureau of Geography. Edited by E. M. Lehnerto. Quarterly. 8s. 6d. per annum.

Journal of School Geography. Edited by Professor R. E. Dodge. Monthly. 4s. 6d. per annum.

Manual Training Magazine. Published under the auspices of the University of Chicago. An illustrated magazine devoted to the interests of Manual Training, Sloyd, Drawing, Domestic Arts, &c. Quarterly. 5s. 3d. per annum.

School Science. A Journal of Science Teaching in Secondary Schools. Edited by C. E. Linebarger. Monthly. 10s. 6d. per annum.

Birds and Nature. Beautifully illustrated by Colour Photography. Monthly. 7s. 6d. per annum.

Educational Gazette. A Journal of Advanced Thought and Method. Monthly. 5s. 6d. per annum.

It only remains to be said, that with one or two exceptions, the magazines are not published in July and August, and as a rule the new volumes commence in September. The American Agency is prepared to lend, for a day or two, copies of any of the papers named above to teachers who think of becoming subscribers—on condition of the journals being promptly returned and the postage paid.

THE RELATIVE ADVANTAGES OF DIFFERENT SYSTEMS OF MODERN-LANGUAGE TEACHING.¹

I KNOW not whether the Conference will think this a good subject for discussion: it certainly well deserves consideration, but I wish it could have been introduced by one who was more intimately familiar with the details of a large and complex question.

After years of discussion abroad it has begun to be seriously discussed in England, partly no doubt because it is considered to have some bearing on the growing competition between British and foreign industry and commerce. Symptoms of rising interest are visible in the Oxford proposal which was brought before us yesterday, and also in a motion to be brought forward at the Conference of the Incorporated Association of Headmasters next month.

It may be convenient to lay down a framework for our discussion by a short statement of five principal methods of modern-language teaching which are recognised by experts: they are the most definite and prominent among the many now in the field.

(1) A venerable relic of the old classical system of teaching still survives in what is called the grammar method, by which a pupil is put through a manual of grammar as a preliminary. The reading-book is regarded mainly as a magazine of illustrations of grammatical facts and principles; the foreign language is little regarded as a means of speech, or as a source of literary culture; the amount of reading is small, and on a low intellectual level, because so much time has been devoted to grammar. "Every year I am more convinced," said Mr. Bowen in a paper read at the Eton Conference in 1879, "of the uselessness of formal grammar as a means of teaching": not that the grammar manual is useless; "let it be used, thumbed, ransacked; to teach its use is a great part of the master's work; but not in the form of lessons to be learned."

Grammar rightly used is an excellent discipline of the reasoning and logical faculties; but it should enter into the teaching course in a different proportion and order than in the grammar method.

This method is convenient for teachers who have only a book knowledge of more or less elementary French, and in such hands it may be made deadly dull, and effectually quench the desire to know more of a repulsive subject.

How far it still prevails in English schools no one can say: it ought to be extirpated; but that will not be until there is a much fuller supply of qualified teachers.

(2) Exaggerated reaction from its defects has produced the "natural" or "conversational" method, much in vogue in German commercial cities such as Hamburg and Frankfort, because of its value for business purposes. It has its ardent supporters in this country, and attracts many as being a short cut to fluent ungrammatical talk, with too little regard to the fact that talk, if it is to rise above a purely utilitarian level, is valuable in proportion to the knowledge, thought, and mental faculty of which it is the outcome. The conversational method often consumes too much time and energy in constructing and perfecting the machinery of talk.

The central idea is that a boy should learn the foreign language as an infant learns to speak; with this difference, that from the beginning the mother tongue is tabooed, and all teaching and answering is in the foreign language.

This method has the great advantage that in the hands of an able teacher it is extremely interesting, and gives to the learners

a sense of rapid progress and mastery; but it has the fatal defect of providing little discipline or pabulum for the intelligence, and it does not rise above a low intellectual standard. Dr. Russell, in his valuable book on German Higher Schools, says: "It is characteristic of this school that it prefers in its highest English classes Mrs. Ewing's 'Jackanapes,' 'Tom Brown's School Days,' and Irving's 'Sketch Book,' to Shakespeare, Macaulay, or Emerson"; and that the highest French class of one of the most distinguished teachers was reading "Le Tour de la France par deux enfants."

Nevertheless, while it would be disastrous if more disciplinary methods of language teaching should be supplanted, this method has elements which both in earlier and later stages of education might be used with advantage to add interest, variety, and vitality to lessons based on sounder methods.

(3) The psychological or Gouin method, based on the principle of association of ideas and the practice of visualisation.

This method also is attractive; it excites interest and attention, gives command of vocabulary, and facility in talk; but it resembles the "natural" method in its lack of discipline and training for the judgment and higher faculties. There is moreover difficulty in using it profitably in large classes. As a recent critic says, "son application n'est pas toujours compatible avec la discipline scolaire."

(4) The three methods thus briefly sketched pay far less attention to pronunciation of the foreign language than the phonetic or "reform" method, which begins with oral instruction in sounds expressed on blackboards, and printed texts in phonetic notation, together with careful drilling in the use of the vocal organs.

The promoters of this method have also made profitable use of object-lessons, pictures, maps, diagrams, &c., in order to familiarise pupils with the mode of life, the social and political institutions, habits and character of the people whose language is being taught.

This method has valuable elements specially suited to the more elementary stages, at a time when the organs of speech are most plastic, and the curiosity and imagination of the child welcome a variety of object-lessons.

But unless a very liberal share of time can be allotted to modern-language teaching, the phonetic system must be used sparingly, otherwise it will eliminate some of the more solid factors of linguistic education. In fact, the last three methods which I have mentioned agree in setting too high a value on conversational facility and fluency.

Of course, the power to speak a foreign language has a very solid value in certain branches of industry and commerce. I hear of business men who would gladly employ public-school boys, but reluctantly refuse them because a moderate equipment of French or German speech is lacking. In the Army, the Navy, and some departments of the Civil Services, the power to talk a foreign language ought to be far more common than it is. And in any career a man finds some advantage in this accomplishment. But people who have it not are disposed to overrate the advantage of it. In ordinary life, or even in foreign travel, how few opportunities there are for talk more intellectual than what is needed for intercourse with railway officials, or the few waiters who have not learned English!

All the same, there is sufficient reason for a limited and moderate use of the conversational method even on the classical sides of our schools, provided that at home, or in the preparatory-school stage, instruction has been given in pronunciation and simple speech. Every master appointed to teach French or German should have a reasonable power of speaking it, and he may now find ready to hand text-books excellently equipped with vocabularies, phrases, sentences, and other helps for oral retranslation from the text-book. But without early preparation

¹ Paper read at the Headmasters' Conference at Cambridge in December, 1901, by the Rev. G. C. Bell, M.A., Headmaster of Marlborough College.

it is futile to attempt to teach fluent conversation in French or German to the middle or upper forms of public schools. The mere attempt to remedy ingrained defects of Anglicised pronunciation in a class of twenty or twenty-five boys must consume an amount of time and energy which is not justified by the results.

(5) I now come to the fifth and last of the methods to be considered. The reading or translation method prevails largely in forms of secondary schools taught by a British master, with no more than an average familiarity with the spoken language, scorning phonetics and object-lessons, and disposed through his classical training to insist on grammatical accuracy. The characteristic features of this method are the use of text-books from the beginning, and much practice in translation with the aim of rendering the foreign language into English. Pronunciation is not much regarded, and there is little oral practice.

Good teaching on these lines may help to form style, and discipline the judgment and other faculties by solution of the many problems involved in scholarly translation; it may impart readiness in the use of French and German books, and in some cases an abiding appreciation and enjoyment of French and German literature. But this comparatively easy way of teaching lacks vivacity and stimulus, and may also prove demoralising to the teacher, by making little call upon his powers. Moreover, no amount of mere reading can give a handy and living knowledge of a foreign language. The reading method, whatever be its advantages for higher forms, should come in as the sequel or climax of teaching which in earlier stages has been enlivened by a judicious blending of elements borrowed from the newer methods.

From the review of these five methods it is apparent that, whereas no one of them is free from characteristic defects, each one has advantages of such a kind that, during the school course of a boy or girl between nine and nineteen, elements of each one might be utilised.

I will spare you the attempt to construct an ideal scheme: in fact, having regard to the great variety of secondary schools, and the requirements of different departments in each school, it is obvious that no single method or combination of methods could be applicable everywhere.

There is only one definite suggestion that I would offer: it is that the masters of preparatory schools should take the first step of a necessary reform by training their young boys in pronunciation, and accustom them to the sound and the use of the spoken language. Doubtless they would be much encouraged to attempt this if the entrance examination of public schools included a *viva-voce* test of French or German.

I will conclude by presenting one or two further points for your consideration.

The teaching of modern languages being in an imperfect and chaotic state, there is urgent need of a consensus of expert opinion on such questions as these:—

What should be our aim or aims in teaching modern languages in classical forms, modern forms, Army classes, science schools, &c., &c.?

What system or combination of systems would be best suited for the several aims of these schools and departments?

What proportion of time should be allotted respectively to classical and modern languages at different stages of education and in different curricula?

And, above all, how is it possible to satisfy the first and most essential condition of improvement, viz., a vast increase in the number of English-speaking men and women adequately trained to teach modern languages?

You will agree that no system can be considered permanently satisfactory which relies largely on the help of foreigners. In Germany it is almost an invariable rule that the school teachers of modern languages are Germans. In English schools they

should be English. No doubt in the present state of the teaching profession we must for some years to come thankfully avail ourselves of the help of the many able and accomplished foreign teachers of modern languages. But we must regard this as a temporary expedient until the day when a reforming movement shall have provided our secondary schools with native-born teachers fully qualified for their work.

How to train and qualify them is a question of great difficulty and importance, and there is some fitness in urging it upon you here, because the University of Cambridge has honourably distinguished itself by its early and persistent efforts to train teachers.

Such questions as I have now put before you have long ago been discussed and settled in several Continental countries by central authorities appointed by Government. Ought we in England in this particular matter to look for help and guidance from a central authority?

It would be ungrateful not to acknowledge the stimulus that has been given to reform by the admirable reports issued by the Intelligence Department of the Board of Education. But to publish information is not enough: we need leadership to turn it to the best account for English schools. And if after years of abortive expectation we should think it full time to act, it is open to us to do what has been done in America. There such questions as I have mentioned are in process of solution by the Anglo-Saxon method of voluntary action independent of Government control.

In 1896 the Modern-Language Association of America appointed a Committee of twelve to "consider the position of modern languages in secondary education; to examine into and make recommendations upon methods of instruction, training of teachers," and other kindred subjects. Their procedure, their conclusions and recommendations, are set forth in their short and handy report presented in 1898. I have borrowed largely from it.

Would it not be possible to organise in England a similar body for similar purposes by the co-operation of Universities with various associations of secondary-school teachers? Such a body or committee would have at its disposal a mass of information about methods and results on the Continent of Europe and in America which would help it to solve the diverse problems of modern-language teaching in this country.

It is for this Conference to say whether it considers this proposal likely to be feasible and fruitful. If there should appear to be a consensus of opinion in its favour, an effort to carry it into effect may be initiated on the spot by an instruction to the Committee to consider and report upon it.

SCOPE AND METHOD OF MATHEMATICAL TEACHING IN SCHOOLS.

It will be remembered that at the Glasgow meeting of the British Association, held last September, an important discussion took place on the teaching of mathematics, Sir John Gorst being in the chair. Prof. Perry opened the proceedings with an address which was printed in full in our October and November numbers, and after he had concluded, the subject was discussed from many points of view, the speakers including some of the foremost representatives of pure and applied mathematics. The address and the discussion have now been published in a volume edited by Prof. Perry. To the remarks made at the meeting others since received have been added, and a reply is appended to the chief criticisms of the reforms advocated. Prof. Perry's reply concludes with the statement of a series of principles upon

which there seems to be general agreement, and we propose to deal with these from the point of view of the practical teacher in our next number, which will contain several articles on mathematical subjects.

As the result of the discussion a committee was appointed by the Association "To report upon improvements that might be effected in the teaching of mathematics, in the first instance in the teaching of elementary mathematics, and upon such means as they think likely to effect such improvements." The committee consists of Prof. A. R. Forsyth (Chairman), Prof. J. Perry (Secretary), Principal A. W. Rücker, Principal O. J. Lodge, Major P. Macmahon, Dr. J. Larmor, Professors W. H. H. Hudson, S. P. Thompson, G. Chrystal, O. Henrici, A. Lodge, A. G. Greenhill, G. W. Minchin, G. A. Gibson, R. Russell, R. A. Gregory, Mr. W. D. Eggar, Mr. H. W. Eve, and Dr. Gladstone.

There is no doubt that this committee will exert an influence upon mathematical teaching in schools, as the views adopted by it will be accepted by public examining bodies as authoritative. The subjoined open letter, signed by a number of mathematical masters in public schools, has been sent to the committee, and similar expressions of opinion may be expected. The letter is a sign that many masters in public schools are in favour of the revision of the present scheme of mathematical teaching, and it will strengthen the hands of the committee very considerably. As the representatives of the traditional sequence of subject matter in school mathematics have not taken up the defence of the existing machinery, it must be assumed that they are either indifferent or cannot give substantial reasons against the proposed changes.

The letter already referred to is as follows :—

GENTLEMEN,—At the invitation of one of your own body, we venture to address to you some remarks on the problems with which you are dealing, from the point of view of teachers in public schools.

As regards geometry, we are of opinion that the most practical direction for reform is towards a wide extension of accurate drawing and measuring in the geometry lesson. This work is found to be easy and to interest boys; while many teachers believe that it leads to a logical habit of mind more gently and naturally than does the sudden introduction of a rigid deductive system.

It is clear that room must be found for this work by some unloading elsewhere. It may be felt convenient to retain Euclid; but perhaps the amount to be memorised might be curtailed by omitting all propositions except such as may serve for landmarks. We can well dispense with many propositions in the first book. The second book, or whatever part of it we may think essential, should be postponed until it is needed for III., 35. The third book is easy and interesting; but Euclid proves several propositions whose truth is obvious to all but the most stupid and the most intellectual. These propositions should be passed over. The fourth book is a collection of pleasant problems for geometrical drawing; and, in many cases, the proofs are tedious and un instructive. No one teaches Book V. A serious question to be settled is—how are we to introduce proportion? Euclid's treatment is perhaps perfect. But it is clear that a simple arithmetical or algebraical explanation covers everything but the case of incommensurables. Now this case of incommensurables, though in truth the general case, is tacitly passed over in every other field of elementary work. Much of the theory of similar figures is clear to intuition. The subject provides a multitude of easy exercises in arithmetic and geometrical drawing; we run the risk of making it difficult of access by guarding the approaches with this formidable theory of proportion. We wish to suggest that Euclid's theory of proportion is properly part of higher mathematics, and that it shall not in future form part of a course of elementary geometry. To sum up our position with regard to the teaching of geometry, we are of opinion :

(1) That the subject should be made arithmetical and practical by the constant use of instruments for drawing and measuring.

(2) That a substantial course of such experimental work should precede any attack upon Euclid's text.

(3) That a considerable number of Euclid's propositions should be omitted; and in particular

(4) That the second book ought to be treated lightly, and postponed till III., 35, is reached.

(5) That Euclid's treatment of proportion is unsuitable for elementary work.

Arithmetic might well be simplified by the abolition of a good many rules which are given in text books. Elaborate exercises in vulgar fractions are dull and of doubtful utility: the same amount of time given to the use of decimals would be better spent. The contracted methods of multiplying and dividing with decimals are probably taught in most schools; when these rules are understood, there is little left to do but to apply them. Four-figure logarithms should be explained and used as soon as possible; a surprising amount of practice is needed before the pupil uses tables with confidence.

It is generally admitted that we have a duty to perform towards the metric system; this is best discharged by providing all boys with a centimetre scale, and giving them exercise in verifying geometrical propositions by measurement. Perhaps we may look forward to a time when an elementary mathematical course will include at least a term's work of such easy experiments in weighing and measuring as are now carried on in many schools under the name of physics.

Probably it is right to teach square root as an arithmetical rule. It is unsatisfactory to deal with surds unless they can be evaluated, and the process of working out a square root to five places provides a telling introduction to a discourse on incommensurables; furthermore, it is very convenient to be able to assume a knowledge of square root in teaching graphs. The same rule is needed in dealing with mean proportionals in geometry.

Cube root is harder and should be postponed until it can be studied as a particular case of Horner's method of solving equations approximately.

Passing to algebra, we find that a teacher's chief difficulty is the tendency of his pupils to use their symbols in a mechanical and unintelligent way. A boy may be able to solve equations with great readiness without having even a remote idea of the connection between the number he obtains and the equation he started from. And throughout his work he is inclined to regard algebra as a very arbitrary affair, involving the application of a number of fanciful rules to the letters of the alphabet.

If this diagnosis is accepted, we shall be led naturally to certain conclusions. It will follow that elementary work in algebra should be made to a great extent arithmetical. The pupil should be brought back continually to numerical illustrations of his work. The evaluations of complicated expressions in a , b and c may of course become wearisome; a better way of giving this very necessary practice is by the tracing of easy graphs. Such an exercise as plotting the graph $y = 2x - \frac{x^2}{4}$ provides a series of useful arithmetical examples, which have the advantage of being connected together in an interesting way. Subsequently, curve-tracing gives a valuable interpretation of the solutions of equations. Experience shows that this work is found to be easy and attractive.

With the desire of concentrating the attention of the pupil on the meaning rather than the form of his algebraical work, we shall be led to postpone certain branches of the subject to a somewhat later stage than is usual at present. Long division, the rule for H.C.F., literal equations, and the like, will be studied at a period when the meaning of algebra has been sufficiently inculcated by arithmetical work. Then, and not till then, will be the time to attend to questions of algebraic form.

But at no early stage can we afford to forget the danger of relapse into mechanical work. For this reason it is much to be wished that examining bodies would agree to lay less stress upon facility of manipulation in algebra. Such facility can generally be attained by practice, but probably at the price of diminished interest and injurious economy of thought. The educational value of the subject is sacrificed to the perfecting of an instrument which in most cases is not destined for use.

To come to particulars, we think that undue weight is often given to such subjects as algebraic fractions and factors. The only types of factors which crop up continually are those of

$x^2 - a^2$, $x^2 \pm 2ax + a^2$, and, generally, the quadratic function of x with numerical coefficients.

In most elementary algebra books there is a chapter on theory of quadratic equations in which a good deal of attention is paid to symmetric functions of roots of quadratics. No further use is to be made of this till the analytical theory of conics is being studied. Might not the theory of quadratics be deferred till it can be dealt with in connection with that of equations of higher degree?

Indices may be treated very slightly. The interpretation of negative and fractional indices must of course precede any attempt to introduce logarithms; but when the extension of meaning is grasped, it is not necessary to spend much more time on the subject of indices; we may push on at once to the use of tables.

It will be seen that our recommendations under the head of algebra are corollaries of two or three simple guiding thoughts; the object in view being,—to discourage mechanical work; the means suggested,—to postpone the more abstract and formal topics and, broadly speaking, to arithmetise the whole subject.

The omission of part of what is commonly taught will enable the pupil to study, concurrently with Euclid VI., a certain type of diluted trigonometry which is found to be within the power of every sensible boy. He will be told what is the meaning of sine, cosine, and tangent of an acute angle, and will be set to calculate these functions for a few angles by drawing and measurement. He will then be shown where to find the functions tabulated, and his subsequent work for that term will consist largely in the use of instruments, tables, and common-sense. A considerable choice of problems is available at once. He may solve right-angled triangles, work sums on "heights and distances," plot the graphs of functions of angles, and make some progress in the general solution of triangles by dividing the triangle into right-angled triangles. Only two trigonometrical identities should be introduced— $\sin^2\theta + \cos^2\theta = 1$, and $\sin\theta = \tan\theta \cos\theta$. In short, the work should be arithmetic, and not algebra.

Formal algebra cannot be postponed indefinitely; perhaps now will be the time to return to that neglected science. We might introduce here a revision course of algebra, bringing in literal equations, irrational equations, and simultaneous quadratics illustrated by graphs, partial fractions, and binomial theorem for positive integral index. Side by side with this it ought to be possible to do some easy work in mechanics. Graphical statics may be made very simple; if it is taken up at this stage, it might be well to begin with an experimental verification of the parallelogram of forces, though some teachers prefer to follow the historical order and start from machines and parallel forces. Dynamics is rather more abstract; a first course ought probably to be confined to the dynamics of rectilinear motion.

It is not necessary to discuss any later developments. The plan we have advocated will have the advantage of bringing the pupil at a comparatively early stage within view of the elements of new subjects. Even if this is effected at the sacrifice of some deftness in handling a , b , and c , one may hope that the gain in interest will be a motive power of sufficient strength to carry the student over the drudgery at a later stage. Some drudgery is inevitable, if he is ultimately to make any use of mathematics. But it must be borne in mind that this will not be required of the great majority of boys at a public school.

We beg to remain, gentlemen,
Yours faithfully,

G. M. Bell (Winchester); H. H. Champion (Uppingham); H. Crabtree (Charterhouse); F. W. Dobbs (Eton); C. Godfrey (Winchester); H. T. Holmes (Merchant Taylors' School); G. H. J. Hurst (Eton); C. H. Jones (Uppingham); H. H. Kemble (Charterhouse); T. Kensington (Winchester); E. M. Langley (Bedford Modern School); R. Levett (King Edward's School, Birmingham); J. W. Marshall (Charterhouse); L. Marshall (Charterhouse); C. W. Payne (Merchant Taylors' School); E. A. Price (Winchester); D. S. Shorto (Rugby); A. W. Siddons (Harrow); R. C. Slater (Charterhouse); H. C. Stele (Winchester); C. O. Tuckey (Charterhouse); F. J. Whipple (Merchant Taylors' School).

THE TEACHING OF NATURAL HISTORY.¹

By FRANK E. BEDDARD, M.A., F.R.S.

THE "Teaching of Natural History" implies that there are persons to be taught. But many of us who desire to be teachers find ourselves nearly in the position of the German professor who, commencing his lecture with the customary and introductory "Gentlemen," found, on raising his eyes, that it was desirable to substitute "Sir." It is, in fact, lamentably plain that whatever be the cause or causes, the teaching of Natural History is far from being at all general at the present time in this country. It is unsatisfactorily easy to prove this by a glance at various types of educational bodies. The proportion of those who take zoology in the final Honour Schools at Oxford to students of other subjects is minute; a merely negligible quantity of boys at several public schools require, or are requested to take, instruction in this subject. A glance at the lecture arrangements of the various University Extension Societies tells the same tale quite as emphatically. It is almost necessary to apologise for troubling you with statistics leading to so previously patent a conclusion. And yet there is no subject which is more ideally perfect as a vehicle for education than is biology. It trains the observing powers and insists upon microscopic accuracy; it trains the hand, for no student of natural history should be unable to use the pencil; finally, it exercises the memory, and offers problems, thus stimulating thought.

Yet, while the *Aeneid* of Virgil has been in the hands of almost literally every schoolboy—though possibly mainly as a happy hunting ground for irregular verbs—since fifty years after the poet's death, natural-history teaching is practically of the present and the immediate past, and has achieved but little popularity. It is important to ascertain the reasons for this lack of interest, as it should help us to formulate methods of teaching more in accord—it may be—with current ideas and the intellectual level of the majority of people. It appears to me that there are several causes which have operated in opposition to biological teaching which are based upon erroneous popular assumptions. There is, first of all, the impression voiced by that detestable vulgarism—"It doesn't pay," that the study of natural history leads to nothing; that it is mere trifling. That wittiest of Frenchmen, M. Alphonse Karr, relates in his *Autour de mon jardin* how he explained to the son of a neighbour that the "King bee" of the Fourth Georgic was really a queen, that the young bees were not produced from the carcase of a young heifer killed when the meadows were enamelled with their earliest flowers: how he begged the father to encourage his son, not, indeed, to neglect the harmonious verses of Virgil, but to read in addition some good treatise upon bees. "Sir," replied the father, "I cannot think of interrupting his studies." There is no creation here of men of straw; they exist and are far from uncommon. It might be well, therefore, to introduce into any course upon natural history some little account of such a matter as, say, the recent investigations upon the causes of malaria; and to add that the study of this complaint has shown that it is connected with certain minute organisms which have also been alleged to enter into that most fell of human diseases, cancer. Nor is it merely prudent to adopt such a suggestion; within certain bounds the anthropocentric conception of the universe, as it has been termed, is legitimate; where natural history is an assistant to material as well as to intellectual progress, it should be made use of. In doing this the "practical

¹ An address delivered by the author to the Conference of Science Teachers on January 9th, 1902, at the South-Western Polytechnic, Chelsea.

man" is soothed, and the process of smoothing down implies no dishonesty on the part of the teacher.

A second influence which has undoubtedly militated against the teaching of our subject is the alleged expense. Professor Huxley practically introduced the teaching of biology, and as far as the mass of the public are concerned, invented the very word. His elementary handbook, first brought out in 1875, demanded a series of tubes with re-agents, a microscope at least worth £5, a whole tribe of varied scissors and scalpels and other costly adjuncts. With literary subjects the sole cost is a text-book or two purchasable for two or three shillings. A sixpenny notebook and a pencil render the student equipped with all that is necessary. The attitude of the general public towards the matter of expense is crystallised into an unwillingness on the part of governors, trustees, and so forth to furnish expensive laboratories and costly microscopes for the prosecution of natural-history studies. The consideration of this series of facts leads at once to a matter of the highest importance to those who are engaged in the teaching of natural history. Is so much "plant" an absolute *sine qua non*? I remember a remark which Dr. Dohrn, the founder and director of the Zoological Station at Naples, made to me a good many years since. "It does not matter by which door you enter the temple of science, you must go over the whole house."

"Object lessons" have been at times given in schools of the elementary kind. This method of teaching might be extended, and if laboratories and apparatus are not forthcoming, the streets and back gardens must be pressed into the service, and temporarily converted into laboratories. The common horse and the donkey may be utilised. The differences between these two species are probably by no means matters of common knowledge; there are probably a good many persons who are as little familiar with their characters as they are with those of the Ocapí recently discovered by Sir Harry Johnston. A comparative study of this kind will lead to many of the methods of zoological enquiry. Careful observation and comparison, with description—accurately minute—of the external characters of these two familiar creatures should offer a desirable mental training. And it may be obviously extended with ease to cats and dogs, and to many invertebrate types. Instances need not be multiplied; what is urged is that, in default of money grants for apparatus and material, much can be done without. The consideration of these few examples, however, leads to another matter of the highest importance.

If there are so few persons anxious to study natural history, why not concentrate the attention rather upon subjects which do furnish an audience? Some years ago, in opening a public library, the late Prof. Huxley said that the object of such institutions was not to furnish shopgirls with novels, but to give the earnest student a chance. So with extended teaching in natural history—for the majority, even the vast majority, the teaching may fall on absolutely barren ground. But here and there the soil will be receptive. Is it not the business of public institutions to see that there are no mute, inglorious Darwins? These chances should be given even if they cost much; all the more it is our duty if it can be done with no loss in other respects. I would, in fact, venture to urge very strongly that schools should be, as it were, the collecting and sifting apparatus, and that from the mass of material gathered together and examined the few grains of gold can be extracted. Those few can subsequently be cared for.

Now the teaching that would be the most efficient in stimulating and recognising is unquestionably expert teaching. The lecturer who is only a lecture ahead of his class is not precisely the best teacher that can be devised. Those whose business it is to conduct classes in school cannot be expected to be competent to teach a great variety of subjects. Specialists are

quite necessary, and more particularly when the first beginnings of a subject are in question. There is in places a prevalent opinion that the more distinguished the teacher the more advanced should be his lectures, and that the groundwork may be safely relegated to the assistant. The precise converse of this is, to my mind, the real solution of the teaching question. It is comparatively easy to teach the higher branches—if you know them; but to start the beginner in a new subject requires on the part of the teacher a grasp of that subject which is quite impossible save after years of application to it. More markedly than in a number of sciences is this the case with natural history, a subject which is yet young and strong, and is increasing in size and breadth every day. To keep abreast of even the most elementary parts of the subject is beyond the scope of anyone who does not give the whole mind to the matter. Nor is this suggestion necessarily unpractical. Your philosophers may be peripatetic, and a number of institutions combine to utilise the services of a single expert. For some reason or other, "specialist" is a term which in this country involves mistrust. Broadly speaking, the nation does not accept Bacon's observation, that "The general Counsells, and the Plots, and Marshalling of Affaires, come best from those that are learned." But this introduces so much contentious matter, and there are probably so many corns and coat-tails present waiting to be trodden upon that I shall not pursue it further except to assert that the very term is frequently misunderstood. One constantly comes upon the notion that a specialist is an unpractical kind of person who only knows a minute bypath of science, and that, for choice, the most unprofitable. In that case it is true, as I once heard the late Prof. Chandler, of Oxford, say: "If a man knows nothing but beetles, he will go through the world and see nothing but beetles." This, however, is not a proper definition of a specialist. He is a person who with a general knowledge, without which progress is impossible, elects to pursue some special branch. This kind of specialist seems to me to be precisely the kind indicated by Bacon. That, too, is the sort of specialist that is wanted to teach an advancing subject like natural history. My very small contribution to this important debate may, in fact, be summed up by urging the general teaching of natural history, whether the audiences be small or large, so that chances may be given to those who would otherwise fail of an opportunity, and that the teaching can be carried on without much in the way of money grants, highly desirable though such are; but that it should be entirely in the hands of real experts, a suggestion which, I maintain, is not at all unpractical.

EXAMINATION PAPERS IN THE THEORY OF TEACHING.

THOUGH teachers in secondary schools are not yet compelled to submit themselves to examination in such subjects as the theory and practice of education, many of them are keenly interested in these studies. We believe our readers will be glad to study the questions set in the December examinations for teachers desirous to secure the diploma of the University of London and those for elementary-school teachers competing for King's scholarships with a view to enter one of the training colleges which prepare men and women for the work of elementary education. We have only space enough in this issue for the papers on the methods of teaching and school management set by the London University examiners; we hope to publish next month the questions on the history of education and mental and moral science.

UNIVERSITY OF LONDON.

EXAMINATION IN THE ART, THEORY, AND HISTORY OF
TEACHING: 1901.

Methods of Teaching and School Management.

PAPER I. (3 hours.)

- (1) If you had charge of a secondary school, what forms and records would you think it necessary to keep for the proper management of the school?
- (2) What do you consider the most efficient system of rewards and punishments in a school, regard being had to the ages of the children?
- (3) What are the principal uses which can be made of a blackboard in teaching? Point out the main abuses which should be avoided.
- (4) What forms of physical exercise do you consider most suitable for a school? To what extent should games be regarded as a substitute for other forms of physical exercises?
- (5) State your views on writing notes of lessons as a preparation for teaching. How far should they be used in the actual giving of a lesson?
- (6) Sketch the form of a history lesson on the Feudal System, or the Reform Bill.
- (7) In what manner and to what extent could out-door lessons be included in the ordinary curriculum of a school?
- (8) Draw out a scheme for the correlation of marks in different subjects in a terminal or yearly examination.

PAPER II. (3 hours.)

[Not more than EIGHT questions are to be attempted, of which FOUR are to be taken from Section A, and FOUR from Section B.]

A.

- (1) How far should specialisation be encouraged in a secondary school? At what period should it begin in different subjects?
- (2) Examine the comparative merits and demerits of *vivâ-voce* and written examinations.
- (3) To what extent should oral lessons and bookwork be combined in the teaching of History and Geography?
- (4) What is the proper sphere of home lessons? What dangers are to be avoided in their use?
- (5) What do you consider to be the function of a headmaster or mistress in the teaching of a school?

B.

- (1) Explain physiologically the effects of the defective heating and ventilation of a schoolroom, and show how these can be avoided.
- (2) What science lessons should be included in the curriculum of a secondary school having a classic and a modern side?
- (3) Bring out the different uses of questioning in teaching, and illustrate the abuse of questioning in giving a lesson.
- (4) Show in what different ways the reasoning powers of a child are exercised by the following: Mathematics, Natural Science, History, Languages.
- (5) To what extent, and in what form, is it desirable to introduce moral instruction into the ordinary curriculum of a school?

KING'S SCHOLARSHIP: 1901.

The Theory of Teaching. (2 hours.)

[Answer SIX questions, including the first, for which higher marks are awarded. If you answer more than SIX questions in all, only the SIX answers coming first on your paper will be revised.]

- (1) Draw up an outline of a lesson for older scholars upon one of the following subjects:—
 - (a) The growth of any meadow flower.
 - (b) The determination of the four cardinal points of the compass; (1) for children who see the sun frequently; (2) for those who live in large towns.
 - (c) A Barometer.
 Or, for Infants, one of the following:—
 - (a) A bunch of Summer Flowers.
 - (b) A loaf of Bread.
 - (c) A cup of Tea.

(2) In teaching Division, how may the distinction between *measuring* and *sharing* be made clear? Point out the insufficiency of the following rule and give a correct statement: To find the speed of a ship divide the distance by the time.

(3) In teaching Geography, what use have you made of models purchased, or of your own construction?

What other means have you employed to enable children to see that the terms and descriptions you use apply to real and not imaginary things?

(4) What object do you keep in view in giving a reading lesson to a class of scholars (a) of about twelve years of age, (b) of about eight years of age?

(5) How may lessons in Dictation be given with profit to the children in (a) the lower, and (b) the upper classes of a school?

(6) Describe the chief signs of good and bad discipline in a class.

(7) How may teachers assist children in their play?

(8) Describe any visit that you have made with the scholars to a museum or other place of interest.

What educational advantage do you think that the scholars obtained?

(9) What is the usual length of lessons in infants' schools or classes?

What signs indicate that a lesson is too long? What interval is allowed between successive lessons, and how is it used?

CAMBRIDGE LOCAL EXAMINATIONS.
SET SUBJECTS FOR 1902.

THE regulations for the Cambridge Local Examinations in December, 1902, show that among the most important alterations in the Syllabus are the introduction of an oral examination in French and German for Senior candidates, and the addition of agricultural science, book-keeping, mensuration, surveying and shorthand to the subjects of the Senior examination. Both Senior and Junior candidates may in the future be examined in the history of the British Empire. The special subjects prescribed for 1902 are as follows:—

Preliminary.

- Religious Knowledge.*—(a) St. Mark, (b) I. Samuel i.-xv.
English Author.—Scott, "The Lady of the Lake," Cantos i. and v.; or, Macaulay, "Horatius, Lake Regillus and The Armada."
English History.—Outlines, 800-1215 A.D.
Elementary Latin.—Caesar, "De Bello Gallico," I., chaps. 1-29; or, Phaedrus, I. (omitting 18 and 29) and II.
Elementary French.—Malot, "Remi et ses Amis," chaps. 5-7.
Elementary German.—Hauff, "Die Karavane (Die Geschichte von Kalif Storch)" and "Die Geschichte von dem kleinen Muck").

Junior.

- Religious Knowledge.*—(a) I. Samuel; (b) St. Mark; (c) Acts of the Apostles, xiii.-xxviii.
English Author.—Shakespeare, "A Midsummer Night's Dream;" or Scott, "The Lady of the Lake."
English History.—Outlines to 1215 A.D.
History of British Empire.—Outlines, 1492-1784 A.D.
Roman History.—Outlines, 266 B.C.-133 B.C.
Geography.—Great Britain and Ireland; America, south of Mexico; and Australasia.
Latin.—One of—Caesar, "De Bello Gallico," I.; Ovid, "Metamorphoses," VIII.; Virgil, "Aeneid," V.
Greek.—One of—Xenophon, "Anabasis," I.; Homer, "Iliad," IX.; Euripides, "Alcestis" (omitting lines 86-136, 213-244, 435-475, 569-605, 962-1005).

- French.*—Eckmann-Chatrian, "Waterloo," chaps. xiv.-end ; or, Malot, "Remi et ses Amis."
German.—Hauff, "Die Karavane" (omitting "Die Errettung Fatme's"); or, Schiller, "Maria Stuart."
Spanish.—Hurtado de Mendoza, "Morceaux Choisis de la Guerre de Grenade" (Hachette).

Senior.

- Religious Knowledge.*—(a) I. Samuel ; (b) St. Mark ; (c) Acts of the Apostles, xiii.-xxviii.
English Literature.—Addison, "Arnold's Selections from the Spectator" (Clarendon Press), pp. 1-62, 111-122, 378-394 ; Shakespeare, "A Midsummer Night's Dream" ; Milton, "Comus, Lycidas, Sonnets 1, 2, 8-23."
English History.—To 1215 A.D.
History of British Empire.—1492-1784 A.D.
Roman History.—266 B.C.-133 B.C.
Geography.—As in Junior.
Latin.—Ovid, "Metamorphoses," VIII. ; Terence, "Hautontimorumenos" ; Livy, II., 1-41 ; Cicero, "Pro Milone" (students must select one verse and one prose author).
Greek.—Homer, "Iliad," IX., X. 1-298 ; Euripides, "Alcestis" ; Thucydides, VII., 1-54 ; Xenophon, "Memorabilia," II. (students must select one verse and one prose author).
French.—Molière, "Le Misanthrope" ; Eckmann-Chatrian, "Waterloo," chap. xiv.-end.
German.—Schiller, "Maria Stuart" ; Sybel, "Prinz Eugen von Savoyen."
Spanish.—Hurtado de Mendoza, "Morceaux Choisis de la Guerre de Grenade" (Hachette) ; Cervantes, "The Adventures of the Wooden Horse and Sancho Panza in Barataria" (Clarendon Press).

RESOLUTIONS OF RECENT CONFERENCES.

Headmasters' Conference.

THE last annual meeting of the Headmasters' Conference was held in the Senate House at Cambridge under the presidency of the Rev. H. W. Moss. During the two days' meetings the following resolutions were adopted:—

- (1) That the new local authority for secondary education should be so constituted as to secure for each locality the advantages of higher education, and that with this view it should not be constituted by an election *ad hoc*. A majority of its members should be members of the county council, and it should include an adequate proportion of persons having a practical knowledge of secondary education.
- (2) That secondary schools should have the right of appeal from the local to the central authority.
- (3) That in all language examinations, ancient or modern, imposed by external bodies for admission to the Universities or professions, prescribed books should be abolished.
- (4) That a committee be appointed to confer with representatives of the London Chamber of Commerce and the Associated Chambers of Commerce on the subject of commercial training in public schools.
- (5) That a higher standard of English should be required on entrance into secondary schools ; and that the study of English ought to receive more encouragement at the schools themselves.
- (6) That the new regulations for "schools of science" are deserving of the serious consideration of members of the Conference.

Incorporated Association of Headmasters.

The annual general meeting of the I.A.H.M. was held at the Guildhall, London, on January 9th and 10th, under the presidency of Dr. Gow. The following resolutions were adopted:—

- (1) That the next Education Bill provide: (i.) For the efficient control of all secondary schools ; (ii.) that every school under the supervision of a local authority should have a right of appeal from the local authority to the Board of Education, in matters of curriculum and administration, as well as of finance.
- (2) (i.) That for the inspection of secondary schools steps should be taken by the Board of Education to make effective the choice of inspection by a University organisation, expressly provided under Clause 3 of the Board of Education Act ; (ii.) That such inspection should be allowed to take the place, if so desired, of the annual examination ordered by the scheme of the school.
- (3) That the Board of Education should be empowered to adopt for teachers in public secondary schools in England a scheme for giving analogous advantages to those of the scheme of the Welsh Central Board by means of the aid afforded by the local authority.
- (4) That this association welcomes in Clause 73 of the Directory of 1901-2 a desire on the part of the Board of Education to aid science teaching in schools without detriment to other subjects in their curricula.
- (5) That this association desires to draw attention to the unsatisfactory condition of service of engineer officers in H.M. Navy, and to urge upon the Admiralty that, until the service is made more attractive as to both the *status* and the pay of these officers, there will be a dearth of the most desirable candidates and a great loss of efficiency to the nation.
- (6) That in all language examinations, ancient and modern, candidates may pass without prescribed books.
- (7) That this association desires to press upon the Universities and other examining bodies the desirability of greater elasticity in their regulations as to mathematical teaching, and is of opinion that to insist upon adherence to the order of propositions in Euclid is mischievous.
- (8) (i.) That instruction in modern languages will take the rank due to it only if its disciplinary value is emphasised at least as much as its utility ; (ii.) That with a view to this end the Universities would render valuable help by allowing more scholarships for success in this branch of study.

Incorporated Association of Assistant-Masters.

At the annual general meeting on January 11th, at St. Paul's School, Hammersmith, the following resolutions were passed:—

- (1) That the interests of education demand a reform in the system of tenure in secondary schools.
- (2) That this meeting looks to the Government to redeem the pledge given by Mr. Balfour last Session to the effect that a measure dealing with the organisation of education should have a very early and honourable place in the legislation of the coming Session.
- (3) That the areas of the local educational authorities should be not less than a county or county borough, and that the basis of the said authority should be the county or borough council.
- (4) That no educational committee of a local authority will be competent to deal satisfactorily with secondary schools which does not contain a certain number of persons who are, or have been, engaged in teaching in such schools.
- (5) That the interests of education and financial economy alike demand that provision should be made for safeguarding the position and efficiency of existing secondary schools.

- (6) In favour of increased remuneration for teachers.
 (7) In the absence of a national system of pensions for teachers, recommending the adoption of a pension scheme similar to that of the Welsh Central Board.
 (8) That in the teaching of Latin the Roman pronunciation should be used in our schools and universities.

SCIENCE TEACHERS IN CONFERENCE.

THE fourth annual Conference of Science Teachers arranged by the Technical Education Board of the London County Council was held on January 9th and 10th, at the South-Western Polytechnic, Chelsea. Since the inauguration of these meetings the attendance has steadily increased, and during the meetings of this year four hundred teachers signed the visitors' book. The subjects of the discussions for this year were not of the general interest of those of previous conferences, and we are unable to record much improvement in the character of the discussions. There is, moreover, a new cause for complaint. The opening addresses of this year were often too long. Two hours, the length of separate meetings, is not, under the best conditions, very long for the reading and discussion of two papers, and if, as happened on more than one occasion this year, the openers take up three-quarters of an hour each, the discussion is so curtailed as to be worthless. The exhibition of home-made apparatus has in previous years been one of the most valuable events of the conference for the practical teacher; we were sorry to find, therefore, that the exhibition of this year was very inferior to those with which we have become familiar. We think that it would repay the organisers of the conference to give the greatest attention to making this part of the proceedings a success.

The event of the conference was the short address, at the third meeting, of the Principal of the University of London, Prof. A. W. Rucker, F.R.S., who pleaded, with all the grace for which he is justly famous, for the due recognition by teachers of science of the claims of art and literature in the education of their pupils. It is true that science teaches us how to observe and to reason from the observations we have made, but for the due expression of this knowledge we are dependent upon drawing and language. If men of science always adopted the tone of Prof. Rucker's address we should never hear of the conflict between the humanist and the man of science.

It is unnecessary to enumerate the titles of the papers which were read at the conference, since they were given in our last issue (p. 28). The programme as there given was adhered to with the exceptions that Sir Henry Roscoe's place was taken by Prof. Tilden, F.R.S., and that, owing to the illness of the Countess of Warwick, the last meeting was presided over by Prof. Armstrong, F.R.S.

Professor Rucker presided over the second annual Conference of Public-school Science Masters at London University on January 18th, which was very well attended. At the first meeting in the afternoon the communications practically dealt with but two subjects, namely, the shortcomings of the science examinations for the Army and for University Scholarships. The trend of the paper on "Science in Army Examinations," by Mr. C. J. Gardiner (Cheltenham), and the long discussion which followed it, may be well judged by the resolutions which were passed at the end of the meeting:—That the Conference is of opinion that (1) the present army science-examinations are unsatisfactory; (2) the examination lays insufficient stress upon the practical side; (3) quantitative operations should be introduced; (4) more physics should be made compulsory; (5) the resolutions should be sent to the Committee now sitting.

A resolution passed last year was repeated in the following words in order that it might again be sent to the Civil Service

Commissioners: "That so long as the present distinction between the written and practical examinations be maintained the marks allotted to the two parts be published separately."

The deplorable specialisation upon the part of school-boys caused by the present methods of conducting scholarship examinations was shown by Mr. M. D. Hill (Eton) in his paper on "The Connection between University Scholarships and School Work in Science," and by the "Specialist's Time-table," copies of which Mr. G. Stallard (Rugby) circulated among the members of the Conference. As an outcome of this paper a resolution was passed to form a small committee to deal with the subject of scholarship examinations and to communicate with the authorities of Oxford and Cambridge.

In order that the opinion of the assembled masters might be more useful, and have more weight than even Professor Rucker at the outset claimed for that of the Conference, an Association of Public-school Science Masters was formed in the evening, and Professor Rucker, upon being invited to do so, became its president for 1902.

ITEMS OF INTEREST.

GENERAL.

IN our abstract last month of the Return published by the National Association for the promotion of Technical and Secondary Education dealing with the scholarship schemes of English County and County Borough Councils, we remarked that "the return brings out clearly one grave defect in the scholarship schemes of the different councils," and we went on to quote from the report "the provision of facilities for the passage of students from technical schools to higher colleges or universities is distinctly faulty." The compiler of the return directs our attention to the fact that this quotation refers only to the scholarship schemes of County Borough Councils and has not—in the return itself—the general application which we gave it. While admitting the slight ambiguity in our abstract, we do not consider that the truth of our remark is affected by the compiler's distinction. The statistics just published by the Association of Technical Institutions, to which reference is made in another part of this issue (p. 55), show conclusively that the amount of higher technical instruction given in this country is ridiculously inadequate, and unless not only County Borough Councils, but County Councils also, give earnest and immediate attention to this defect we cannot hope to compete on anything like equal terms with German and American manufacturers.

THE General Medical Council has had under consideration for some time the question of the best way to educate medical students. Recognising the magnitude of the amount of knowledge which the medical student is expected to assimilate during his period of training, which extends on an average to but five years, an important section of the Council has recently proposed to make greater demands upon the secondary school, and to relegate to the school period the teaching of elementary physics, chemistry and biology. A student entering a hospital with a thorough and practical acquaintance with the broad principles of these fundamental sciences is in a position at once to enter upon the study of his professional subjects, in this way relieving the enormous strain which has characterised the years of training in the past. This suggestion has not met with the approval of a number of men of science and teachers of science, who have sent a memorial to the Medical Council recommending that the instruction in physics, chemistry, and biology be retained as part of the medical curriculum. It is to this memorial the Rev. T. N. Hart Smith, Headmaster of Epsom College, makes reference in his letter, printed on p. 79, to which we direct

attention with much pleasure, dealing with the whole question from the point of view of the secondary school.

THE Annual General Meeting of the Modern Language Association was held at the College of Preceptors on December 19th and 20th last. Professor Rippmann read a paper on "The New Method of Teaching Modern Languages," in which he advocated a closer study of the child, a better grounding in the mother tongue, and the learning of a modern language as the first after the mother tongue. This modern language, he suggested, should be German rather than French, as obtained at present, because of its nearer kinship to English and of the greater ease of pronunciation. Two papers by Messrs. Atherton and von Glehn describing their experiences of introducing the new method at Haileybury and Merchant Taylors' respectively followed. Mr. Atherton considered conversation a great mental spur, but that continual translation from English into French should be retained. Mr. von Glehn proposed a resolution that a return be made of all modern-language teachers in the United Kingdom actually teaching classes on the lines of the new method. The second day the President, the Rev. Dr. Mahaffy, delivered his address, urging amongst other points that in all modern-language examinations there should be three tests only—conversation, dictation and composition. He proposed that Greek and Latin should be taught more colloquially, and then difficulties of pronunciation would be resolved. Mr. de Sélincourt, of Oxford, read a practical paper on "The Teaching of English Composition," which was followed by some appropriate experiences detailed by Mr. F. Storr and Mr. H. W. Atkinson.

MODERN-LANGUAGE masters are divided in their views of the value of international correspondence, whose chief advocate in France is M. Paul Mieille, of the Lycée de Tarbes. With certain pupils, however, its use has been incontestable, especially where the careers of the two pupils are likely to be identical. If the corrections are honestly done, each pupil gets a knowledge of certain familiar phrases that he is not likely to meet with in his ordinary school work. A small publication has just started its second year of existence in France, the object of which is to foster this international correspondence. It is called *Les Quatre Langues*, and appears twice a month; it costs six francs a year, and the publishers are Messrs. Nony, 63, Boulevard St. Germain, Paris.

THE teaching of English in French schools is becoming more and more confined to Frenchmen, who, in accordance with the regulations of the education authorities, are required to take up the study of "set-books" in the examinations for the diploma which all teachers must possess. For the next three years candidates for diplomas essential for an appointment as professor of English in second-class schools will be examined in Mrs. Browning's "Aurora Leigh," Thackeray's "Four Georges," Macaulay's Essays on Milton and Warren Hastings, and Pinero's "The Princess and the Butterfly." The diploma for normal and high-class schools requires examination in the following works:—Aikin and Barbauld's "Evenings at Home" (selections), Miss Corner's "Every Child's History of England" (selections), Wordsworth's "Michael, a Pastoral Poem," and Longfellow's "The Village Blacksmith," "The Rainy Day," "The Curfew," "Daylight and Moonlight," "The Arrow and the Song," "A Psalm of Life," "The Wreck of the Hesperus," "The Lighthouse," and "Daybreak."

A SUCCESSFUL conference arranged by the Teachers' Guild was held at the College of Preceptors, on January 13th and 14th. Among the numerous and varied discussions may be mentioned those on "Holiday Courses: Their Advantages and Disadvantages" opened by Messrs. M. E. Sadler and J. W. Longsdon,

on the "Inspection of Secondary Schools" introduced by Mrs. Bryant and the Rev. R. D. Swallow, and on the "Teaching of English Literature in Schools" started by Messrs. P. A. Barnett and H. Courthorpe Bowen. As is customary in England the audience were chiefly made up of ladies, who, in some of the debates at least, took the most prominent part. No thoughtful person can attend a meeting specially designed for the purpose of educational discussion without some disappointment. It seems to be postulated that a discussion may take place on any subject and at any distance from that subject—and the majority of the discussions on educational questions during the past vacation have been remarkable for the success with which the speakers avoided the question nominally before the meeting. If it were not for the admirable papers with which the debates are actually begun, we should be inclined to doubt the desirability of holding meetings of the orthodox character.

THE Private Schools Association held their annual meeting on January 9th, at the Westminster Palace Hotel, when the new President, Mr. G. C. T. Bartley, M.P., delivered his inaugural address. He said it cannot be too clearly emphasised that this association puts the efficiency of secondary education in front of all private interests; but since private schools have largely initiated efficiency in the past, it would be a loss to the community if they were superseded by State-aided or municipally subsidised schools. They contend, therefore, that secondary schools started by local authorities ought to be self-supporting, or private schools should receive grants to put them on the same level as the new public schools. Mr. Bartley thinks that it will conduce to the maintenance of freedom and individuality in the education they give if private schools receive no grants, which, he thinks, tend to produce a stereotyped form of school. We are glad to hear that the Private Schools Association is steadily growing in numbers and that prospective legislation is leading the members to take even more interest in educational questions.

THE annual meeting of the Geographical Association was held at the College of Preceptors on January 15th. The report for 1901 adopted on that occasion shows that while eighteen members have been lost to the Association during the past year, seventy-four new members have joined, and the total is now 190. The committee are endeavouring to establish branches in all parts of the empire, and have made a beginning with a small society at Melbourne, Victoria. The Right Hon. James Bryce, M.P., delivered the annual address to a large audience on "The Importance of Geography in Education," in which he dealt with three aspects of the subject, regarding geography as the gateway to science, the key to history and the basis of commerce. Dr. Hugh R. Mill, in proposing a vote of thanks to Mr. Bryce, treated the subject of the latter's address from the point of view of a geographer. The proposal was seconded by Mr. T. G. Rooper, who said that his experience showed the lecturer to be too optimistic in thinking that geography was now generally taught by practical methods.

AT the last annual conference of the Association of Headmasters of Preparatory Schools, a lengthy discussion took place in reference to the holding of examinations for the Navy at private schools in addition to the ordinary centres at London and Portsmouth. The Association appears to feel that by such a plan a great advantage is given to the pupils of certain schools. As the result of a deputation from the Association to the Civil Service Commissioners, it is unlikely that for the future examinations will be held outside the recognised centres.

NEW science buildings in connection with the Watford Endowed Schools were opened, in December last, by Sir William Abney, K.C.B. The new rooms comprise a lecture room, a physics laboratory, museum and balance room, a preparation

room and a dark room, which, with the chemical laboratory opened in 1892, form an admirable set of rooms suitable for all the purposes of science teaching. The governors have now expended upwards of £3,000 on the science side of their school, two-thirds of which represents the cost of the recent additions.

THE Incorporated Association of Headmasters recently addressed a letter to the Board of Education to ask whether the Secretary will consent to receive a deputation from the Association on the subject of the tenure of masterships in endowed schools. It is pointed out that the Board of Education is now called upon to initiate, as well as to authorise, schemes which contain provisions regulating the tenure of masterships in endowed schools. The practice under the Charity Commission has been to assign to the governing body, on the one hand, full responsibility for both the appointment and the dismissal of the headmaster, and to assign to the headmaster, on the other hand, full responsibility for the appointment and the dismissal of the assistant-master. Certain local authorities have passed resolutions suggesting changes in the provisions for the appointment and dismissal of assistant-masters in schools under schemes. It thus appears that, besides the two administrative agencies recognised under endowed-school schemes—viz., the governing body and the headmaster—there are other parties whose claims to an interest under such schemes will doubtless receive the attention of the Board when school schemes are either made or amended. In these circumstances the Association request permission to state reasons why the Board might see fit to refer the question of tenure to the Consultative Committee before introducing into existing endowed-school schemes changes affecting the conditions of such tenure.

A LITTLE pamphlet entitled "Helps to Self-help for Teachers," published at the office of the Teachers' Guild, contains a number of useful recommendations, drawn up by the Thrift and Benefits Committee of the Guild, showing teachers how they may through the Guild utilise their savings in the direction of assurance and investment. The Guild Sickness and Accident Fund which has now been established should prove of great assistance to teachers.

In the matter of endowments for secondary education Buckinghamshire appears to be one of the worst endowed counties in England. While, for instance, in the neighbouring counties of Bedfordshire and Oxfordshire the amount of endowment per thousand of population is £94.1 and £51 respectively, Bucks can only boast of £8.2. As a probable consequence of the small endowments, no endowed school in the county is at present equipped with adequate means to give an education of a practical character, and the existing buildings lack laboratories for science and workshops for manual instruction. We understand, however, that the Bucks County Council has approved of a scheme which includes the provision of ten efficient modernised secondary schools, having chemical and physical laboratories and workshops. Fortunately, a considerable unexpended balance of the "whisky" money is available, from which building grants for these desirable purposes can at once be allocated.

ONE of the most interesting sections of the latest report of the Surrey Technical Instruction Committee is that referring to Continuation School Gardens. During the eight years since the inauguration of this work, there has been a steady advance in the productiveness of the adults' cottage-gardens and allotments throughout the country. Indeed, no better gardens than those of Surrey are to be found anywhere. The advance made by youths has, the report informs us, been still greater. The best garden this year was that of Herbert J. Cæsar, the son of

the gardener-schoolmaster of Hale. Mr. J. Wright, who reports on the teaching of horticulture, speaks of the "premier's" garden as "the best work that has ever been seen in a school-garden plot in Surrey, if not elsewhere." In recognition of this fact, this successful young gardener is the recipient of the silver Banksian medal of the Royal Horticultural Society.

THE recent exhibition of students' works at the Camberwell School of Arts and Crafts in connection with the London Technical Education Board enabled the visitor to form an idea of the variety of subjects catered for at this institution. In addition to classes in such subjects as building construction, cabinet-making, house-painting, masonry and plastering, which more commonly engage the attention of technical schools, students are at Camberwell instructed in black-and-white design, wood-inlaying, embroidery, lettering and illuminating, and other applied arts. The school appears to be doing excellent work.

THE need for educational reform is not only recognised as one of the most pressing problems of home politics, but, as a recent article in *The Times* by a correspondent in Calcutta shows, the authorities in India are seriously concerning themselves with the same problem. A conference of the highest official educationists and the vice-chancellors of the chief Indian universities, held at Simla and presided over by Lord Curzon, the Viceroy, has thoroughly discussed the educational needs of India. Lord Curzon is strongly in favour of the appointment of a Director-General of Education to advise the Government of India on educational matters, though he does not, it would appear, propose that such a director should possess authority to act. We are glad to notice that the writer of the article insists that the vital part in the education of any people is the work done by the teachers. In the absence of competent, trained teachers, with an assured position, no administrative changes can have much effect in the direction of improvement. And it is in these particulars that Indian elementary and secondary education are most defective. The university must be regarded "as an engine for the general enlightenment and elevation of the people"; teaching must be regarded "as at least an honourable career, and one which opens up reasonable prospects of advancement." But this is not merely to be effected by increasing the salary of the schoolmaster, for "there are probably many teachers, and those among the best, who would be contented with low pay if only a position of some dignity and consideration were assured to them."

As was to have been expected, the King's Speech contained a reference to the subject of education. The gentlemen of the House of Commons were informed that "proposals for the co-ordination and improvement of primary and secondary education" would be laid before them. It is to be hoped that the proposals of this year may result in the fulfilment of the hopes entertained for so long by earnest educationists.

SCOTTISH.

THE Scotch Education Department have issued a circular calling the attention of teachers to general faults which have been brought to their notice by the examiners in mathematics at the Leaving Certificate Examination. These points may be briefly summarised as follows:—(1) Detailed calculations were wholly or partially omitted, and must have been worked on separate pieces of paper; (2) When detailed work was given, it was set down without any explanation in words, and was often so badly arranged as to be unintelligible; (3) In a great number of cases no attention was paid to careful and accurate figures in geometry and other subjects which require figures; (4) In a few instances, especially in trigonometry, answers had been

manipulated so as to make it appear as if the desired result had been obtained, although the candidate must have known that this was not the case. The examiners have been instructed to penalise severely papers which in future show any of these faults.

IN the course of the proceedings at the opening of the new Irvine Academy, Mr. Parkes Smith, M.P., gave an able address on the aims of education and the problems of higher education. The aim of education, he held, was not to teach children their trade or business, but to give them the capacity for learning it thoroughly. Specialised commercial or industrial knowledge was entirely outside the functions of any school. For one thing, the apparatus of the school was inadequate, the knowledge of the teachers vague, general and theoretical, and the field of instruction so enormous that only the merest superficial survey was possible. What will be required in actual life by 99 persons out of 100 is an intimate familiarity with a very small corner, but what that corner may be cannot be known till the boy is actually settled in his work. It is waste of time to try to make boys inferior clerks, or to teach them by amateur workmen, methods with their tools which they will have to unlearn whenever they go to the workshop. Playing at business or trade was the worst possible training for the stern realities of actual work. What was wanted as the result of school life was not knowledge—which could be at best but of the flimsiest character at fifteen or sixteen years of age—but a capacity for acquiring knowledge, and the acquisition of habits of application, exactness and method, which would be of infinite value in every department of work.

THE subject of commercial education is still being kept to the front by the Joint Committee of the Edinburgh Chamber of Commerce and the Merchant Trust and Heriot-Watt Schools. Their report last year was an exceedingly exhaustive and valuable contribution on this vital question, and the Committee are now pressing upon the Scotch Education Department the consideration of the conclusions therein arrived at. At a recent interview with Sir Henry Craik, the Committee learned what steps were to be taken by the Department to meet the views of the mercantile community, and Sir Henry took the opportunity at the same time of impressing upon the deputation the important part which employers, merchants and others who required to engage lads for their offices, occupied in the success of any scheme. He made it very plain that, unless employers did their part and insisted upon the proper degree and standard of efficiency of their apprentices, any scheme which the Education Department might be prepared to adopt would certainly not succeed, at all events to the extent which it would do otherwise.

THE annual congress of the Educational Institute took place this year in the picturesque Border town of Dumfries. The Congress programme was an exceedingly varied and interesting one, the most important questions dealt with being the "Training of Teachers" and "University Extension and Reform." Mr. Williams, Principal of Dundas Vale Training College, explained the changes made by the recent departmental circular in the training of teachers, and acquiesced generally in its recommendations. In the discussion which followed strong objection was taken to the proposed division of the teaching profession into two divisions, the university trained and the non-university trained. The position taken by most of the speakers was that all candidates for training should pass the University Preliminary, and should then proceed to the University for their theoretical training and to the training college for their practical instruction, and a resolution to this effect was carried almost unanimously.

MR. HALDANE, M.P., in his address on "University Extension and Reform," naturally traversed some of the ground covered in his recent address at Liverpool on "English and Foreign Universities." But at Dumfries his object apparently was to show how an improved type of university could and should permeate all branches of education from the lowest to the highest. Neither by their traditions nor by their present attitude were the universities fitted to play that part. They would have to recognise that their work was co-operative and co-ordinate, and that they were called upon to play a great and noble part in moulding the character of the whole education of the country. What he would like to see would be the welding of the educational system of the country into one complete whole in which elementary, secondary and university education would be indissolubly bound together. Lord Balfour, in his Higher Education Bill of last Session, had made no provision for incorporating a university element on the local committees, and he trusted this defect would be remedied in this Session's Bill. In addition he would like to see a clause introduced setting up central councils, one in each university centre, composed of representatives of the three grades of education, elementary, secondary and university. Such boards need not be administrative, but advisory, like the Central Board in Wales. Teachers should receive all their theoretical training in the universities, and the training colleges should be the clinical schools where the practical work was obtained.

IRISH.

THE first year of the new century will certainly be memorable in Ireland for educational changes and rumours of changes so numerous that one might almost look for an educational armageddon. The close of the year has seen the various organisations of Intermediate Teachers discussing the new rules and programme of the Intermediate Board which came in force last summer, and suggesting amendments for the year 1902-3. While regretting, as the circular of the Schoolmasters' Association puts it, "that so many radical changes have been made simultaneously," a fact which "has caused great inconvenience in all schools, and may make the scheme unworkable in many," most schools recognise that the new departures are well meant and likely to lead to great improvements. But like all schemes framed without expert knowledge of schools and school children, the reforms of the Intermediate Board contain some serious practical difficulties. For this the Board is not altogether to blame. Before finally passing the new rules, they consulted the heads of twelve representative schools, but it is an open secret that the criticisms offered were so mutually destructive as to be of no help. On the other hand, the Board was in too much of a hurry, and the various associations of teachers are generally united in wishing to postpone further changes threatened and to mitigate the effects of those already made. They are also wise enough in their generation to attempt to secure as far as possible united action.

THE Dublin Branch of the Teachers' Guild was the first in the field, and drew up a Memorial to the Board, copies of which were sent in December to the heads of 250 different schools throughout the country, so that every school of any importance might know what line of criticism it was taking. This Memorial has met with very general approval, and the Schoolmasters' Association, which held its annual meeting on December 27th, in drawing up a memorial of its own, adopted nearly the whole of its suggestions. We select the following as some of the most important points. In previous years a candidate could pass the Intermediate Examination by obtaining a pass, 25 per cent., in four subjects, there being only one set of papers. In future a candidate must pass in six subjects,

and there are two sets of papers, pass papers for which the pass standard is 40 per cent. (but 30 per cent. for German and Greek), and honour papers for which the pass standard is 25 per cent. It is obvious that the pass papers should be very much easier than the old papers; in fact, a comparison of the standards, 4 x 25 and 6 x 40, shows that they should be more than twice as easy. As it is generally believed that the Board are not anxious to raise the pass standard, they should not overlook this point.

ANOTHER criticism is of the greatest importance. The Board wishes to encourage the home reading of English literature. Excellent! But how? The following are the books: Preparatory Grade (age under 15): Byron, "Childe Harold," cantos II. and III.; Coleridge, "Ancient Mariner"; Scott, "Waverley." Junior Grade: Dickens, "Tale of Two Cities"; Lamb, "Essays of Elia"; "The Golden Treasury of Songs and Lyrics," book IV. Middle Grade: Steele, "The Tatler"; Swift, "Battle of the Books"; "The Golden Treasury," book III. Senior Grade: Shakespeare, "Henry IV," parts I. and II.; a selection from Bacon's "Essays"; "Golden Treasury," book I. In consequence of representations from Roman Catholics, selections from Wordsworth's "Excursion," Milton's "Paradise Lost," and Newman's "Poems," were substituted in the various grades for the "Golden Treasury." Does any sane teacher think that Smith Centesimus when he gets home, and has finished his home sums and Latin and French and other English work (for there is also plenty of other English literature prescribed for school), &c., &c., will take up "Childe Harold," or the "Golden Treasury," or Bacon's "Essays," or the "Excursion," or Newman's "Poems," out of pure amusement for light reading or self-improvement?

THE Dublin correspondent of the *Athenaeum* was unfair to Irish schoolmasters in this connection, and entirely missed the point of their objection to Palgrave's "Golden Treasury." The Roman Catholics may object to the book *per se*, but the Protestant objection is that here given. The books set down are for home reading. The average boy will not read them at home. If they are read in school (as in most schools is the case), then there is not only a congestion of English literature, but the idea falls through. But further, as English is not a compulsory subject, many candidates are naturally fighting shy of it, and "English" includes not only Literature, but Geography and English and Irish History. It cannot be desirable that Irish boys should grow up and leave school with no knowledge of the geography and history of the Empire to which they belong. The home-reading courses should therefore be remodelled and made shorter and more suitable.

A THIRD point to which objection is taken is the preference given to German over French, and it is urged that they should be put upon an equality. Two other important points relate to questions of policy rather than teaching. The Board propose to pay exhibitions (1) through school managers and not directly to their winners, and (2) only to exhibitors continuing their education, and to secure the latter, there are elaborate and unnecessary safeguards. The reason for (1) is not apparent. The school manager receives his reward in results' fees, and has no claim to share the exhibition, and (2) is not fair to an exhibitor who cannot remain at school any longer, and who is surely entitled to some reward for good work. An excellent compromise is suggested, viz., that half the value of the exhibition be paid forthwith to the winner, and the other half six months later contingent upon satisfactory evidence being produced that he is continuing his education.

THE other point is the proposal of the Board to discontinue the publication of the results of the examination. The only

argument in support of this is that publication leads to 'touting.' This is a confession of weakness on the part of the Board, since the exposure and punishment of a school or manager guilty of such an offence would be a very effective object-lesson. On the other hand, the publication has in the past helped to build up the confidence of the public in the system, has led not infrequently to the correction of examiners' mistakes, and has been of very material assistance to schoolmasters, pupils and parents, in appraising the merits of various candidates and schools.

WELSH.

It is stated that from the Aberystwyth Intermediate School there are now 25 past pupils who have become students in the University College at Aberystwyth. This instance shows the importance of the new county schools (which are now 94 in number) as feeders for the University Colleges. At the annual distribution of prizes at the Aberystwyth County School, Principal Roberts stated his opinion that in the new Education Bill it would be unwise to introduce the limitation of a twopenny rate. Such a limitation would be absurdly inadequate for counties of low rateable value such as Cardiganshire.

ANOTHER interesting speech is one lately delivered at Dolgelly by Prof. Ellis Edwards, in which was pointed out the debt which commerce owes to literature. It was the Oxford student, Adam Smith, trained in mathematics, natural philosophy and moral philosophy, who established the idea of Free Trade for British commerce. The East India Company was started in an age of new religious and literary forces. The earliest Chamber of Commerce was opened at Glasgow, in a country where the education was eminently philosophical, classical and religious. Germany's re-awakening was not brought about by commerce, but by poets and philosophers. Helmholtz himself said that students who had been trained in science at first took the lead in it, but that after a time those who had been trained in classics surpassed the scientific men in science itself. For Welshmen, born lovers of literature, nothing but sheer impossibility should keep them from an education which would make them conversant with some at least of the chief inspirations of Greece, Rome and England.

PRINCIPAL REICHEL, of Bangor, has expressed a doubt as to whether the present generation is athletic. "We have," he says, "plenty of athletics, but we no longer do them ourselves. We pay a few highly-trained experts to do them for us." He is of opinion that the average Frenchman or German is physically better developed and more capable than the average Englishman or Welshman. Principal Reichel has made an inquiry by circular from the county schools in Wales, and finds that it is usual for physical exercise to simply mean an hour's drill once a week from the sergeant-instructor of the local volunteer corps. Useful as such exercise may be, Principal Reichel contends that it cannot be regarded as a means for developing on scientific principles the bodies of growing children. Such development must be provided for in the Welsh schools, if for no other reason than because it would powerfully react on the intellectual studies.

It is the proud boast of the Bethesda County School that it has not suffered loss of pupils on account of the Penrhyn strike. The number of pupils within the year 1901, as the headmaster reports, increased from 57 to 65 and then again to 73. The Inspector who visited the school reports: "A remarkable proof of the school's efficiency and attractiveness in the eyes of those who have the closest knowledge of it—the parents of the pupils—as

well as of the great value set on education in Wales, is that, though more than one-half of the parents of the pupils have been out of work for eight months, not a single pupil has been withdrawn from the school, and the number of pupils has actually increased." It was reported, further, that there are at present eight old pupils of the school at the University College at Bangor holding scholarships and exhibitions amounting to £167 a year. At the last July examinations for entrance scholarship into the Bethesda County School, for five scholarships there were 50 candidates from the elementary schools.

At Blaenau Festiniog County School it is announced that the numbers, during the year, have increased from 85 to 136. The average percentage of scholars from the elementary schools to the county schools throughout Wales is said to be 75. At Festiniog they number 86 per cent.

A CORRESPONDENT corrects our note of last month by assuring us that it was the Lord Bishop of S. Asaph, himself an old Warden of Llandoverly, who quoted the interesting passage "Buried in a Blue-book," of Mr. Williams, formerly second master at Llandoverly.

CURRENT HISTORY.

OF course, our readers have long ago read not only Lord Rosebery's Chesterfield speech, but what was said about it by all British and foreign newspapers, and what was said about those opinions, and so on *ad infinitum*, till the original speech has become quite ancient history. We note the speech as a whole only to point out the infallible mark of the rise of a new political party. Whenever the preacher of a new gospel disavows all party-ties and proclaims his creed as non-political, the world may be quite sure that a new political party is in process of formation. The Christian Church itself began as "not of this world," but the history of Europe cannot begin to be understood till the Holy Catholic Church is regarded as a State, not only claiming but enforcing the allegiance of men. And to come to our own times and nation, teetotalism, trade unionism, poor relief, provide us all with examples of the same generalisation. Every force "making for righteousness," every effort to improve the social condition, either ends in becoming political, and at least endeavouring, often succeeding, in ruling the world by the powers of the State, or it fades away and is counted among the "lights that failed." The whole question of "established churches" is explicable only by this formula.

Two clauses in Lord Rosebery's speech should be noted by the would-be future historian of our British constitution. The actual working of such a "thing of shreds and patches" as our Imperial Government can much better be studied in unconscious references and unwilling concessions than in formal textbooks, which have a tendency to justify and make the best of their hero, our "British freedom." We remark, therefore, that the Brito-Irish people are now quite helpless to control the government of their country. "For six or seven years" to come, our "utmost exertions are absolutely and hopelessly impotent to interfere with them in any way," and that in consequence of our "having endorsed and supported their action at the general election in October, 1900." And if the "people" are helpless, Parliament is not in much better case. "During the last session . . . no less than 76 per cent. of all the sums voted by Parliament were closed," and this "shows the ridiculous impotence to which Parliament has been reduced." Then who *does* govern this Empire? Should we be far wrong if we described our modern Constitution as "absolute monarchy tempered by periodical general elections"? As compared with "eastern" methods of ending "tyranny" (*e.g.*, Ehud's method

with Eglon, see "Book of Judges"), who gains most by our western civilisation, the governors or the governed? If the "Government were defeated," what would be the utmost penalty imposed on Lord Salisbury and Mr. Chamberlain?

LORD ROSEBERY "ventured to say that in the whole history of England, so far as he could recollect, there was no parallel to the hatred and the ill-will with which we are regarded almost unanimously by the peoples of Europe." That remark reminds us of the years 1763-83. "Peoples" are the new-birth of the last century, and Lord Rosebery says that European governments are not unfriendly to us. His statement is therefore literally true. But during the twenty years of the eighteenth century to which we have alluded we had scarce a friend in Europe. To Austria we had been a bullying, selfish and disastrous ally. France and Spain were our conquered and all-but humiliated foes. Prussia we had recently deserted, if not even betrayed to her enemies. And we had gained our ends. We had conquered America on the fields of Germany. Our situation in 1763 powerfully recalls that of Macbeth in the play. Banquo says:

Thou hast it now: King, Cawdor, Glamis, all
As the weird women promis'd; and, I fear,
Thou play'st most foully for't.

The king's conscience tells him:

That which should accompany old age,
As honour, love, obedience, troops of friends,
I must not look to have; but in their stead
Curses, not loud but deep.

And in 1780-1 we had our colonies in successful revolt, the Bourbon Powers wresting from us the supremacy of the sea, the Baltic States and even our old ally, "Holland," arming themselves against our maritime high-handedness. Our nearest "colony" was taking her first lesson in finding England's extremity Ireland's opportunity, and the partition of the British Empire grieved no one in Europe but ourselves.

RECENT HISTORICAL TALES.

WE received from Messrs. Blackie a parcel of their Christmas publications, but the demands upon our space have prevented an earlier notice. These are all boys' books; they are all historical tales in some sense of the term; and they all deal with comparatively recent history. They are printed, illustrated and bound in the style familiar to all who know the publishers' previous work in this field. There is one striking feature which several of the stories have in common, and that is the fact that the heroes combine a capacity for going safely through all manner of hair-breadth escapes with a pretty gift of the tongue. Mr. Henty's three heroes find their knowledge of "native languages" to stand them in good stead, and one of Captain Brereton's heroes finds his Russian uncommonly useful. The stories might also almost be written in collusion with consular reports to inculcate the lesson that the British man of the future must be able to use his tongue as well as his fists. This is by no means the only sound moral lurking in these books.

We will take the books, as usual, in chronological order.

(1) "At the Point of the Bayonet: a Tale of the Mahratta War." [1784-1805.] By G. A. HENTY. (384 pp.; 12 ill.) 6s.—Mr. Henty's hero was born towards the close of Hastings' career in India, and did many fine things in the time of Mornington's governor-generalship under both Wellesley and Lake. He it was who really anticipated Sir Stamford Raffles in acquiring Singapore for Great Britain. Mr. Henty is some-

what hard on the Maráthás, and he goes rather beyond the license allowable to an "improving" story-teller when he tries to make out that Lake's repulse from Bhartpur was equivalent to a victory.

(2) "In the Dictator's Grip: a Story of Adventure in the Pampas and Paraguay." [1805-1815.] By JOHN SAMSON. (288 pp.; 6 ill.) 3s. 6d.—The hero begins by being an ill-used English yokel and ends by being a prosperous estancia-owner in Buenos-Ayres; in the course of this development he comes into contact with Auchmughty, Beresford, and the egregious White-locke during the British occupation of the Plate district in 1806-7; he also meets the redoubtable Dr. Francia, the "Dictator" of the title. There are many allusions to the Jesuits' work in Paraguay, described in "A Vanished Arcadia," recently reviewed in these columns. The author is almost too prodigal in incident and in giving out his local knowledge; but his subject is one of exceptional interest and off the beaten track; and both his characters and his dialogue are life-like. We hope to hear more of South America from Mr. Samson.

(3) "To Herat and Cabul: a Story of the First Afghan War." [1837-1842.] By G. A. HENTY. (352 pp.; 8 ill.) 5s.—Mr. Henty's hero again takes a leading part in a notable series of events upon which one cannot look back with unmixed satisfaction. One does not get such a grip of the native mind as in the stories of Sydney Grier and Rudyard Kipling; but the externals and outward events are well enough portrayed. The publishers appear to think that this episode "has been neglected by writers of romance"; but there is at least one other tale about it by a writer almost as prolific as Mr. Henty.

(4) "A Gallant Grenadier: a Story of the Crimean War." [1854-5.] By Captain F. S. BRERETON. (352 pp.; 8 ill.) 5s.—The hero travels about with a menagerie and then enlists, receives a gold watch from Queen Victoria, and goes through the Crimean War, and discovers that he is a long-lost heir. Captain Brereton takes the old-time view of the Crimean War and the wickedness of Russia.

(5) "The Dragon of Peking: a Tale of the Boxer Revolt." [1900.] By Captain F. S. BRERETON. (352 pp.; 8 ill.) 5s.—Rather a straggling story of the outbreak in China and the siege of the Legations in Peking. The author seems to be under the impression that the presence of the European in China is an unmixed blessing for the inhabitants.

(6) "Carbineer and Scout: a Story of the Great Boer War." [1898-1900.] By E. HARCOURT BURRAGE. (240 pp.; 4 ill.) 2s. 6d.—The hero goes through the siege of Ladysmith, spends some time in prison at Pretoria, and finally settles down on a farm in Natal. He and a Boer chum agree in ascribing the blame of the war to "Kruger and his men," who "were only too ready to make the Jameson Raid a peg to hang their combative hat upon."

(7) "With Roberts to Pretoria." [1899-1900.] By G. A. HENTY. (384 pp.; 12 ill.) 6s.—We end as we began, with Mr. Henty, who in this volume practically supplements his last year's volume entitled, "With Buller in Natal, or a Born Leader." The hero takes part in Lord Methuen's battles, in the relief of Kimberley and Mafeking, in the fight at Paardeberg and in the capture of Pretoria. "Your knowledge of Dutch," General Pole-Carew tells him, "makes you a most valuable staff-officer."

SINCE the above notices were put in type two other books of a similar kind have come to hand. These new ones, however, are not fiction, but "true story-books," and as such they are certainly more attractive to the adult reader. Nor are they less interesting, it would seem, to the schoolboy; at any rate, the present writer has tried both groups on schoolboys of his acquaintance, and all alike have received the same expressive verdict of approval.

These two books are of a kind which the mere educationist must needs welcome more heartily than machine-made fiction, however excellent. It would suffice that a well-equipped school library should have only a selection of the above-named books; but both of those noticed below are essential. They are also admirably adapted for prize and reward books, and we should rejoice to see more of the same kind of book produced in the same artistic manner. Our two newcomers are these:—

(8) "Sea Fights and Adventures." Described by John Knox Laughton [xvi. + 294 pp.; 32 ill.; 2 maps; 5 plans]. (George Allen.) 6s. This volume contains thirty-one stories grouped under such alluring headings as "Spanish Treasure Ships," "The Spaniards in the Pacific," "Pirates and Buccaneers." To these stories is prefixed a careful introduction, tracing in outline the development of the Royal Navy in a regressive order, and explaining such mysteries as "32-pounders" and "carronades" in language intelligible to the most hardened landsman. It is really difficult to know which to praise most, the selection of the stories, or the way in which they are told, or the clever way in which the author appeals to the natural instincts and knowledge of the British schoolboy, or the abundance of well-executed illustrations (mostly reproduced from contemporary pictures) wherewith his stories are accompanied and really illustrated. As for the accuracy of the stories, Mr. Laughton's name is a far better guarantee than any anonymous assurance could be. The "tone" of the book is thoroughly healthy, and it is well worthy of its place alongside "The Open-Air Boy" (see the January issue of THE SCHOOL WORLD) in Mr. Dewar's "Young England Library."

(9) "Tales of the Spanish Main." By Mowbray Morris [xx. + 357 pp.; 8 ill.; 2 maps]. (Macmillan.) 6s. Mr. Morris is somewhat more "bookish," and he appeals, one fancies, to a somewhat older boy than Mr. Laughton does. For instance, in the one story which the two writers have in common—the story of the *Revenge*—Mr. Morris gives a brief but readable account of the various and conflicting authorities, and expresses himself much less decidedly than does Mr. Laughton. The comparison between the two ways of telling the story is highly interesting for those who can say, with Charles Lamb, "narrative teases me." Mr. Morris's stories deal with Columbus and the "Discovery of America," Balboa and the Great South Sea, Drake and "The Treasure of the World," "El Dorado," "In the Track of the Plate Fleets," and "The Brethren of the Coast" (especially Morgan). We notice that our two authors do not agree as to the meaning to be assigned to the phrase, "No peace beyond the Line." Besides being generally interesting to everybody, Mr. Morris's volume will be found practically useful by those who are preparing or being prepared for the new "Empire" subject prescribed for this year's Cambridge Local Examination; and we fancy that most people will agree with the present writer that the book bears reading more than once.

De Quincey's Confessions of an English Opium Eater. Edited by J. Downie, M.A. 333 pp. (A. & C. Black.) 3s. 6d.—This edition looks almost too sumptuous for school use. It is nevertheless admirably adapted for that purpose, and has been prepared with great care by one who evidently shares that regard for the largeness of De Quincey's understanding which no evidence of the shallowness of his character can utterly destroy. Mr. Downie's essay on De Quincey's style covers a lot of debatable ground in a very thoughtful, temperate manner, and as an estimate is singularly well worth consideration on literary grounds alone, though with great editorial modesty Mr. Downie pre-fixes Findlay's well-known critique to his own. Much valuable matter may be found in the appendix and notes.

RECENT SCHOOL BOOKS AND APPARATUS.

Classics.

Virgil, Aeneid V., by J. T. Phillipson (xxxix. + 103 pp.), and *Cicero de Amicitia*, by H. J. L. J. Massé (xlv. + 104 pp.), have been added to Bell's Illustrated Classics (1s. 6d. each). Mr. Phillipson's introduction is to the point; but his notes tell us that such a subjunctive is due to the dependent question, classify the conditional sentences, explain the ablative of attendant circumstances, place, instrument, and leave next to nothing for the pupil to do. The text is split up into sections, and each section summarised in English. The pictures are good. Mr. Massé has the strange idea that the chief value of Latin is to teach Latin prose style (*Preface*). His introduction is good, pictures excellent; the notes, as usual, full of translation (e.g., *domi, pauci admodum, is qui, haud scio an*, and similar trifles); he also makes an adverb qualify. From the teacher's point of view, neither book is well edited; moreover, the print tries the eyes.

Mr. E. C. Marchant's *Κλίμαξ Πρώτη, a First Greek Reader* (Bell, 1s. 6d., 72 pp.), with hints and vocabulary, is good. It is simply expressed and interesting, and the pace is fairly quick, so that the latter part is continuous narrative. Luckily there are few notes. The Greek is correct: we need only point out that *φοιτᾶν* is properly used of frequent visits. The pictures are good, except an extraordinary soldier on p. 4, who combines the late Mycenaean with classic order.

Mr. E. Ensor's *Metamorphoses of Ovid*, Book I. (Blackie's Illustrated Latin Series, 1s. 6d.), xviii. + 105 pp., is provided with a vocabulary and a number of notes—some very elementary. There is far too much translation: the boy is told how to translate *deduco, haec super, effervescere, tamen, multo sanguine*, and many other simple things; the quantity of *cānebat* is given as well as the translation (110). What is left for the pupil? Further, it is a blunder in taste to quote Kipling as an English poet, which is here done more than once; Mr. Lang seems to be the editor's ideal in prose (p. xiii.). The pictures are good.

Caesar's Gallic War. Book II. By John Brown, M.A. xlvi. + 116 pp. (Blackie.) 1s. 6d.—This is a new edition of a book which has made its mark and seems likely to maintain its place as a favourite for class work. The new illustrations include several full page pictures of incidents described, and there is a really fine photographic representation of a sacrifice.

The House of Atreus: being the Agamemnon, Libation-bearers, and Furies of Aeschylus. Translated into English verse by E. D. A. Morshead, M.A. (Macmillan: Golden Treasury Series.) 2s. 6d. net.—Mr. Morshead's translation has been before the public now twenty years, and has taken its place as the best English version of Aeschylus. A new edition, in cheap and convenient form, will be welcomed. The translator has not made any serious alterations; he has corrected a few errors, and improved in a few details by criticism, but the form of the original version is unchanged. There is no doubt that further improvement is possible; if, for example, the chorus parts of the "Agamemnon" were rendered with more freedom of rhythm, and less of the quatrain. But Mr. Morshead has declined the attempt, perhaps wisely. Yet, in spite of this and other criticisms, we add our tribute of praise to the strength and dignity as well as the accuracy of this excellent translation.

Too many notes, too much spoon-meat, is our verdict on the editions of *Virgil, Georgics I.*, by Mr. J. Sergeant, 76 pp. (Blackwood's Classical Text), 1s. 6d., and *Aeneid II.*, by Mr.

M. T. Tatham, 128 pp., with Vocabulary (Arnold), 1s. 6d. Mr. Sergeant's "Georgic" has a good introduction well written, and an appendix containing (1) passages from Hesiod, with translations, and (2) the Flora, to use scientific jargon. He says rightly that more work is to be done on the last matter; we wish he would do it thoroughly, in a monograph, which teachers might study and use as they found convenient. The notes are quite good, and are not so numerous as in some school-books.

Mr. Tatham prefixes a translation of Suetonius's "Life of Virgil," which is good, and a short treatise on the language of the Aeneid, which we think is so much wasted labour in a school book. Part of it is very elementary; and on a reasonable system of training, boys ought not to come to Virgil until they are prepared to tackle such things. The notes are 42 pp. of small print, the text 24 pp. of large print; there is far too much translation and grammatical help, quite satisfactory in itself, but out of place here. A vocabulary is also out of place when the pupil comes to Virgil.

A Few Notes on Julian, and a translation of his public letters. By E. J. Chinnock, LL.D., late Rector of Dumsries Academy. 82 pp. (Nutt.) 1s. 6d. net.—There are signs of a renewed interest in this strange and pathetic figure of Julian, the honest apostate, whose apostasy has so long obscured his ability. Dr. Chinnock's leaflet is not an estimate of the emperor's character of mind, but it will help those who wish to understand him. The "Notes" contain illustrations of Julian's language, some features of which are traced to their source; and conjectural emendations, or brief discussions of them. Some of the latter are convincing, as *ιερατελαρ* for *ιαρτελαρ*, p. 391, line 12, of Hirtlein's text; but Dr. Chinnock should state his grounds more fully. Here, for example, *ιερεων* below makes the conjecture a practical certainty. *Πανδαρεύω*, p. 74, line 19, and *ποταμου*, p. 543, line 10, are recommended by known facts; but *καλ* for *ου*, p. 136, line 4, is only a guess, at least no explanation of the mistake is suggested. The translations are accurate and idiomatic.

A Hebrew Grammar. By A. Duff. 80 pp. (Black.) 2s. 6d.—The author of this manual declares it to be for students and ministers, and it represents a printed version of hand-written notes he has been giving to members of his various classes for a great number of years. As a person of strong convictions, Dr. Duff declares against teaching Hebrew by talking about declensions in the nouns and against the Ollendorf method, and so in the brief space of eighty pages he has put together a most concise but comprehensive scheme of the language. It is true that at times he strikes one as developing his private views to the point of absolute idiosyncrasy, but the volume is useful, and puts much matter in a little room. The idea of royal roads to Hebrew is, however, as subject to disillusion as most other ideas of the same kind, but anything that helps to mitigate difficulties in grammar honestly is of immense service.

Edited Books.

Handbook to St. Luke. By the Rev. M. Stevenson. 264 pp. (Rivingtons.) 2s. 6d.—This volume follows the general plan of previous editions in the useful series known as "Rivingtons' Handbooks to the Bible and Prayer Book." It is a volume for teachers, and will be found more especially serviceable to those engaged in elementary education, because the blackboard sketches which diversify the volume are of an extremely serviceable nature. The aim of this particular version of St. Luke appears to be most eminently that of utility; hence the introduction is brief, but the notes are voluminous. Every point worth noticing appears to be illustrated by them. To pupil-teachers whose time is limited this book will be invaluable,

though the latter class especially need to be on their guard against a loose use of it as a mere cram book.

Boys and Girls of Other Days. By John Finnemore. Series II. 215 pp. (Black.) 1s. 4d.—A few months ago we noticed a preceding volume bearing this title. In this, its successor, Mr. Finnemore continues the same useful plan he then pursued, and continues to illustrate English history from the rising of Lambert Simnel to the Battle of Sedgemoor. As a reading-book this volume ought to prove very useful, as the style is quite within the grasp and comprehension of very immature minds. But it is incorrect to claim for it the title of "romance" as has been done in some quarters. It is a school reading-book, and very interesting and comparatively easy of mastery; a genuine success in its own line, which is, however, nowhere near that of the genuine work of fiction or of imagination. These distinctions appear to be most difficult to establish in pedagogic minds.

Scott's Talisman. Abridged for Schools. 246 pp. (Macmillan.) 1s. 6d.—Remembering certain recent editions of Scott's novels which we have already characterised as literary tabloids, it is only fair to say that this version of "The Talisman" is free from all the objectionable features of those works. Indeed, it is a model of the commonsense breadth which ought to mark a good abridgment, and abridgments are inevitable in the case of adapting a somewhat voluminous author like Scott to purposes of school work. The introduction to this work consists of nothing more than three fairly extended notes on the *dramatis personæ*, the Crusades, and on Chivalry, while the notes proper are plentiful, but exceedingly brief. It will form a most useful reading-book for junior forms.

Macbeth. Edited by A. W. Verity. 288 pp. Shakespearean Schools. (Cambridge University Press.) 1s. 6d.—Mr. Verity's editions of Shakespeare in this well-known series are always on such a high level that it would be difficult to surpass their general excellence in any particular instance. "Macbeth," however, strikes us, if the thing be possible at all, as reaching a higher point than any previous play, or perhaps as exhibiting the common features of this edition in such a remarkable degree as to entitle it to the highest consideration. Although Mr. Verity modestly notes his debt to Dr. Furness, it is quite obvious that, whatever matter he may have based on Dr. Furness's edition, the amount of original work which he has supplied on his own account is of the greatest importance, and entitles him to be regarded as an almost ideal editor of Shakespeare for school purposes. Mr. Verity's introduction of forty-eight pages is crammed full of information ranging over an extensive field, and if erring in anything, only in sacrificing some of the graces of style to depth of learning. To read it is decidedly task work, but the result is an extended knowledge of the subject-matter out of all proportion to the trouble taken. The notes are just what we now are accustomed to expect in this edition, and the glossary is very full. To these are appended a long series of extracts from Holinshed which illustrate the play, and then in addition there is an appendix in several sections (one of the most interesting of which deals with the supernatural element in "Macbeth," and two others of an æsthetic type with dramatic irony and dramatic relief), and, to conclude, a number of valuable hints on metre and on Shakespeare's use of rhyme. These indications show the range covered by this edition. To satisfy oneself of its completeness it is only necessary to read it. It is an edition almost beyond praise.

The Middle Temple Reader. Edited by E. E. Speight. 250 pp. (Horace Marshall.) 1s. 6d. net.—The editor of this reading book has taken unusual pains to make his compilation

of the very widest and most catholic character. It is in prose and verse, and a reader roams at pleasure from Chapman's Homer and the Egil's Saga down to Thomas Love Peacock and Joaquin Miller; from Froissart to Walt Whitman, for whom Mr. Speight seems to cherish an affection. The illustrations might be better done, although the price of the volume is trifling. They are most suggestively lurid. Sir Launcelot, for instance, is a study in crudities, and Walt Whitman's "Pioneers" would not advance progress very considerably.

English.

The Teacher's Manual of Composition. By Robert S. Wood. Volume I.: Junior Course. (For Infants and Standards I. and II.) 154 pp. (Macmillan.) 1s. 6d.—In his "Word-building and Composition," Mr. Wood has already done a valuable service for teachers of English composition. In this new series great stress is rightly laid upon oral composition as the starting point in the lower standards: many excellent exercises are provided for this purpose. Blank pages are left, on which the teacher may record original "experiments" at each step. The book may profitably be used alone or in conjunction with the corresponding parts of "Word-building and Composition."

History.

A General History for Colleges and High Schools. By P. V. N. Myers. x+759 pp.; 31 maps; 145 ill. (Ginn.) 6s. 6d.—This is a handsome volume, well printed on good thin paper, admirably equipped with illustrations and maps (mostly taken from Freeman's "Historical Geography"), and bound in half morocco. The text is clear, readable, and well proportioned (bisecting at A.D. 476), and it attains a high level of accuracy. Altogether, the book strikes us as by far the fullest and cheapest single-volume manual of "General History" with which we are yet acquainted; and, but for the fact that it rather scamps the nineteenth century, and, despite the date on the title-page (1901), stops short at 1889, we should without qualification recommend it as the most suitable book for the general reader. But as there is no guidance in further reading and no teaching apparatus, we still remain faithful to Prof. G. B. Adams's dearer and smaller book as the best book for the student and teacher. Mr. Myers's larger work on "Mediaeval and Modern History" is said to have these biographical and other appliances; and we greatly regret that the present volume has not been equipped with these things—without which no historical text-book can deserve unqualified approval.

A History of Modern Europe from the Fall of Constantinople. By T. H. Dyer. Third edition, revised and continued to the end of the 19th century by A. Hassall. Vols. I.-IV. (1453-1789). Pp. xvii. + 470; xiv. + 481; xiv. + 463; xiii. + 467. (Bell.) 6s. each.—Dr. Dyer's "History of Modern Europe" reached a second edition in 1877, when the author revised his work and brought the story of Europe down to 1871. Mr. Hassall has now given us a third edition. In his preface he says that "a remarkable advance has been made in our knowledge," "an enormous mass of new material . . . has appeared." He has, therefore, "revised the whole of Dr. Dyer's history," and has "embodied the results of modern research." We have pretty carefully gone through the four volumes of this new edition (two more are promised), comparing them with the corresponding parts of Dr. Dyer's second edition, and the result is curious and interesting. Mr. Hassall is not consistent in his principles of revision, but so far as our observation has gone, "the results of modern research" are to omit picturesque epithets and anecdotes, whether true or discredited, and especially all reference to the sexual immoralities of kings and

princes. Almost the only serious changes in the text that we have discovered are in the chapters on the first half of the 18th century, but the history of the international revolution of 1755-6 is left practically as Dr. Dyer wrote it, and there is no sign that Mr. Hassall has even heard of Schaefer, von Arneth, Vitzthum, Beer, Broglie, or of the publication of Frederick the Great's Correspondence, which, together, have, within the last thirty years, caused an "enormous mass of material to appear" wherewith to revise our ideas of European history in the time of Frederick the Great, including the wars of the Austrian Succession, the Seven Years' War, and the partition of Poland. We have found one or two instances of careless editing. Specially curious is that which occurs in the first volume (pp. 258-260). Mr. Hassall rejects the story of the poisoning of Alexander VI., but leaves not only Dr. Dyer's now meaningless note as it stood, but also his statement in the next chapter that Cæsar Borgia was "still suffering from the effects of the poison," in which Mr. Hassall does not believe and which, therefore, he has not mentioned. But we must not give our readers too unfavourable an impression of this book. Dr. Dyer's is a well-written work, and Mr. Hassall's changes, so far as they have gone, would perhaps be approved of by many. He has changed it not only in style but also in form from a "library" to a "student's" work, and has given us a map for each volume. He tells us that the "new material" "bears especially on the Napoleonic period," and we must therefore wait for the appearance of the two volumes still promised to see what he will do with the period 1789-1871, which Dr. Dyer wrote, and with the following years that are to be entirely new.

Macmillan's New History Readers. Book II. (Intermediate.) vii. + 244 pp. 1s. 6d.—This book is intended to follow on the little book with a similar title which we noticed in September last. It is a really amazing little work. In its two hundred and fifty pages, many of which are devoted to good illustrations, it not only passes from pre-historic times to the reign of Edward



Seal of Simon de Montfort.

VII., but has leisure to picture for us the dying moments of Bede, the battle of Hastings, and other famous incidents. This wonderful result is effected by the judicious omission of whole chapters of our history. Constitutional events are not. The reigns of the Georges, for example, are almost entirely ignored. And the result is an excellent little reader in which the only fault we find is an "Emperor of Germany." We reproduce one of the illustrations.

Geography.

Commercial Geography of Foreign Nations. By F. C. Boon, B.A. viii. + 174 pp. (Methuen.) 2s.—On the whole, we cannot recommend this book. Recognising the importance of a knowledge of climatological and topographical conditions as the basis for a proper understanding of commercial activities, Mr. Boon first gives us seven pages dealing with these conditions and then proceeds to exemplify them in the case of all the countries in the world (except the British Empire). The plan is scientific in its conception, but in its execution is somewhat weak. Indeed, the chief impression we have obtained from a careful perusal of the book is that the author has been unduly hasty in "rushing into print." The frequent references to forests, &c., as *attracting* moisture, have a misleading tendency, and (p. 109) the Atlas mountains certainly do *not* condense moisture. Our impression is intensified by the occurrence of several typographical errors, and by the author's loose (and, in places, actually ungrammatical) style.

A Geography of Wales. By A. E. L. Hudson, B.A. vii. + 164 pp. (Macmillan.) 1s. 6d.—This book is intended to cover the requirements of the Syllabus in Stage I. of the Central Welsh Board. Of the twenty-five chapters which it contains, six are concerned with the natural conditions and productions of the land; the remaining chapters show the relations that consequently obtain between the inhabitants of the several counties and their environment. The inclusion of several maps and a large number of illustrations renders the book peculiarly suitable for the attainment of its object.

Mathematics.

A Treatise on Elementary Statics. By W. J. Dobbs, M.A. xii. + 312 pp. (Black.) 7s. 6d.—This book will no doubt find a welcome from those who still favour a complete course of statics before dynamics is begun. Its principal merit is the attention paid to graphical methods, including the force-diagram and funicular polygon; in other respects it seems of a rather academic type, especially in the examples, which are very numerous, and constantly suggest University Entrance Scholarship papers. Mr. Dobbs's diagram of a machine on p. 207 is calculated to raise a smile on the face of a practical engineer.

Algebraical Examples. By H. S. Hall, M.A. viii. + 172 pp. (Macmillan.) 2s.—A useful supplement to Hall and Knight's "Elementary Algebra." There are 105 sets of classified examples, and five groups of test papers. Certain kinds of typical examples have been worked out in full.

Algebra. Part I. Adapted to the requirements of the First Stage of the Directory of the Board of Education. By E. M. Langley, M.A., and S. R. N. Bradley, M.A. xii + 192 pp. (Murray.) 1s. 6d.—This is a really excellent class-book, and is sure to be a success. The analogy between arithmetic and algebra is duly emphasised, the worked-out examples are good models of manipulation, and the unsolved exercises are both numerous and unobjectionable. The discussion of theory is reduced to a minimum, and its inculcation is mainly left to the teacher, who is very properly advised to read De Morgan as well as C. Smith and Chrystal. Of course a book of this kind may be wrongly used, but if it is, it will not be the fault of the authors. The book is well printed, and with its neat and artistic cover presents a very attractive appearance.

The Elements of Euclid. Book XI. By R. Lachlan, Sc.D. pp. 491—542. (Arnold.) 1s.—This forms the last instalment of Dr. Lachlan's School Euclid, and comprises propositions 1-21,

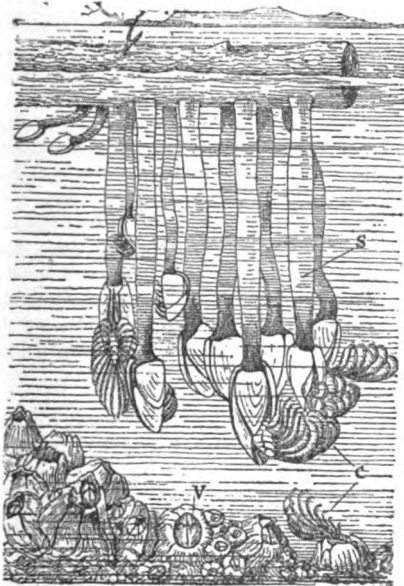
with easy exercises; an appendix of 16 pages on points at infinity, projection, properties of a tetrahedron, properties of a sphere; and a set of fifty miscellaneous exercises. Euclid's proofs have been simplified and condensed or replaced by others; it seems likely that his propositions will, in this form, prove less unpalatable to the student than is usually the case.

The First Book of Euclid, with Exercises. 1+40 pp. (Blackie.) 2d.—A conservative text, arranged in paragraphs, and without abbreviations. This is followed by 89 exercises, very well selected and arranged. The figures are good, and the print clear.

A First Arithmetic. By W. T. Knight. vi. + 84 pp. (Relfe Bros.) 8d.—A useful collection of easy examples, with a few rules and definitions interpolated.

Science and Technology.

Life and her Children. By Arabella B. Buckley (Mrs. Fisher). xii. + 312 pp. (Edward Stanford.) 6s. Eighteenth thousand.—Mrs. Fisher is in the front rank of writers upon popular natural history, and this book gives "Glimpses of Animal Life from the Amoeba to the Insects" in a style which is eminently attractive. Scientific names are in general relegated to footnotes, and the animals are referred to in the text in less formidable terms. We have, as instances, "slime animals" for protozoa; "lasso-throwers" for the coelenterata;



Floating and Acorn-Barnacles.

and "mailed warriors of the sea" for marine crustacea. The leading features of the various great groups are boldly sketched, and are illustrated by interesting descriptions of the habits and structure of selected examples. Two plates and about a hundred woodcuts, one of which is here reproduced, usefully elucidate the text. The calcareous shells of molluscs, &c., are repeatedly referred to as consisting of "lime." The retention of the Linnæan "insects" for all arthropods is also unfortunate. With these exceptions, we have nothing but praise for the book. It will be greatly appreciated by all young biologists.

History of Geology and Palaeontology to the End of the Nineteenth Century. By Karl Alfred Von Zittel. Translated by Maria M. Ogilvie-Gordon, Ph.D., D.Sc. xvi. + 562 pp.

(Scott.) 6s.—Mrs. Dr. Gordon has conferred a great benefit upon students of geology in this country by translating Prof. Zittel's admirable history of geological science. Added to a perfect familiarity with the present state of this fascinating science, Mrs. Gordon evidently possesses an easy command of German, the consequence being that we now have for the use of English students a version of the work of the distinguished Munich geologist written in pleasing language and free from the vexatious ambiguities which mar so many translations published in this country. The first characteristic of Prof. Zittel's book which will impress the student is its commendable freedom from partisanship; the author no sooner takes up his pen than he forgets his nationality, remembering only that he is a man of science. Honour is given where honour is due, and there is no desire to exalt unduly any country. To Prof. Zittel, as to British geologists, Hutton is "the great founder of physical and dynamical geology"; Sorby's memoir in 1860 "revolutionised the teaching of petrography"; Lyell's leading principle—"that the key to the solution of the events of the past is to be found in the study of the natural forces still acting—has remained as the secure basis of all modern geological investigation." And the same generous appreciation is shown for the work of geologists of every country. Prof. Zittel practises that broad charity which we all admire, but which so few of us do more than preach. It will, too, we believe, come as a pleasant surprise to many students that what we are apt to regard as the commonplaces of geology really represent some great advance due to the quiet work of geologists who have long since passed over to the great majority. For example, the erratics on Alpine slopes had long been observed by geologists and an explanation vainly sought until Playfair realised that they might have been carried to their present position by former glaciers. That rivers erode their valleys and deposit pebbles on valley terraces, that fine detritus accumulates at river mouths, and plants and animals are buried in it to become later transformed by slow molecular interchange into fossils, are now truisms even to the third-form boy, yet it was not until Leonardo da Vinci brought the trained observation of the artist to bear on natural phenomena that these truths were recognised by humanity. So it is throughout this interesting book, an abundance of information is presented in so attractive a guise that the lay reader may well approach it in the hope of being pleased as well as instructed. The volume should be added to every school library.

Elementary Inorganic Chemistry. By James Walker, D.Sc., F.R.S. iv. + 265 pp. (Bell.) 3s. 6d.—Prof. Walker has written this book for students who, having been introduced to chemical science at school by what is known as the heuristic method, find themselves at college for the purpose of continuing the subject as a part of a course in science or medicine. The only test that will decide its suitability for such students is that of actual trial; certainly, the book is not suitable for ordinary school-work. No instructions are given for the performance of experiments; the general principles of the science alone receive extended treatment. Of course, Prof. Walker's name is guarantee enough that the information is correct and in accordance with modern theory, but we cannot help thinking the volume might have been made more attractive and useful for young pupils with the help of more numerous illustrations and by the addition of exercises to encourage the self-activity of the learner. If we may trust our own experience, we should say that the ordinary youth will become impatient of the general subjects treated in the first half of the book and will be tempted to jump to p. 122, where the systematic description of particular chemical substances begins. Prof. Walker seems to proceed from the general to the particular; the reverse order is, perhaps, more suited to young

persons. Like other books of the same publishers, this one is clearly printed and well produced.

Practical Exercises in Sound, Light and Heat. By Joseph S. Dexter, B.Sc. (Lond.). 281 pp. (Longmans.) 2s. 6d.—This book is intended for the use of students during the first two years of the elementary course of organised schools of science, university students, students in evening continuation schools, and others. The first section, dealing with Heat, consists of 87 exercises, and is followed by 91 exercises on Light and 39 on Sound. As a general rule, the apparatus required is simple; but, in some cases, the author suggests the use of a lantern, an optical bench, a thermopile, and a spectrometer—appliances which are not always at the disposal of students. Several exercises on Light and Sound are purely geometrical, and will be found very useful in helping experimental work. Also, many of the exercises are preceded by a short theoretical explanation of the experiment sufficient to enable the student to carry out the practical portion in an intelligent manner.

Elementary Chemical Theory. By G. H. Martin, M.A. 24 pp. (Rivingtons.) 9d.—We cannot recommend the use of what may be called "tabloids of science." Mr. Martin has collected twenty pages of the definitions of chemical science and attached an index. The boy in whose hands the pamphlet was placed would proceed to learn its contents by heart and imagine he was acquiring some knowledge of chemistry, whereas he would be merely exercising his verbal memory. "Before teaching any doctrine, wait until the nature of the evidence for it can be understood," said the late Prof. Clifford. At this stage no boy would be satisfied with Mr. Martin's dogmatic assertions.

An Elementary Physics for Secondary Schools. By C. B. Thwing, Ph.D. xii. + 371 pp. (American School and College Text-book Agency.) 5s.—There may be, as the author of this book says in his preface, a demand for a "new school physics" in American schools, but we are of opinion that such is not the case on this side of the water. Even if it were, this book would scarcely supply the want. Judging from the syllabuses of the examinations for which most of our secondary schools prepare, it is clear that British boys are expected to have a more intimate acquaintance of one or two branches of physics rather than a superficial knowledge of the whole science such as this book provides. For example, the science of heat, from a theoretical point of view, is disposed of in twenty pages, while the practical exercises on the same subject cover but ten more. The price of the volume is too high for a school book.

Hygiene for Students. By Edward F. Willoughby, M.D. Lond. xx. + 563 pp. (Macmillan.) 4s. 6d.—This book contains a large mass of information, but it is so presented that few "advanced" students will find it dull. The laws of health are discussed in their bearing on the individual, the household, the city and the race in succession—an eminently logical order of treatment. The chapter on Vital Statistics—a subject upon which the average man's ideas are almost as nebulous as his notions of bimetallicism—will also be found very useful. While the book does not specially follow any particular examination syllabus, it may be confidently recommended not only to students but also to the general reader. A pleasantly personal, not to say dogmatic, note runs through it and adds largely to its interest. At the end of each chapter is a useful summary and a series of questions, many of which are taken from past examination papers of the Board of Education. We hope that in future editions the printing of the chemical formulæ will be rendered uniform. "H²SO⁴" savours more of algebra than of chemistry.

Miscellaneous.

The Public Schools Year-Book, 1902. Founded by three Public School Men, Eton, Harrow, Winchester. 515 pp. (Swan Sonnenschein.) 2s. 6d.—The thirteenth issue of the Public Schools Year-Book does not differ much from that of last year. The editors have limited the right of insertion, with a few exceptions, to such schools as are connected with the Headmasters' Conference. As usual, the changes which have taken place in the headmasterships of the public schools are duly noted. The book should be in the possession of every public schoolmaster; it is as necessary to him as the "Clergy List" is to the clergyman, or the "Medical Directory" to the doctor.

In *Cardboard Modelling for Boys and Girls* (Blackie), 6d. net, Mr. A. W. Bevis, head organiser for Manual Training and Drawing to the Commissioners of National Education, Ireland, gives twenty-five ingenious examples of cardboard models with careful working drawings showing exactly how they are to be carried out. This little book should afford very instructive amusement for children, but it is rather a pity that some of the copies are not better in form. The accompanying *Drawing Book for Hand and Eye Training* (same publishers), price 3d. net, provides paper divided into dotted squares for drawing out the models full-size.

Brush-work and Design. By Frank Steeley (late Steeley and Trotman, authors of Bacon's Excelsior Drawing Publications). (Bacon.) Parts I., II., and III. 1s. 6d. each.—These three books, each of which contains ten coloured plates of brushwork exercises together with descriptive letterpress, are intended to provide a complete course of brush-work instruction from the infant school to the highest standards of the elementary school. The examples progress by easy stages from the simplest dabs produced by laying the brush on the paper at different angles, with which the first part opens, to the fairly simple all-over repeating patterns which bring the second part to a close; but Part III. seems a good deal more difficult than its forerunners. The examples are not by any means of equal merit, and the colours in which they are printed and the way the designs are arranged on the sheet are not pleasing to the eye; but a judicious teacher should be able to find here plenty of material for interesting lessons.

The Wonderful Century Reader. By Alfred Russel Wallace. viii. + 234 pp. 127 illustrations. (Swan Sonnenschein.) 2s.—This very attractive little volume is an abridgment of the author's now well-known book "The Wonderful Century" published three years ago. It is intended for use as a reading-book in schools throughout the English-speaking world. Unfortunately, the nature of the subject has necessitated the use of so many technical expressions that the language will prove beyond the comprehension of children under fifteen years of age, and at this period of school life the use of a reading-book is not common. As supplying much of the information demanded in General Knowledge papers in secondary schools several copies of the book might suitably find places in the school library. Under another title, for the present suggests the class room too vividly, the book would form an excellent gift for intelligent boys and girls of higher forms. Whatever may be said of the text, it is quite certain that the pictures, which are admirably executed, will please children of all ages.

Better Food for Boys. By Eustace Miles, M.A. viii. + 86 pp. (Bell.) 1s. net.—Whatever assists the improvement of the moral tone of our schools is worthy of encouragement. Mr. Miles maintains that the prevalence of impurity among boys is

largely the outcome of the present stimulating diet with which they are provided. He advocates the substitution of one of the many forms of fleshless diet in place of the common meat régime. The author's eminence as an athlete and scholar should go a long way to recommend the food he has himself found beneficial. Parents and schoolmasters will do well to study carefully his judicious advocacy of a diét, "which, while it may develop body and mind to the highest and most varied activity, shall yet be free from the disadvantages of over-stimulation."

Sermons preached in Sedbergh School Chapel, 1883-1900. By H. G. Hart, M.A. viii.+234 pp. (Rivingtons.) 3s. 6d.—The language of these sermons is simple, direct, and often impressive. The subjects selected for treatment are generally of a practical kind, and their connection with the affairs of school life is sufficiently obvious to the minds of boys. "What to read, and How," "Friendship," "Discipline," are the titles of three of the addresses, and they may be taken as typical. We recommend those of our readers whose duty it is to speak to boys in the school chapel to read this volume; it will not only provide inspiration, but teach the art of saying what is necessary without polysyllabic expressions.

The Regulations for Evening Schools, 1901-2. Edited by Herbert Cornish. (Grant.) 1s.—The present issue of the *School Board Chronicle* edition of the Regulations for Evening Schools maintains the high character for usefulness which we have remarked in previous years. No manager or teacher of an evening school can afford to be without it.

How to Remember without Memory Systems or with Them. By Eustace H. Miles. 278 pp. (Warne.) 2s. 6d.—This is a sensible little book on the practical side of memory. In its theoretical psychology it is not very searching, but from the view of common-sense, practical rules, it is both interesting and valuable. There is considerable acuteness in the reference to what may be called the psychology of advertising, and undoubtedly something can be gained for memory method by considering wherein lies the success of advertising in impressing the memory. The salient points of different memory-systems are given, and helps to memory described, and a helpful list of references given. It should be added that the examples and illustrations given make the book interesting reading.

Thoughts in the Cloister and the Crowd and Companions of my Solitude. By Sir Arthur Helps. (Dent.)—This beautiful edition of two widely popular works is the latest addition to Messrs. J. M. Dent's "Cloister Library." We can highly recommend the edition.

CORRESPONDENCE.

The Editors do not hold themselves responsible for the opinions expressed in letters which appear in these columns. As a rule, a letter criticising any article or review printed in THE SCHOOL WORLD will be submitted to the contributor before publication, so that the criticism and reply may appear together.

The School Training of Medical Students.

THE Memorial to the General Medical Council, dated "Glasgow, November, 1901" (see p. 67), bears an imposing list of signatures, and in their protest against all superficial scientific teaching for the future medical student all who know what is required in these days will most cordially agree. It is unquestionable that "a knowledge of scientific principles" is a

necessity, and that when the proper time arrives—which is not at any fixed age for all boys—"the student should devote his whole energy to the subjects in question." Further, all teachers will probably agree in thinking that scientific teaching given to young boys is of little educational value, especially if given to the detriment of more general subjects, and that "the power of grasping scientific generalisations is seldom developed till a later stage than that at which the Preliminary Examination "can be passed."

But when is this proper time, and where can the principles of science be best taught? and when *should*—I have replaced this word in quoting the Memorial by "*can*"—the Preliminary Examination be passed? For if it be passed quite early in a boy's school life, before he is fit to proceed to his scientific studies, how is he to be employed in the interim? On these points I venture to think the Memorial indistinct, and its language calculated to do grave injustice to many secondary schools, where pupils properly remain till the age of eighteen, or even nineteen.

The Memorial pleads that "no graver mistake could be made than the relegation of these (science) subjects to the school period." I venture most emphatically to disagree, and I speak from an experience of thirteen years, during which I have trained many boys out of a school of 240 with success for the London Preliminary Scientific Examination for the degrees of M.B. and B.Sc., and for the Intermediate B.Sc. and other examinations. Many of these boys are now on the staff of various London hospitals or occupying responsible positions in them or in other institutions.

I believe a good general education in the ordinary school subjects, especially classics and mathematics, to be the best foundation in early years. The Preliminary Examination should insist on this, and should not be passed before the age of sixteen. Some boys develop late, and may not pass it till nearly seventeen. It is a grave mistake to remove a boy at this age and at this stage from proper school discipline and from the teaching of those who know his work and powers. Now is the time for him to specialise for his medical career. He should devote his whole time, or most of it, to the careful study of scientific subjects, and do plenty of practical work in the laboratory. In a period varying, according to capacity, from one to two years, he will acquire much sound scientific knowledge, and be fitted at eighteen or over to proceed to the hospital, and enter at once on his more strictly medical studies. This is the sort of course through which I find boys pass with most success. The details, no doubt, would vary in different schools, according to the aims of the school and the ability of each boy. I only wish to point out that a scientific training of a thorough character is best given at school, and I am sure boys do best who receive it at any school properly equipped for the purpose. Boys who have reached the necessary standard must begin to study what they will specially require; for the medical profession, after a given point is reached, science is the first requisite. But to remove boys too early from school life, and turn them into immature undergraduates, would be a graver mistake than that feared by the memorialists, and ignores the efforts made by many recognised institutions to give a sound scientific training.

T. N. HART SMITH.

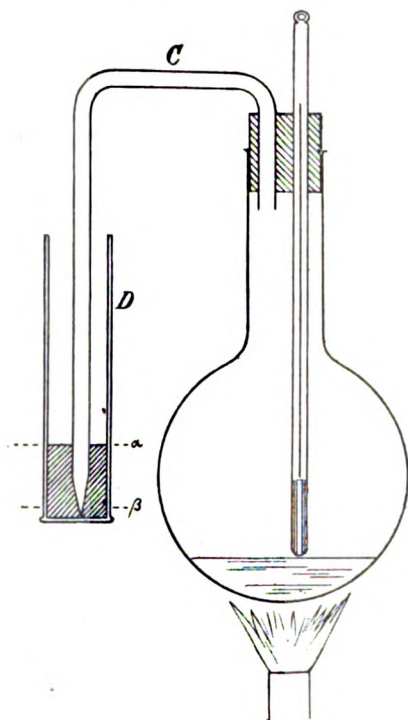
Epsom College.

The Effect of Change of Pressure on the Boiling Point of Water.

SEVERAL simple experiments to prove the effect of reduced pressure on the boiling point of water are described in various elementary text-books; but an experiment to show the effect of

increased pressure is seldom mentioned; and, if it is, the student is perhaps told to partially close the steam exit—a dangerous procedure in inexperienced hands. The experiment described below is, I believe, novel; and it has the advantage of indicating not only the effect of both increased and reduced pressure, but also of affording approximate quantitative results.

The glass tube, *c*, through which the steam passes from the water boiling in the flask, is bent twice at right angles, tapered slightly at the lower end, and cut off in a slanting direction. *D* is a narrow glass cylinder into which mercury may be poured, whereby the pressure is increased when steam is escaping through the mercury. The total pressure may be determined by adding



the difference of level between *a* and *b* to the height of the barometer. The flame should be adjusted so that steam is only just escaping through the mercury.

The pressure may now be made less than atmospheric by turning the gas down very low (or it may be turned out altogether). The mercury will soon commence to rise up the tube *c*, thus causing a diminished pressure, but the water will continue to boil. The actual pressure at any instant is obtained by subtracting the difference of level of the mercury inside and outside the tube from the height of the barometer. By adjusting the flame, the diminished pressure may be kept practically constant. If the outer tube of *c* is 20 cms. long, water may be made to boil at any temperature between 95° C. and 105° C.

H. E. HADLEY.

Kidderminster.

Geography in the Cambridge Locals.

I WISH to know whether the first question in the recent Cambridge Local Preliminary Paper in Geography is in agreement with modern ideas. One part reads, "Name the three

counties marked by a cross"—the three counties being inland counties.

I just wish to know if I am wrong in supposing this to be bad, because it will be much easier for me to drill my children to pick out the counties like a puzzle than to get them to understand the "whys" of many geographical facts. We have, I hope, passed the time when strings of words were committed to memory from a book and pupils fondly imagined they were learning geography: we have come to see that a map is more of a necessity than a book. The old mistake was that pupils learned nothing in actual fact to correspond to the names: the question I enquire about seems to have the same fault. The counties of England may be very easily learned from a map, as strings of words from a book, as a mental exercise, but when they are learned, the advance in knowledge is, I think, almost altogether imaginary. I doubt very much whether ninety-nine children out of a hundred know the nearest boundary line between their own county and the next—the actual boundary line in the land, that is. Maritime counties have of course a very obvious limit on their seaward side, and there may be some use in having a knowledge of their positions, but with inland counties it is different. Very often the division line is to be seen only on a map: in this district the line between Middlesex and Hertford, within a hundred yards of a school, passes through a grass field.

The average man does not as a matter of fact locate unknown places by the counties they are in, but by their directions from other known places, or by the railways, or in a lesser degree by the rivers or lakes they are on.

Geography, like everything else, must be learned, because it is useful knowledge for after life, or because it trains the intellectual powers, or because it is interesting in itself. I do not see that such a knowledge as the question presupposes comes under any of these heads. My question then really comes to this: why do children learn the counties of England?

J. FAIRGRIEVE.

New Southgate High School, N.

The School World.

A Monthly Magazine of Educational Work and Progress.

EDITORIAL AND PUBLISHING OFFICES,
ST. MARTIN'S STREET, LONDON, W.C.

Contributions and General Correspondence should be sent to the Editors.

Business Letters and Advertisements should be addressed to the Publishers.

THE SCHOOL WORLD is published a few days before the beginning of each month. The price of a single copy is sixpence. Annual subscription, including postage, eight shillings.

The Editors will be glad to consider suitable articles, which, if not accepted, will be returned when the postage is prepaid.

All contributions must be accompanied by the name and address of the author, though not necessarily for publication.

The School World

A Monthly Magazine of Educational Work and Progress.

No. 39.

MARCH, 1902.

SIXPENCE.

SCHOOL MATHEMATICS FROM THE UNIVERSITY POINT OF VIEW.

I.—Oxford.

By H. T. GERRANS, M.A.

Fellow and Tutor of Worcester College, Oxford.

IN the following attempt to comply with the request of the editors I shall endeavour to sum up the results of upwards of twenty years' experience as a teacher of members of the University of Oxford.

On a rough estimate it may be assumed that in each year the number of those who at matriculation enter upon an honours course of reading in mathematics is rather less than forty. These are distributed among the several colleges of the University, and the large majority are either scholars or exhibitioners.

I am invited to indicate directions in which the training of these students might with advantage have been supplemented before they left school, and at the same time to point out any particular weaknesses which I have noticed in such preliminary training. In other words, I am to find fault and to suggest methods of improvement.

Unfortunately, the failing to which attention needs chiefly to be called is not exhibited by mathematical pupils only. It seems to pervade the products of our school system. I refer to absence of virility. I do not allege that our schools are solely to blame, but lack of enterprise, inability to think, helpless dependence upon the teacher, are too frequent characteristics of those whom they send to the University.

This failing seems due in some measure to the prevailing mechanical view of the objects of school and University life. The educational worth of the mental training is apt to be overlooked or under-estimated, and the results are often subjected to a merely mercantile valuation.

The preparation which young mathematicians receive at school appears frequently to suffer from two definite errors of practice, and it is to these that I desire to invite attention. The first is over-specialisation, the second insufficiency of oral instruction.

With a view to clearness, it is necessary that I

should describe an imaginary instance, which is typical of many which have come under my notice. Between the ages of twelve and fifteen the pupil is put through a course of algebra and geometry, and is, perhaps, introduced to the elements of trigonometry. The method of treatment is apt to be more concerned with unimportant details than with any attempt to link the subjects together or to lay a proper foundation for subsequent work. The boy does not see the wood for the trees, and at this stage many a competent pupil despairs and falls away. If he is willing to proceed and exhibits some taste or capacity for mathematics, he is made to "specialise" at sixteen, or possibly, somewhat later. Thenceforward a large proportion of his working time is devoted exclusively to his special subject. Hours spent on general education are begrudged as a distraction. The literary side of his mind remains undeveloped. He acquires surprisingly little knowledge either of his own language or of any other (whether ancient or modern), and his instruction in natural science is often ineffective.

The harmful results of this kind of diet are noticeable in the student both at the University and in after life. Schoolmasters have sometimes expressed to me their surprise at the comparative failure of certain pupils in their career at Oxford or Cambridge. In such cases as I could investigate the usual explanation was that too exclusive attention to mathematics at school had produced mental nausea, destroying interest and paralysing effort. The highest mathematical honours are, moreover, rarely attained by a student whose education has been lop-sided. Such a man may be placed in the second class, or even in the first (though that seldom happens), but experience shows that he is unlikely to succeed later in the scholastic or in any other profession.

It may be alleged that the scholarship system is partly responsible for the state of things which I describe, and that the remedy is in the hands of the awarding bodies at the Universities. Such a retort would be based on a misconception. The Colleges naturally aim at selecting from among the candidates for their scholarships those boys who show the greatest promise of benefiting by a university career. The endeavour of the examiners is not merely to discover the candidate

who gains the highest marks in a given examination, but to estimate his capacity for improvement and the probability of his development. Of course mistakes are made. Tinsel is appraised as gold; hidden treasure lies unsuspected. But on the whole the university careers of scholars and exhibitioners confirm the opinions of those who recommend them for their honours and endowments. Some colleges set a "General Paper," and thence derive some information as to the literary side of a boy's mind which may justify them in electing him even though his mathematical attainments are somewhat lower than they have as a rule required. The recent history of mathematics at Oxford reveals several instances of men who attained the highest honours, although at their matriculation they knew nothing beyond the merest elements of algebra, trigonometry and conic sections. I attribute their success to the good general education received at school.

Insufficiency of oral instruction is almost as great an evil as premature or excessive specialisation. The boy is directed to read certain chapters in a given book and to solve a number of illustrative examples. His teacher, of course, explains any definite difficulties which are met with in the bookwork, and works out any problems over which the pupil has stumbled. Further, special tips, which are supposed to possess a value for examination purposes, are often provided and duly learned. I presume to suggest that a system of instruction which does no more than this is unwarrantably incomplete. The boy needs to be taught—not the details given in the text-books, which he must master for himself—but the "hang" of the subject, the aims of its different branches and their mutual relations. He must learn that "Algebra" is not A's book bearing that title, and that to master B's Conic Sections is not to exhaust that branch of mathematics or even to comprehend its scope and object. Fallacious proofs of important propositions must be unmasked and rejected, even though they can be "written out" in half the time which a sound proof requires. The removal of sundry difficulties may be impossible without the use of a more advanced mathematical method, but their existence need not be ignored. The slipshod habit of mind, which is occasionally produced by a course of instruction of the kind described, often proves to be irremediable at a later stage. Not a few of those responsible for scholarship examinations deliberately omit the differential calculus from the advertised range of subjects because they fear that its inclusion may encourage the hasty cramming of a few leading propositions as half understood tips.

Before proceeding to offer a few detailed suggestions I must state here that I am concerned throughout this paper with the young mathematician who either actually comes to the University or only just fails to win a scholarship or exhibition, and not with those whose candidature for some endowment is inexplicable.

It is convenient to arrange these remarks under

some of the branches of the subject which can be usefully taught at school, although in my opinion their independent treatment in class is most undesirable.

An ordinary course on *Algebra* seems to be overloaded. Complex problems of very slight educational value occupy far too much time, whether printed as bookwork or set as examples for exercise. The subject is studied too exclusively at first and is apt to be neglected later. In a scholarship examination the algebra paper is often done very badly. The principles (if known) are frequently forgotten, and little analytical insight is exhibited. Both these weaknesses are a hindrance to progress afterwards.

Plane Trigonometry would prove more interesting to boys if they had the opportunity of hearing something about the geometrical representation of the complex variable. De Moivre's theorem and its applications would thus be much more readily understood.

The intelligent study of *Pure Geometry* is essential. An adequate course of geometrical drawing (both plane and solid) is also indispensable, and it should run parallel with the study of Euclid's Elements or their equivalent. Scrapy knowledge of projective geometry is worth very little. The subject should be treated seriously or omitted altogether at school.

In *Co-ordinate Geometry* the general equation of the second degree is apt to be imperfectly known: the sooner it is grappled with the better. The wane of Dr. Salmon's influence must be recorded with regret.

The elements of the *Theory of Equations* and of the *Calculus* could, I think, be taught with advantage somewhat earlier than at present. The rejection of unconstructive artificial examples would free a considerable amount of time.

Sound instruction in the application of mechanical principles and the use of graphical methods in *Statics* should be available at school. The improvement in the last twenty years has been very great, but insistence on the two points mentioned is not superfluous.

In conclusion, I would say,—be practical, avoid the artificial, interest the pupil, and don't overwork him.

II.—Cambridge.

By ARTHUR BERRY, MA.

Fellow and Mathematical Assistant-Tutor of King's College, Cambridge.

THE Editors of THE SCHOOL WORLD have asked me to express briefly my views on the school training of boys who intend to specialise in mathematics. I have complied with the request; but I think it only fair to warn my readers that I have had no personal experience of school work, and that my knowledge of the mathematical content of the schoolboy mind is derived almost entirely from scholarship examinations, and from the study of the same mind when its owner

has passed into the undergraduate stage. It will be for schoolmasters to judge how far any suggestions that I make can be or ought to be carried out under the actual conditions of school life.

Mathematics, like other school subjects, can be justified either as an instrument of mental training or as containing information likely to be used in after-life; in other words, it can be treated as a part of education or as a part of technical instruction. I assume, for the purposes of this article, that the former is far the more important aspect, though of course due weight must be attached to the latter; to discuss the question here is obviously impossible.

From this point of view I make two criticisms of school mathematics—want of logical rigour and want of reality. These criticisms may appear to be mutually contradictory; but the contradiction is only apparent. I ask for logic in what professes to be a logical proof, and for reality in the form of concrete illustration, both of the primary ideas involved and of the results obtained by logical processes.

Let me illustrate my meaning by the case of geometry. The use of Euclid's *Elements* as a text-book is commonly supported on the ground of the supposed logical rigour of his proofs, though his methods are admittedly so cumbrous as to make the subject difficult and repellent to the average learner. As every mathematician knows, modern criticism has detected flaw after flaw in Euclid's logic. It is enough to remind my readers of the tacit assumption made in the first proposition of all, of the difficulties associated with the axiom of parallels, and of the amount of bad logic that has been expended on attempts to "prove" it, or to evade it. These logical defects may conceivably be remedied by judicious annotation by a teacher or writer; the process is in any case difficult, and adds greatly to the cumbrousness of the treatment. Moreover, traditional respect for Euclid renders it difficult to incorporate the necessary correction in the text of the proposition, so that it has to be relegated to a footnote or supplementary explanation. Thus the learner naturally thinks of it as a mere pedantic refinement, and acquires an early lesson in the art of following, or at any rate learning, what professes to be a proof, and subsequently acquiescing in a more or less perfunctory statement, veiled by the indignity of small print, that the "proof" is after all no proof.

I have no wish to maintain that any alternative text-book of geometry exists in which the acuteness of a German or Italian critic would detect no flaw. There are undoubtedly many which are at least as logical as Euclid's, and some that are much better in this respect, while they are incomparably superior in regard to simplicity and interest.

It may be worth while to point out once more the significant fact that, whereas English mathematicians have been almost always brought up on Euclid's book and Continental mathematicians in general have not, it is to the latter and not to the former that we owe nearly the whole of the great

modern discoveries in pure geometry, including the criticism of Euclid himself.

Geometry, when taught either on traditional English lines or with the modifications which I have suggested, is necessarily highly abstract and consequently difficult to all but a very few. The difficulty can be to some extent met by a copious use of concrete illustrations. Most students of child-nature agree that, long before any abstract reasoning is possible, some of the fundamental geometrical concepts, such as the line and the angle, may be made familiar by cutting up pieces of paper, by drawing diagrams and the like. At a much later stage I should like to see geometry accompanied by some geometrical drawing, and important propositions illustrated by diagrams of a much more precise character than the rough black-board drawing of the teacher or the corresponding pen-and-ink sketch of the learner. It can be pointed out, if thought desirable, that such accurate diagrams are illustrations, not proofs, of the corresponding theorems, or that they are at most rough verifications, not of geometrical proofs, but of the unproved axioms on which those proofs are based. These illustrations would, I believe, give vividness and reality to geometrical teaching; they would help the understanding and the imagination at the time and the memory afterwards.

I have purposely chosen as my main illustration the familiar subject of elementary geometry; and I have left myself little space to show the application of my views to other subjects. Recent developments in the teaching of natural science have done a good deal to add reality to the teaching of applied mathematics. A good many boys now have opportunities of seeing in a lecture-room or performing in a laboratory experiments illustrating propositions in mechanics which they are taught concurrently by the mathematical master. This tendency I should like to see considerably developed; though, on the other hand, I have not much belief in attempts to "prove," say, the parallelogram of forces by arrangement of pulleys and strings. For the mathematician, at least, the proof of the proposition is a logical inference from certain fundamental principles; the proof of these principles lies in the agreement with experience of the deductions from them. Our belief in the laws of motion ultimately rests not on crude experiments with falling bodies, but on the *Nautical Almanac*. But the laboratory experiment is of immense value to the learner, partly as a rude verification, still more as a concrete illustration, adding reality and vividness to his ideas. On the side of logic many of the current proofs in mechanics, as in other branches of mathematics, leave much to be desired.

Lastly, I should like to refer to the treatment of a subject which is on the border line between school and university mathematics, the theory of infinite series and allied topics, involving the notions of the infinite and the infinitesimal. The flaws in Euclid's logic are negligible compared to the gross want of logic and general confusion with which this subject is treated. An important proposition is often enunciated in a form which is

not even true; a "proof" follows; it is subsequently pointed out that the proposition is obviously not true in certain cases. The result is not merely a plentiful lack of understanding of notions which underlie a great deal of higher mathematics, but a positive corruption of the learner's logical sense. He not only wastes a good deal of time in trying to understand processes of reasoning that are not really intelligible, but he has subsequently to spend a great deal more time in unlearning what he has thus learnt.

III.—Glasgow.

By H. S. CARSLAW, M.A., D.Sc., F.R.S.E.
Lecturer on Mathematics in the University of Glasgow,
and Fellow of Emmanuel College, Cambridge.

THE present satisfactory position of secondary education in Scotland is due in great measure to the work of the Scotch Education Department, and to the changes which the last Universities Commission introduced in our four Universities. Under the former conditions there was no Entrance Examination to the Faculty of Arts, and no organised supervision of the secondary schools, other than those under Government, while in all the Universities it was found necessary to provide for the teaching of elementary work, in many cases to classes of over one hundred. Now there is a severe Preliminary Examination, which must be taken at the beginning of a student's course, and an immediate result has been the almost complete abolition of the Junior Classes, and a corresponding rise in the average work of the schools. A still more important change has been the institution of the admirable system of Leaving Certificate Examinations, conducted by the Scotch Education Department, which is accompanied by an inspection of all the schools, public or private, which desire to submit their pupils for these examinations. The care that has been taken in the setting of the papers, and in the drafting of the schedules for the different subjects, and the growing value attached to the certificates by professional bodies, have caused these examinations to grow yearly in importance. Their influence in the improvement of school work cannot be over-estimated. Alterations in the regulations are being made as the need for such becomes clear, and important changes have been announced in the last few weeks with the object of making these, more than in name, examinations which will be taken on leaving school, and of encouraging scholars to take the certificates in groups of subjects, instead of one by one. An effort is also being made to keep the members of the upper forms longer at school, a change which is much needed, at any rate in some parts of the country, where boys leave school for the Universities at far too early an age.

In this connection it is recognised that the present system imposes too heavy a burden upon

the higher classes, as it is obviously impossible that time can be found for really advanced work, if Latin, Greek, Mathematics, English, and French or German, are all studied concurrently. So long as our Scotch Universities persist in awarding their entrance scholarships on the results of an examination which requires a knowledge of all these subjects on a high standard, the present school arrangements will probably continue. There is, however, a wide-spread feeling that the regulations now in force were devised for other conditions, and that the time has come when these Universities must consider whether they ought not to award their entrance scholarships for excellence in Classics, Mathematics, Science, or Modern Languages separately; or better, for suitable combinations of these; while requiring, of course, that the successful candidates should have passed the Preliminary Examination in their other subjects. With this alteration the work of the highest form would be simplified, and the Honours Leaving Certificates obtain their proper place as the equivalent of a Scholarship Examination in their subjects. The pupil whose chief interest is in mathematical work would be freed from excessive attendance on advanced classics; there would be time for properly-conducted courses in physics or chemistry; and the Scotch Universities would have taken a forward step in the encouragement of good science work in the schools.

So much for the Universities,—we must now look more closely at the schools. The battle of mathematical teaching seems at present to centre round the subject of Geometry, and demands are being made in several quarters for the abolition of Euclid's system, and in others for the complete removal of the subject itself from the school curriculum. It may be that this is a natural reaction from the period in which absolute adherence to Euclid's propositions, sequence, figures, and even words, was in many cases sternly enforced; but anyone who knows the work of the Scotch schools must be aware that most of the suggestions which practical people¹ in England are now bringing forward as improvements in the teaching of this subject have been the stock-in-trade of many a teacher with us for years. Everyone admits that before demonstrative geometry is taught the pupils should have gone through a course of practical geometry; that they should know by the use of the ruler, the compasses, and the protractor, the properties of the figures they handle, and about which they are later to reason; and it is unfair to assume that this is not in many cases already done. In my own experience I know of schools in which these methods are generally used, and I have never found a teacher unwilling to introduce them, so far as time permitted. Still, there is room for improvement. Examiners should encourage the drawing of appropriate and accurate figures for

¹ See the Memorial to the British Association Committee upon the Teaching of Elementary Mathematics, from Public School Masters, in the February number of THE SCHOOL WORLD.

the propositions; this should be regularly done in school. In a first course, if Euclid is to be taught, Book II. need not be taken until after Book III., 1-34. Several of the propositions in Book III. will appear less convincing after the demonstration than before: these may be omitted, or discussed otherwise. Too much time is given to Book IV.; and the difficulties of Book VI. disappear, if incommensurable quantities are put aside, and a simple arithmetical treatment of ratio and proportion for commensurable quantities is substituted for Euclid's theory. There is scope for further work in solid geometry and mensuration. This branch of mathematics is to a great extent neglected in school work; and the time that is devoted to the study of geometrical conics might perhaps be given to this subject. The advantage to be derived from demonstrative geometry—admitting that it is a valuable mental discipline—will have been obtained from the course in pure geometry already taken, and to devote further time to it in school seems a mistake.

The subject of Arithmetic offers special opportunities to a good teacher, and much depends upon the way in which it is taught. It is true that an immense waste of time and labour is involved in the acquisition and use of our complicated system of weights and measures, and until these are abolished the present state of things must remain: yet, in at least the square and cubic measures, illustrations by simple models can be given, which make the memory work lighter. Such aids are not as generally used in arithmetical work as they might be. The antiquated system of teaching proportion ought now to disappear, and the general use of the unitary method would reduce what are called the higher rules to simple examples of a few general principles: yet I know of cases in which the old system has been encouraged, and headmasters blamed by higher authorities for using the newer methods, which they were pleased to say involved great waste of time. In this matter the elementary-school teachers seem to blame. There is a general complaint from the secondary schools, into which the County Council bursaries now send pupils, that they have to spend considerable time in improving the methods of arithmetic which have been taught in the elementary schools. There is too much dependence by the pupil on the answer at the end of his book, and too little thought about the kind of answer he should expect. Immense labour is wasted in the earlier classes on examples involving a large number of figures, when a smaller number would serve the purpose as well, and the problem would have a meaning which the pupil would be able to grasp. The decimal notation ought not to be so great a difficulty; and boys should have a fair idea of what a metre and its divisions actually are. It is surprising how few, even in a good school, will attempt to help themselves in a problem involving distances or areas by an easily drawn figure; and how many prefer to quote a formula, of the truth of which they are probably uncertain, rather than in a line or two

make the argument absolutely clear. After leaving school they would never attempt the solution of any actual question of this kind without such aid. This fatal abuse of formulæ and rules, which has done so much to kill many a boy's interest in mathematics, when he learnt its rudiments in arithmetic, should cause practical men to hesitate before they introduce such methods into what is called higher mathematics. Arithmetic teaches many things: among them, correct habits of thought, neat methods of work, rapidity and accuracy in obtaining numerical results. No one of these may be sacrificed to the other; in many cases all are forgotten except the last.

The teaching of Algebra and Trigonometry in the schools is probably much influenced by the requirements of the University Entrance Examination, as in Scotland there are very few schools which may not be preparing some scholars for entrance to one of the four Universities. There must be a great temptation for the teacher to take advantage of the present arrangement in which a Pass and an Honours standard are contained in the same paper, and to prepare his weaker pupils to answer a certain number of easy bookwork questions in this examination, rather than to give them a careful grounding in the principles of the subject. They must now have found that by this means it is possible to obtain a mere pass in the examination, and the results are clearly seen in the somewhat unsatisfactory nature of the work of the average student who enters the Ordinary (Pass) Mathematical Class in the University. While welcoming the marked improvement in the work of the best men—and for this it seems clear that we have to thank the Bursary Examination and the Leaving Certificates—so far as my experience goes, I cannot admit any such gain in the mathematical knowledge of the average student as the present system was expected to produce. Evidence is not wanting that in many schools the symbols are being used in a mechanical and unintelligent way, and that the pupils "are inclined to regard algebra as a very arbitrary affair, involving the application of a number of fanciful rules to the letters of the alphabet."

The true teacher must base his algebraical rules in every case upon arithmetical principles, and their first application will not be to the simplification of, at that time, meaningless algebraical expressions, but to the solution of definite arithmetical problems. The real difficulties which face the beginner must be explained, but the explanation must be an arithmetical one. The pupil will progress if you show him the use which can be made of his subject, and if you make algebra simply an extended and generalised arithmetic. His work should be written out neatly, and in logical form; it ought not to consist, as it too often does, of a few lines of disconnected algebraical symbols. The relations between the different parts of his subject should always be borne in mind; and, for example, factors should at first be used in solving equations rather than in simplifying very complicated fractions. The practical parts of the

subject—*e.g.*, the use of logarithms—might well be introduced much earlier than usual; and, thanks to Professor Chrystal's efforts, the knowledge of the applications of the graphs of the simple algebraical functions is now general. Such instances could be multiplied, and these changes are now commonly made.

The teaching of mathematics must in the end depend upon the teachers themselves, and they will be the first to welcome the present discussion and the keen interest that is being taken in their subject. They must also recognise that a step has been taken in the right direction by the Training Colleges and the Scotch Education Office in encouraging the attendance of the Normal Students at the University, and it is a most promising sign in the University with which I am connected, that so many of these future teachers have the ability, and are finding the time, to prepare themselves for Honours degrees in mathematics and science. Much may remain to be done in the training of teachers, and in the building up of strong mathematical and science departments in the secondary schools; but the growth in the number of these large central schools, the increasing value that is being placed upon a good university degree, and the corresponding improvement in the position of members of this important profession, are factors the influence of which will more and more be felt.

ELEMENTARY TRIGONOMETRY IN SCHOOLS.

By G. B. MATHEWS, M.A., F.R.S.

EVERY one who has had much to do with examining schools in elementary trigonometry, or with teaching junior classes in universities and colleges, must have observed the striking inequality of attainment in this subject which boys attending and leaving schools display. It is in the hope of abating this inequality, certainly not due to a difference of average capacity in the pupils, that this article has been written.

By elementary trigonometry I mean plane trigonometry up to the solution of triangles, with easy and practical applications, such as are required in mensuration, land-surveying, and elementary dynamics. It is clear, as a result of experience, that a boy of fair (not exceptional) mathematical ability can be taught in such a way that by the time that he is fourteen years old, or earlier, he has an intelligent and working knowledge of the subject as above defined. It is equally clear that boys of the same age and capacity, supposed to be taught trigonometry, and presented for examination in the subject, know less than nothing about it: less than nothing, because they have never looked at it in the proper light, cannot make the simplest application of it, and have made a vain effort to learn trigonometrical formulæ, and the proofs of them, by rote.

To show that I am not exaggerating, I will give a few specimens out of papers which I have recently examined:—

$$\begin{aligned} (1) \quad \cos(90^\circ + A) &= -\sin A \\ &= \cos 90^\circ \cos A - \sin 90^\circ \sin A \\ &= \frac{1}{2} \cdot \cos A - 1 \cdot \sin A = \frac{\cos A}{2} - \sin A \\ &= \cos A - 2 \sin A = \frac{1}{\sin A} - 2 \sin A = -\sin A. \end{aligned}$$

$$(2) \quad \frac{a}{\cot B + \cot C} = a(\tan B + \tan C) = \frac{a(\sin B + \sin C)}{\cos B + \cos C}$$

(3) If the angle of an equilateral triangle was the unit for measuring angles, because it is 60 degrees, a radian would be $57\frac{3}{4} \times 60 = 3465^\circ$.

Of these the first betrays the unintelligent, and therefore ineffectual, effort to remember formulæ; the second a lamentable ignorance of the laws of algebra; the third a failure to understand the first principles of measurement. The worst of it is that these same boys had evidently tried to get up the more advanced parts of the subject, which they were quite incapable of understanding.

At first sight, elementary trigonometry is not a very interesting subject to teach. Supposing that graphs and mensuration have been previously discussed (as they ought to be), and that the elements of geometrical proportion have been inculcated, there are very few fresh notions to instil. But the combination of notions, previously acquired, affords valuable exercise, and the notation of trigonometry provides useful checks on the student's real knowledge of the laws of algebra. It is in these respects that trigonometry is educationally serviceable. And familiarity with its formulæ is best acquired at an early age, so that for this reason alone it is properly a school subject: just as, in all probability, a century hence elliptic functions will form part of an ordinary school-course.

I will now venture to indicate what seem to me to be the prevalent weak points in the school teaching of this subject.

The measurement of angles is, in itself, a small matter. It may or may not be desirable that junior classes should be made acquainted with the radian as a unit of measurement (personally, I think they should, but not at the beginning of their course); but, at any rate, they should be made to understand the ordinary sexagesimal method, learn to set off angles with a protractor, and have a fair idea of the size of any given angle (such as 57° , 80° , etc.), which lies between 0° and 180° . It is quite unsatisfactory to find schoolboys able to give a perfect account of different systems of measurement, and at the same time quite unable to answer any question such as that attempted in (3) above, or to say how many degrees the hour hand of a clock turns through in ten minutes; yet this inability is quite common, and discloses (I think) a radical misconception of the way in which geometrical and physical quantities are measured.

Coming next to the definitions and values of the trigonometrical ratios. Strangely enough, in some schools (and those by no means the worst), the old

definitions by which $\sin A$, &c., are denoted by lengths of segments are still in vogue. It is best to avoid this, simply because it is both cumbersome and antiquated. In a first course it is sufficient for the pupil to understand the definitions of $\sin A$, $\cos A$, $\tan A$ as an abbreviation for $\sin A/\cos A$, and perhaps $\cot A$ as $1/\tan A$, or $\cos A/\sin A$. But these ratios should be *really* known, and approximately realised for the whole range from -90° to 180° , or at least from 0° to 180° . A four-figure table of natural sines, etc., is a great help, and approximate calculations from geometrical constructions afford a useful verification, while showing the limits of graphical methods.

Next in order naturally come the solution of right-angled triangles and applications to elementary problems in heights and distances. It is remarkable to see how this is neglected or postponed. Suppose that PMN is a triangle, right-angled at N: the ordinary boy is quite ready to tell you that $MN/PM = \cos M$, but he scarcely ever draws, for himself, the conclusion that $MN = PM \cos M$, and this inference is seldom brought before him, in spite of its importance both in geometry and mechanics. This failure to grasp the relations between the parts of a right-angled triangle is, perhaps, the most serious and most common defect in the schoolboy's trigonometrical apparatus. It often remains after he has learnt the rules for solving oblique-angled triangles. Again, a boy is often taught the complete set of ratios for particular angles, such as 30° , 45° , 60° , in a surd form without any reduction to decimals, and without any suggestion that a decimal is always the proper, and often the only practical way of expressing a trigonometrical ratio. The consequence is that a college teacher of dynamics not un-naturally infers that his students, on coming to him, have no practical knowledge of trigonometry at all.

It is a great mistake to go on to the addition-formulæ and solution of oblique-angled triangles until what we may call the trigonometry of one angle and its applications have been thoroughly mastered. Unfortunately it "pays," or is thought to pay, to hurry on a class so as to cover a syllabus in a certain time. There is no reason why boys should not become acquainted with the addition-formulæ quite early, but they should not be prematurely drilled in writing out a formal proof of them. In the same way they may be exercised in computing unknown parts of the general triangle merely by rule, but they should not try to learn the proof of the rule till they are properly prepared for it. And they should not be allowed to imagine that they are *learning* anything new when they practise computation by a rule that they do not know how to prove.

This leads to the remark that nowadays the art of computation is very much neglected. Out of hundreds of boys hardly any will be found who uses a co-logarithm, who arranges his work properly, and adopts economical methods: even those whose arithmetic is trustworthy form a small minority. Although it is rather irrelevant to say so, I may be

permitted to remark that, so far as I can judge, it is arithmetic which is the worst-taught mathematical subject at the present time.

The boy who has learnt his trigonometry in a wrong way avoids drawing a figure whenever he can, and if he is obliged to give one, it is generally incorrect or grossly out of proportion, unless it is the stock figure for a piece of bookwork. Whenever the opportunity occurs, and especially in the solution of triangles, the pupil should be required to draw a figure; preferably, of course, with instruments. But even without instruments it is possible to draw a figure reasonably consistent with given conditions, and this, at any rate, should be insisted upon.

The difficulty of algebraic sign is a serious one, though it is diminished if an easy course of graphs has been previously given. Few of the text-books point out the convention that $BA = -AB$, and those that do often ignore it afterwards. It does not seem to be profitable to spend much time with young boys in the discussion of positive and negative angles in all the four quadrants. They often confuse the sign of an angle with the sign of one of its ratios; and in proving such a formula as $\sin(180^\circ + A) = -\sin A$ from a figure they not infrequently fail to indicate correctly, or else omit altogether to show, which are the angles intended by A and $(180^\circ + A)$. In teaching these formulæ it is advisable to give the angles separately as well as in a combined figure.

From an examiner's point of view the average standard of performance in writing out bookwork is not a high one. Directions for constructing the figures are often incomplete or absent, alternative cases are overlooked, and in other ways a scrappy style is prevalent. Too much drill in writing out bookwork is certainly to be deprecated; but a moderate amount of it is necessary, and thoroughness (*not servile reproduction*) should be insisted upon.

In this, as in other subjects, *festina lente* is a good motto. After all, it is the very rudiments of the subject which are of most practical importance, and if these are thoroughly learnt and applied, further progress becomes easy and natural. Even for examination purposes this policy is the best; for although it is unfortunately true that an examiner is occasionally compelled to pass a candidate whose knowledge he feels to be superficial, he is generally able, with a little care, to avoid such an unfortunate necessity.

At the recent meeting of the Association of Technical Institutions Lord Avebury was elected President in succession to Sir William Hart-Dyke. During the course of his address, in which he reviewed the neglect of science and modern languages in our national education, the new President made several remarks which might with advantage be widely circulated. "An education which excludes science is a one-sided education, and the most learned classical scholar, if he knows nothing of science, is but a half-educated person after all." "A young relative of mine, who had passed with credit through a great public school, was sent to study engineering, and was asked to describe a theodolite. 'Theodolite,' he said, 'is a hater of God.'" "We hope that Britannia may long rule the waves, but it is as important that she should rule the steam engine and the dynamo as well."

THE BRITISH ASSOCIATION DISCUSSION ON THE TEACHING OF MATHEMATICS.¹

By G. H. BRYAN, Sc.D., F.R.S.

Professor of Mathematics in the University College of North Wales.

THE teaching of mathematics affects such a great variety of classes of student, and the aims of different students are so widely divergent, that it is impossible to remove the obvious disadvantages of the present system without introducing some great difficulties in other directions. It is sufficient to compare modern text-books with those written, say, twenty or thirty years ago, to find many points of superiority in the latter, though there has been a continuous attempt during the interval to bring books "up to date" by the introduction of the "most modern and improved methods." It may now be taken for granted that some important changes are at the present time desirable in the order of *learning* mathematics in this country (for I regret to find that so much is being said about *teaching* and so little about *learning*), but it is greatly to be feared that, soon after a change has been made, the new system will be found to have its own drawbacks no less than the old.

Of the conclusions² enumerated on p. 100 of the Report, Nos. 1 and 2 refer more especially to geometry, and in this connection one important point suggests itself. In the old style of things, the use of algebraic symbols was prohibited in examinations on Euclid. Is it not the fact that much greater *life* and *reality* can be put into the study of geometry by encouraging, instead of excluding, the use of algebraic formulæ? Take, for example, I. 32. After reading the corollaries, a student may well be exercised in writing down either in right angles or degrees the angles of regular polygons with different (given) numbers of sides, or finding the number of sides in a regular polygon whose angle is given. Then he may be made to write down the expression for the angle of a regular polygon of n sides, and he thus gets to appreciate the use of an algebraic formula for generalising results, where arithmetic only enables him to deal laboriously with each separate case.

Take, again, II. 4. The old proof consists in building up a framework of scaffolding on the divided line with a diagonal tie, and the student is made to give nearly all his attention to proving, first, that a certain figure is equilateral, next that it is equiangular, and therefore that it is a square; and by this time he naturally fails to see the purport of the proposition. Why should not the proposition be replaced by the following:—"Verify by means of a geometrical figure that

$$(a+b)^2 = a^2 + 2ab + b^2,$$

¹ British Association Meeting at Glasgow, 1901. Discussion on the Teaching of Mathematics, which took place on September 14th at a joint meeting of two sections. Section A—Mathematics and Physics. Section I.—Education. Chairman of the joint meeting, the Right Hon. Sir John E. Gorst, K.C., M.P. Edited by Professor John Perry. 101 pp. (Macmillan.) 2s. net.

² See p. 91 of this issue.

leaving out the above by-play? Then the student will really learn, practically at a glance, some useful ideas (assuming always that he is possessed of a little common-sense). Going to Book III., the following uses of algebra suggest themselves at once. "The longest and shortest lines to a circle radius a from a point distant d from the centre are $a+d$ and $a-d$ if $a > d$ (III. 7), or $d+a$ and $d-a$ if $d > a$ (III. 8)." "If d is the distance of a chord from the centre, and a is the radius, the length of the chord = $2\sqrt{(a^2-d^2)}$ (III. 15)." "The length of the tangent to a circle from a point distant d from the centre = $\sqrt{(d^2-a^2)}$." Each of these can of course be preceded by simple numerical examples. This use of algebra in the study of geometry has the following advantages:—

(1) It breaks down the hard and fast line between algebra and geometry.

(2) It furnishes the student with a number of easy examples and exercises in geometry. The great difficulty which a teacher has to contend against in Euclid, viz., that his pupils have no "happy mean" open to them between racking their brains over difficult riders, and merely learning the propositions mechanically, is thus obviated.

(3) It introduces the beginner in algebra to the use of symbols for representing concrete quantities (lengths, angles, &c.), and to the nature and meaning of an algebraic formula. This overcomes a difficulty which I for one keenly felt in beginning algebra, namely, that the early stages of the work consist in performing operations, like those of arithmetic, on mere collections of symbols which convey no meaning in themselves, and which work appears at the time to be mere useless drudgery.

Conclusion No. 3 (decimals ought to be used). I suppose every "thoughtful teacher" (as Prof. Perry would call him) and examiner has lamented the ignorance of his pupils on decimals in this country. Where the metric system is used "weights and measures" naturally lead to the notion of decimals, and it is easy to pass from 25 metres 6 decimetres 7 centimetres to 25.67 metres. In this connection are we not merely groaning under the system which requires our school children to waste their early arithmetic lessons over farthings, pennyweights, kilderkins, furlongs, square poles of $30\frac{1}{4}$ square yards and nails? In teaching decimals one reform is especially necessary; at present many students never learn to fix the decimal point in a product of two decimals of six and seven places without multiplying to thirteen places, and we get such answers as $\cdot 625 \times \cdot 16 = \cdot 00001$.

(4) "The numerical evaluation of complex mathematical expressions" is mere mechanical drudgery on which far too much time is wasted at present, and I am sorry to see Prof. Perry advocating this work. I can well remember my early introduction to algebra, which consisted in being made to work through all the sums in "addition, subtraction, multiplication, division, greatest com-

mon measure, least common multiple, fractions, involution and evolution," and I still retain my hatred of this drudgery, which appeared to me then, and still appears to me, of no earthly use whatever. It produces a class of candidate who cannot simplify an ordinary fractional equation or expression without multiplying it into a cumbersome and unwieldy form, who cannot even write down the square or cube of $a+b$ without using long multiplication, and who does not know that a square is never negative, and that $\sqrt{a+b}$ is not equal to $\sqrt{a} + \sqrt{b}$.

On the other hand, elementary classes may sometimes be greatly interested by talking to them about a function of x , and the condition that it should be divisible by $x-a$, illustrated, of course, by only simple quadratic functions. Why should a student waste hours over these long and clumsy multiplication, division and square root sums operating with functions of any order, when he knows nothing of the ordinary properties of even quadratic expressions? A text-book on the elementary algebra of linear and quadratic expressions would be, in my opinion, of great value for beginners, and it is to be noted that such a book *might* be made (whether advantageously I do not say) to include even the notation of the differential calculus.

(5) Logarithms are commonly taught long before a boy is able to calculate them, and not very long after he has learnt that $a^m a^n = a^{m+n}$. But fancy introducing "conversion of common logarithms into Napierian logarithms" into an elementary course of arithmetic, as Prof. Perry proposes in his syllabus (Report, p. 25)! To understand Napierian logarithms properly involves a knowledge of the binomial theorem, the notion of a limit, the exponential theorem, and, indirectly, the theory of convergency of series. To mystify a schoolboy with logarithms calculated, for no obvious reason, to an incommensurable base is the best way to prevent his learning mathematics.

Conclusion No. 7 (examination cannot be done away with). During the last five years I have had experience in teaching some fairly typical specimens of idle and ignorant students, but some of the most incorrigibly lazy ones I have come across have been electrical engineering students whose excuse for neglecting their work has been that they were not required to pass any examinations on it. I do not believe that it is desirable to abolish altogether the system of examination by external examiners, as this system exerts a healthy counteracting influence against the teacher's inevitable tendency to override his pet fads. The reform that appears most needed in the examination system is the abolition of what I call "pigs in clover" riders, depending more for their solution on dodgy artifices than on knowledge of principles. When a question is set such as: "Define the centre of gravity of a body. ABC is a triangle; three geese whose masses are proportional to $b^2+c^2-a^2$, $c^2+a^2-b^2$, $a^2+b^2-c^2$, set out to walk along the sides with velocities proportional to $\sin^3 B - \sin^3 C$, $\sin^3 C - \sin^3 A$ and $\sin^3 A - \sin^3 B$;

prove that the locus of their centre of gravity is given by the trilinear equation. . . ." (some complicated formula no doubt),¹ very few candidates will answer the *bookwork* properly. At the same time one thinks of the Scotch examiner who was told, "You may set new questions, but you will get the old answers."

The Civil Service Commission have been attacked in this connection by Prof. S. P. Thompson, and I am glad they have found a champion in Prof. Langley. They have recently shown far more desire to introduce tractable questions than has been shown by the candidates to answer them. The worst sinner is the Board of Education, with its syllabuses, its rigid percentages of marks, and the premium it places on a certain kind of superficial cramming in examinations of matriculation grade, and the great disability it imposes on students who, if they had proper facilities, might carry their mathematical studies a little higher. The idle student who wastes a year in learning Euclid III. and forgetting some of his King's Scholarship algebra is rewarded with a first-class certificate; those who try to learn trigonometry and logarithms have no time to grasp this work in a course which takes them fifty-six hours' work a week, and they are punished. The object of an education in mathematics should be to *teach men to think*; the ideal of the Board of Education appears to be to turn out teachers with every trace of thinking power ground out of them.

In Conclusions 6, 8, 9, 10, Prof. Perry gives us an idea of what he considers a "thoughtful teacher" ought to do. It is disappointing to find so much said about "thoughtful teachers," while another very influential factor has been left out of consideration altogether, namely, the "thoughtless learner." There are probably few mathematical teachers who would not gladly introduce the calculus much earlier in their courses if only they had the privilege of teaching a picked class of "thoughtful learners." But I would ask Prof. Perry the question, "If the ideal, perfectly thoughtful teacher is placed in charge of a class of perfectly thoughtless learners, what happens?" The answer is that he will succeed "in producing the higher emotions and giving mental pleasure—hitherto neglected in teaching almost all boys," in a very different sense to that contemplated by Prof. Perry on p. 4 of the Report, and his less "thoughtful" successor will devote his attention to restoring order in the class and making the boys work. Is it not a fact that the most successful mathematical teachers are, very frequently, those who put least originality into their teaching? And it is amusing to see Prof. Perry giving the teacher grandmotherly advice "to endeavour to find out what sequence is best educationally for the particular kind of boy whom he has to teach," when he has to teach all sorts and conditions of boys in one big class, and that for a small salary.

¹ The *Mathematical Gazette* is a hardened sinner in its partiality for this sort of question.

The fact is that formal blackboard lectures are a very ineffectual means of teaching improved methods to a *beginner*. Besides being wasteful of time, they require him: (i.) to *listen* when the teacher is talking, (ii.) to *look* at the blackboard when he happens not to stand in front of it, (iii.) to *write down* notes of the lecture, and (iv.) to *think* of the method of reasoning, *all* at the same time, and if he fails for a moment to perform simultaneously any *one* of these four operations he loses the whole thread of the lecture. Hence it is that so many pupils after the most "thoughtful" lecturing reproduce faulty text-book proofs which they have been warned against by their teachers, but which they can at least "get up."

The present position of affairs in regard to the teaching of mathematics has, to my mind, come about in this way. Formerly our schools and colleges were given over mainly to the study of classical and literary subjects, and mathematics was looked upon as a portion of an arts course. The rigid deductive system was undoubtedly admirably suited to the object then held in view. With the development of experimental science new teachers have been appointed all over the country for physics, chemistry and biology, *but next to nothing has been done to meet the greatly increased demand for mathematical teaching thus produced*. The same teachers who provided efficiently for the teaching of mathematics on the classical side have now thrust upon them an influx of new pupils having quite different requirements. The mathematical master is thus placed in the position of a "tweeny maid" or "buffer" between two opposing forces—the classical side and the modern side, and between these two stools it will be a great credit to him if he does not fall to the ground.

The proper remedy for this state of affairs is that the mathematical staffs of our schools and colleges should be largely reinforced so as to provide a more varied choice of courses of study. The numbers of teachers and the hours given to classes in mathematics at most schools and colleges are ridiculously small compared with the corresponding numbers in the case of the study of language. Latin, Greek, French, German and Welsh each have separate teachers, and Dutch, being the language spoken at Pretoria, will soon be added to the list, while one man is expected to do all the mathematics. The pupil who studies different languages finds the same grammatical principles, the same general ideas running more or less through all. In about the same number of hours that he gives to *one* language he is expected to learn mathematics, where he *should* find an endless vista of new thoughts opening before him at every step, and he finds it hard to take in so vast a field of ever changing matter. The result of some of the reforms proposed by Prof. Perry, if tried on this particular class of student, will be to increase further the rate at which the panorama whirls past him. The little good [if any (?)] that the arts student derived from a matriculation course in Euclid, arithmetic, and algebra, will all be destroyed if vectors, angles

between lines and planes and Simpson's rules are crowded into his syllabus. On the other hand, the science student who gets some idea of the nature of things in a physical laboratory finds (or is supposed, by his teacher of physics, to find) the classical student too slow for him, and wants to get on to the calculus as soon as possible.

Under existing conditions, the most promising direction for reform appears to be in the omission of formal proofs of such theorems as the parallelogram of forces, the binomial theorem, the formulæ for the sine and cosine of $A + B$; but these omissions are already made by many teachers with all but their best pupils. I fear that analytical and geometrical conics, as at present taught, will have to go to the wall, with the result that tangent and asymptote properties and curve-tracing will be worse understood by students of the calculus than they are at present. This is a pity, for a study of conics could and ought to be of the greatest possible value to the applied mathematician, but as at present taught the general principles are obscured by the artificial character of the treatment. A possible way out the difficulty may be to substitute conics for lemniscates, cissoids, and cardioids as illustrations of the calculus.

As for introducing, in a scrappy way, "the distinction between a scalar and a vector quantity" (p. 29), or the relations between (x, y, z) and (r, θ, ϕ) , p. 31, these may well be left till a more advanced stage than is contemplated by Prof. Perry.

To sum up, then:—

The teacher can do very little to reform the teaching of mathematics to large classes of elementary pupils, as if he departs materially from the methods of the text-books, the *learning* of mathematics will suffer accordingly.

The text-book writer can do practically nothing to reform the teaching of mathematics, otherwise his books will not sell and other books will be used instead. This is particularly hard when faulty methods or inaccurate statements have to be reproduced (as is frequently the case) in order to make a book saleable.

The examiner can do much to reform mathematical teaching by modifying the character of his questions so far as this is consistent with his syllabus, and with giving candidates a fair chance of scoring marks.

The governors of educational institutions could greatly reform mathematical teaching by increasing the mathematical teaching staffs and giving mathematics a more prominent place in the curriculum. This must come about sooner or later, and the sooner the better.

There is no royal road to *teaching* mathematics, for it is impossible for a boy of given capacity to *learn* more than a certain amount in a certain time, the rate of learning varying with the individual from zero upwards, and if it be attempted to introduce new ideas too rapidly into the course the result must be a hopeless failure.

When the necessity is realised of including the study of French and German in the curriculum of every science student, it will be interesting to see

whether a question as to the teaching of modern languages arises similar in character to the present discussion on the teaching of mathematics.

At the end of the Report of the British Association Discussion on the Teaching of Mathematics Prof. Perry states a number of principles upon which he considers there is a general agreement. These conclusions provide definite subjects upon which attention can be concentrated, and we print them in full, so that they may receive consideration by mathematical teachers. In his review Prof. Bryan deals to a large extent with the principles involved in the conclusions given by Prof. Perry, and points out some difficulties in their practical application.

(1) Experimental methods in mensuration and geometry ought to precede demonstrative geometry, but even in the earliest stages some deductive reasoning ought to be introduced.

(2) The experimental methods adopted may greatly be left to the judgment of the teacher: they may include all those mentioned in the elementary syllabus which I presented.

Some of the things for which I contend were put so prominently forward that, if speakers did not object to them specifically, they may almost be taken as being agreed to. They are such things as these that follow: most of them are agreed to specifically by about half my critics.

(3) Decimals ought to be used in arithmetic from the beginning.

(4) The numerical evaluation of complex mathematical expressions may be taken up almost as part of arithmetic or at the beginning of the study of algebra, as it is useful in familiarising boys with the meaning of mathematical symbols.

(5) Logarithms may be used in numerical calculation as soon as a boy knows that $a^n \times a^m = a^{n+m}$, and long before he is able to calculate logarithms. But a boy ought to have a clear notion of what is meant by the logarithm of a number.

(6) In mathematical teaching a thoughtful teacher may be encouraged to distinguish what is essential for education in the sequence which he employs, from what is merely according to arbitrary fashion, and to endeavour to find out what sequence is best, educationally, for the particular kind of boy whom he has to teach.

(7) Examination cannot be done away with in England. Great thoughtfulness and experience are necessary qualifications for an external examiner. It ought to be understood that an examination of a good teacher's pupils by any other examiner than the teacher himself is an imperfect examination.

I have not much doubt as to the unanimity with which everybody may be said to have agreed explicitly or implicitly to all the above statements. About these that follow I am in more doubt. More than half my critics will, I believe, agree to them all for all students. I think that every one of my critics will agree to allow a judicious teacher a free hand, especially when he knows that his

pupils are likely to need the use of mathematics in their other studies, and especially if they are likely to become engineers—that is, men who apply the principles of natural science in their daily work.

(8) A thoughtful teacher ought to know that by the use of squared paper and easy algebra, by illustrations from dynamics and laboratory experiments, it is possible to give to young boys the notions underlying the methods of the infinitesimal calculus.

(9) A thoughtful teacher may freely use the ideas and symbolism of the calculus in teaching elementary mechanics to students.

(10) A thoughtful teacher may allow boys to begin the formal study of the calculus before he has taken up advanced algebra or advanced trigonometry, or the formal study of analytical or geometrical conics, and ought to be encouraged to use in this study, not merely geometrical illustrations, but illustrations from mechanics and physics, and illustrations from any other quantitative study in which a boy may be engaged.

THE ETHICS OF PRIZE-GIVING.

By F. E. KITCHENER, M.A.

Late Headmaster of the High School, Newcastle-under-Lyme.

FOR a teacher to be dependent on rewards for the stimulus he gives his class is felt to be in itself a confession of weakness. Readers of Mr. Arthur Sidgwick's well-known essay on "Stimulus" must feel that, given a class of pupils whose capacity does not range between very wide limits, the teacher ought to think himself to blame if he cannot stimulate his class by means of the work itself. I do not know that any one's remembrance of his school days would compel him to own that his interest in his work or his general intellectual keenness was ever permanently increased by any medal or book-prize dangled before his nose. In an ideal school, with a born teacher to teach and no outside pressure to distract, the sense of intellectual growth would be more than enough to spur on the capable student.

Hence it is that many teachers, perhaps too confident that they, trained or untrained, were born to teach, and not recognising that in their flocks there are more often geese than swans, are eager to throw away the meretricious stimulus of prizes and other school distinctions, and trust only to the pleasure of the struggle after intellectual power as its own reward.

It is urged too that, as all run in the race and but one receives the prize, there is much self-seeking and selfishness encouraged by offering rewards at all. Is it not enough to encourage a useful rivalry if the class knows by the master's criticisms which boy has produced the best copy of Latin verses or the best solution of a geo-

metrical problem? Here one boy is successful one week and one another; each respects his comrade's powers, and, if anything, overvalues his opponent's ability and underrates his own.

What need that the difference should be evaluated into weekly marks, and a whole term's anxious struggles culminate in that rush of all uncharitableness that even heavenly minds feel when, at the end of term, they think themselves undeservedly beaten?

Further, it is argued that the pursuit of reward is a most deteriorating motive; it affects the character, and may make the boy apprise everything that he does by the one test of whether it pays or not. There is nothing so detrimental to the higher character as the constant comparing of the relative productiveness of different pursuits. Is not, it may be asked, the aim of a liberal education to make the higher and unselfish motives dwarf the lower and mercantile ones, and does not the whole prize-and-mark system tend to stamp the character for life with the very impress which the education was to render impossible?

Hence it is that some headmasters, or perhaps more often headmistresses, and most often the heads of independent schools, have declared that they would not have the sin of Achan in their tents. There should be no prizes, no rewards, no malicious rivalry, no temptation to possible unfairness in their schools. And these are often the best men and women in the profession; they are perhaps born teachers, and certainly born enthusiasts; with them what would be impossible with others may be possible: in working under them, as Mr. Sidgwick says, the pupils may "feel the honour and the delight of contact with large knowledge and eager interest and strenuous energy";¹ and such men and women may remove mountains.

But leaders and teachers of this stamp are few. One swallow does not make a summer, and one born teacher on a staff (and blessed above all is that staff that possesses one) does not make that possible throughout the forms which is possible in the one lucky class-room.

It is necessary to come down from the heights and to legislate for the ordinary class-teacher and the ordinary school-child. It is therefore seriously to be considered whether any system absolutely without rewards is practically possible; and if not, what form of rewards, while assisting in rousing to action the less willing scholars, is least detrimental to the willing learners, who need no mercenary motive to make them give of their best in exchange for his own best which the teacher freely lavishes on them.

Some differences may be noticed between rewards themselves. There are prizes, for instance, of real value, money or valuable books; while others have no more marketable value than the crown of parsley leaves. Again, prizes may differ in the area from which the competitors come; a wider competition may rouse other motives than mere self-seeking and there may be something of

the *vivre pour l'autrui* engendered where at first sight selfishness may seem to be the natural outcome.

First, as to the value of the prize: there would appear to be much less harm to be done by the prize which has no intrinsic value, the crown of leaves, or its modern equivalent, the card of honour, or the name upon the wall, than by the pile of books or the five-pound note. And yet, as far as a long experience goes, as boy and master, I should not judge that the value of the prize has much attraction to the candidates. It is the keenness of the struggle, not the money, that commands respect. I remember a certain surfeit of Greek Testament prizes at my college for which there used then to be very little competition, and there was a sort of shame (I remember feeling it myself) when perhaps one night's reading won a set of gorgeous volumes. Boys as well as men see very quickly that it is not the number of the scalps that the brave hangs up in his wigwam that is the real glory, but the greatness of the men whose scalps they once were.

The bookshelf laden with school and college prizes is as nothing in the life's memory as compared with the headship of a great school or the *proxime accessit* to a university prize. The real value of a prize is what it puts upon the record; the winner knows he has been tested and not found wanting; he may have thought that he had power, but it was his own thought or his people's thought; now it has been vouched for by an outside judgment, and he will no longer doubt himself. Or again, the failure may have proved to the boy the showiness, the inaccuracy, of his own brilliancy; it may have bid him go back and begin again on surer lines. I do not see how any justifiable confidence in a boy's own powers can be won except by the measuring of himself with his fellows.

The master of a small school who has perhaps one boy with real classical or mathematical ability knows how hard it is to deal with this ragged edge of excellence at the top of his school. Either the boy thinks too much of himself, because the big prizes fall to him without an effort, or he does not get the self-confidence that the trial with others his equals would have given. Surely it is in the close competition day by day that the larger schools have so much advantage over the small ones, and the prizes are the mere published notices of these contests.

While thus the arguments weigh in favour of some prize system, the large number that are offered very often defeats the very object intended. Once the prize becomes too common, it ceases to be a distinction at all. We all know the case of the school with five-and-twenty, where a great parade of justice is made that no boy is to deprive his neighbours of a second prize; and by this simple expedient the twenty-five prizes are spread over the whole school; and every parent goes home with the comforting assurance that his boy is a genius. And this is not only the sin of the private school; there are public schools where,

¹ "On Stimulus," by A. Sidgwick, p. 64.

to quote from *Punch*, it is thought very hard if every tiger does not get its Christian.

The prize list should be annually weeded out, and those prizes that do not bring out a real effort in which the competitors are, in racing language, "fully extended," struck out of the list. The shades of pious founders of out-of-date prizes will, I hope, forgive me. There are, again, some prizes which cannot be lightly disregarded, because they are sufficiently large to appreciably affect the recipient's life; sufficiently large to be, in fact, small scholarships. A needy lad looking forward to a struggle at the university may, by choosing such books as he will afterwards want, materially ease that struggle. This case, then, is removed into the ethics of scholarships, which is foreign to the subject of the present paper.

We have discussed difference of value; let us consider next the possible difference in the competitors' aims. Once enlarge the area of competition and an entirely different colouring is given to it. To turn again to the Greek games, it is no longer Hippocles in rivalry with Xenocrates, it is Syracuse against Agrigentum. To put an end to all competitions would be to strike a blow at school patriotism: to win the distinction of a blue riband for the school, or even for the house, may be a stronger motive than self-aggrandisement. Sooner or later, the temptation to regard nothing but self-interested motives will be forced upon all in the struggle for existence in after life: is it not strengthening the character instead of weakening it to encourage personal exertion for the sake of others? There are no doubt many ways in which the lesson may be inculcated that it is the duty of each to work for the good of all; but there is none that appeals so naturally and so strongly to boys as the hope that by striving harder for himself he may win honour for all. The half-holiday won for the school is perhaps the keenest joy of the new scholar.

It will be admitted, then, that some forms of prize-giving are less injurious than others, that the motives stimulating the competitors may be mixed, and that in some cases the higher motives may preponderate; but all this does not amount to more than that the abolitionists exaggerate the evils of the system, and that under a wise régime these may be minimised. Is the original argument against the prize system really touched? A heaven-born teacher, we admitted at the outset, can do without it, and why not all?

The only answer is that in an ordinary school more harm is done by the growing apathy of the majority than by the purified enthusiasm of the few. To bid the average boy or girl work for the love of learning alone is a counsel of perfection. There is no royal road to make learning absolutely easy even for the most gifted, and the maieutic process in the hands of a Socrates is not always a pleasant one: for the ordinary mortal the path is thorny, and the impulse to learn dies out quickly if it is not strengthened by other motives. I have been admitted behind the scenes of a school

swayed by a chief of exceptional genius where there were no prizes, no examinations, and knowledge was in verity its own reward. As far as I could learn, a few girls worked themselves to death, for what were hygienic reasons in the scale with the supreme good? for them there was such a high voltage of intellectual stimulus that their wits were in danger of daily electrocution, while the rest looked on as they liked, unresponsive to the mental stimulus, and unconvicted of merely marking time.

After all, boys and girls can only be moved by the same motives as men and women: like their elders, they say to themselves, why should I take all this trouble? and either a sense of duty or a desire to succeed, or a mixture of the two, is the ordinary spring of action; and the winning a prize is but an outward and visible sign of this duty done or this success achieved.

Let me conclude with an experience of my own in which learning failed to be its own reward, and the injustice of which through a vista of nearly fifty years still rankles in my unregenerate soul. One day the present Dean of Westminster, then the Master of the Upper Fifth at Rugby, was scandalised at the profound ignorance of the form in modern history, and declared that before the end of term he would examine the form in a goodly portion of Robertson's "Charles the Fifth." I read, I abstracted, I have still the note book showing endless genealogies, but a scarlet fever epidemic intervened, and we were all sent home at a few hours' notice, and before next term came, the master had forgotten Charles the Fifth and all his works. I have tried to solace myself with self-approbation, but, as Browning says, "I miss my little human praise."

NATIONAL EDUCATION.¹

I.

IN this book, which is called a "symposium," there are many things said both wisely and soberly by symposiosophists some of whom at least have earned the right to a hearing, even in their cups; some things, on the other hand, suggest not Socrates but his less temperate comrades. And it must in honesty be added that the essays neither make up a "symposium," as the word is accepted, nor do they really carry us far towards a constructive scheme of National Education; they lack a real radiating centre and they are often inconsistent with each other. In the earliest symposia known to letters we are given the continuous talk of notable persons on a clearly understood topic, moderated, *linguis currentibus*, by one great

¹ "National Education" (a Symposium). Essays towards a Constructive Policy. Edited by Laurie Magnus, M.A. (Murray.) 7s. 6d. net. [The subjects dealt with in Mr. Magnus's book cover so wide a field that an adequate and impartial survey of them would be very difficult to obtain in a single review. We have, therefore, submitted the book to two reviewers—one whose sympathies are mainly with literary studies, the other more familiar with the scientific side of educational work. The two notices are entirely independent of one another, and they serve to show how various aspects of "National Education" appear when regarded from different points of view.—Editors, THE SCHOOL WORLD.]

speaker; later symposia are, in the degenerate modern way, written; but follow still one well defined line. In this present symposium contributors have chosen to deal with several distinct subjects of public interest touching mainly the organisation and administration of education; and they have apparently either all talked at once, or have delivered themselves of independent monologues over solitary wine-flasks. The accomplished editor, for his part, has commented, often very shrewdly, on his *convives*, alternately "sneezing approbation" on the right hand, and on the left quietly but flatly contradicting them. If the book is not a real symposium, still less does it deal in any truly complete and systematic way with national education. All the topics treated are, to be sure, of national importance, but for scientific handling of the question to what end and by what means the youth of this nation is to be trained we must go elsewhere. The editor is of opinion that "we"—and all of his contributors—know what it is we want. But beyond the common desire that our children may be better than their fathers, it would puzzle him, we imagine, to draw up a *credo* on this point to which subscription might be made by Mr. Storr, Sir J. G. Fitch, Mr. Eve, Professor Hewins, and himself, on the one hand, and Professor Armstrong on the other. It is precisely because we do not know what "we" want that Professor Armstrong so complacently denounces the universe explicitly and his boon companions by implication, seriously damaging a good cause. National education can be treated satisfactorily only as Fouillée has treated it, on a philosophical basis, or, to adapt the editor's own excellent words, from a conception "rigid enough at its centre to radiate an enlightened policy without waste or fluctuation, and wide enough in its circumference to include and to provide for all the educational needs which modern life has come to recognise." It is melancholy for an Englishman to compare the great Frenchman's firm and consistent reasoning with the odd mixture of insight and unphilosophical inconsequence which here now interest and now irritate us. And if the book's basis is in no true sense national, neither is the superstructure complete. For what is a discourse on national education which involves only rarely and inferentially the university? Is not this "very English" and very characteristic of our lack of *conspicuousness*? The fact is that as generally here treated education *could not* involve the highest and most disinterested studies; which one writer brusquely waves aside as designed for "the recluse."

But the editor is better than his plan. His opening chapter is really a well-reasoned allocution addressed *urbi et orbi*, as he sits alone after the dismissal of his rather mixed company, such as could have come only from an honest, though manifestly inexperienced, sense of the need, in this matter, of philosophising; and we hasten to add that his summing up of the situation is acute and often singularly just. It is true that to him the problem seems simpler than it is, and that he makes assertions for which he can have no manner of warrant—that, for instance, he lets us infer the

chief difficulty of curriculum to be some conflict between humanism and realism, and that he finds that "the average Etonian cannot write a decent English letter." But he is incontestably right in protesting against the thoroughly vulgar notion that education is something which you can give in doses to be raised in amount according as you prescribe for a higher social grade; and the root of the matter is in him when he pronounces for a liberal education all round, with its basis in Literature.

Apart from administrative matters, the most critical questions of to-day centre round the teaching of the positive sciences, a point on which (for a cat may look at a king) the reviewer feels possibly more strongly than Professor Armstrong. It has recently been discovered that the positive sciences can be crammed even more easily than other examinable "subjects"; and as a matter of fact no items of the whole hierarchy of studies have been so shamefully and wastefully treated as those under the particular patronage of the eminent men of South Kensington. From no subjects of school gymnastic have the methods of research and discovery been so conspicuously absent. And now, to cover the shame of the abashed parents of this ridiculous mouse, we are deluged with unjudicial abuse of the robust offspring of time and teaching.

Some hierophants of these mysteries, having at last become aware that ratiocination and vigilance are at least as necessary here as mastery of unconcatenated details, would have the world think that the discovery is theirs. Teachers may well be up in arms against such a baseless imputation of incompetence and imposture. Mr. Magnus is quite justified in calling Professor Armstrong's discourse "rousing." It is; for the Professor writes at the top of his voice. A reading of the quietly sustained argument of the editor himself and the genuine philosophy of a practical man like Professor Hewins is a very necessary discipline if one's faith in the educational value of the positive sciences is to survive Professor Armstrong's profoundly unhistorical and unphilosophical criticism. "Originally," says this authority, "education was provided solely for the recluse." What are we to think of that for a historical summing up of the mediæval and Renaissance education? As for the first, two facts stand out in its honour: that it was open to all who came, and that when a man passed in London or Paris or elsewhere as *Magister Artium*, he went out in the world with a certificate that he could do things; and he did. *Vixere fortes ante Agamemnona*; Dr. Armstrong would learn something about his predecessors by spending half-an-hour with Dr. Rashdall or Professor Laurie, or even Quick or Compayré. And for the Renaissance, it would interest him to read, say, the advice given to his practical son by the practical father of Sir Philip Sidney; and their age was certainly not an age of "recluses." The fact is that the writer is always tilting at imaginary foes, those whom he calls "the Humanists—the party in power." The teachers themselves are the anti-Christ of his educational system, for "the task is hopelessly beyond

the capacity of our present race of teachers." "The Humanists must be led to see that their work, however well done, will not suffice to a complete edifice. Indeed, in some respects, *the better it is done the more subtly undermining is its influence.*" There is scientific education for you! The "Humanists" (if that is their right name) must not return this dubious compliment. For them, the better the work in positive science is done, the more *humane* the result. The positive sciences are wanted because man, besides being the son of his ancestors, the heir of the traditions and achievements and ideas of the ages, has also to live *now*, and to make the best of his own present and widening circumstances. He stands isolated neither in Time nor in the Universe. The claims for the extension of logical method, the processes of discovery, into the teaching of the elements of positive sciences, and the inclusion of these elements in the school curriculum, are a great deal stronger than this indiscreet championing would give us to understand.

Prebendary Reynolds presents the case for Religious Teaching in Schools with the ease of long experience, but we cannot think that he has adequately realised the daily growing distrust of the dogmatic bases of current faiths. No morals pointed from the sad political and social effects of state irreligion will avail us; the most corrupt of the Anti-Dreyfusards were the most "religious" people of France. Nor are church schools the safest depositories of even scripture teaching. An Inspector of our acquaintance recently told us that he read in the log-book of a church school the following legend: *Wishing to give the boys some unseen reading this morning, we used the Bible.* Sir Joshua Fitch always writes like a philosopher; and his ripe knowledge is here profitably used in advising on the state inspection of secondary schools. He would rightly have the inspection so conducted as mainly to ensure the wise use of freedom on the part of the managers. Perhaps, as an honoured ex-official, he will one day hazard an explanation of the fact that the "secondary" branch of the Board of Education has been jealously constituted out of that section of its staff which knows least of secondary education, either from personal antecedents or subsequent experience. Mr. Storr on the Registration of Teachers deals with a topic to which he has devoted long and careful attention. He is a thoroughly trustworthy guide on the question of training, even against so accomplished an advocate as the late E. E. Bowen of what has been wittily called the "heuristic" method of training teachers by letting the hapless wretches travel the path of discovery alone. Himself an accomplished teacher and the champion of teachers, he deserves a most respectful hearing, even from those who think, as the reviewer thinks, that he allows less weight than he should to economic influences. Professor Hewins' article is one of the best in the book. It is an entirely reasonable demand for the scientific treatment of a subject of higher education based on a good sound general training; it presents the case for "humanism" in commerce; there is no "prigishness of ignorance" about *him*. Mr. Eve is less

concerned with administration than with curriculum and class procedure, and, like Mr. Storr, *εὐδῶς λέγει*. The chief point of his recommendations is the combination of the older scholarly "heuristic" in the teaching of modern languages with the impressionism that is more generally preached to-day. We are all agreed that for the bulk of our boys and girls the modern languages must needs take the place of the Latin and Greek classics; the pressing problem is to give facility at the same time as profitable ratiocinative and rhetorical gymnastic.

JUDEX

II.

MR. LAURIE MAGNUS is to be warmly congratulated on the success of his volume of essays on National Education. On the whole, he has been wise in his selection of writers, all of whom are qualified to speak with considerable authority on the various aspects of national education with which they have had to deal. As a rule, the great fault of volumes of essays, dealing with different phases of a common subject, is that there is a lack of convergence towards a definite purpose. In this book, however, the editor has been at work, and it is evident that there has been, where necessary, an interchange of papers between different authors, and thus overlapping, and other evils, have to a large extent been avoided. This is especially noticeable in the group of essays dealing with industrial needs, and secondary and university commercial education.

The subject of Church schools and religious education is treated with great ability and moderation, and, as the time is at hand when this will again be made the battle ground of a fierce political controversy, it is well to have such a clear and reasonable statement of the claims of voluntary schools.

Mr. Francis Storr deals with the registration and training of teachers. It seems a little late in the day to argue solemnly whether training is or is not necessary for all classes of teachers. There has been such a complete revulsion of feeling with regard to this of recent years that the anti-training school has practically disappeared, and the regulations for the registration of teachers will surely dispose of any opposition that survives. Mr. Storr does well to insist on post-graduate training for secondary teachers; but why not elementary teachers as well? The sooner the distinction between the pedagogic qualifications of those fit to teach in elementary schools and those fit to teach in secondary schools disappears the better. The division has done untold harm in the past, and is as absurd as is the custom of putting inferior teachers in charge of the lower forms of a school. Academic, not pedagogic, qualifications must be the basis of separation, if separation there is to be.

With legislation promised in the near future in connection with the organisation of secondary education, inspection of secondary schools becomes a matter of some importance. Sir Joshua Fitch

deals with this subject with that wealth of knowledge and liberality of view which always characterise his treatment of educational questions. He sums up the objects to be aimed at in the inspection of secondary and higher schools as follows:—

(1) To ascertain the educational status and the actual work of all schools claiming recognition as integral parts of a national system of secondary instruction.

(2) To furnish suggestion and guidance as to the maintenance of a high standard of excellence.

(3) To secure large freedom and elasticity to the promoters and teachers of schools, and to recognise all forms of good work.

In the majority of the essays in this volume the traditional line is generally taken—history, progress, needed reforms, suggestions. With Prof. Armstrong's contribution on science and education—the need of practical studies—it is different. Here we have the demand of the reformer for radical changes all along the line. The education of children in large classes with no possibility of considering the personal equation of the child; the separation of subjects of instruction into water-tight compartments; the artificial atmosphere of the school; the want of a proper relation between school life and the life before and after; the training of teachers, and many other subjects, come under review, and are treated with characteristic vigour and ability. Among much that is destructive, the more excellent way is pointed out in suggestive indications of a constructive policy; but, generally, only in broad outline. As an example of this we may quote the following:—

“Many of the faults inherent in the present system would soon disappear if the instruction generally were centred around the study of some problem or inquiry—if, in fact, it were largely to hinge upon the work in experimental science—if what may be termed the workshop system as opposed to the class system were adopted, and if the pupils were called on to execute a series of tasks involving the practice in due measure of all the various ‘arts’ contributing to education.”

If Prof. Armstrong had gone further and mapped out even in the crudest manner an illustrative curriculum, with experimental science as the concentration centre, say for a child of twelve years of age, it would have been extremely interesting, and would have afforded a good basis for experiment on what is in itself a perfectly reasonable suggestion. The more educational experiments we have, provided they are rational, the better it will be. Experimental schools are as necessary in education as experimental farms in agriculture.

The essay on industrial needs by Mr. Provand, that on commercial education (secondary) by Mr. Organ, and that on commercial education (university) by Prof. Hewins, deal with three aspects of the same question. It has become customary on the platform and in the Press to take a somewhat hysterically pessimistic view of the present position and prospects of Great Britain in in-

dustrial warfare. These essays contain no trace of hysteria. They deal calmly, deliberately, and ruthlessly with our national shortcomings in the direction of industrial equipment: they destroy many of our popular misconceptions, and point out unmistakably the way of progress. The intimate association of the efficiency of its educational system with the commercial prosperity of a nation has now become apparent to all but the most decadent of obscurantists. What constitutes efficiency in any particular case, however, is a matter for serious discussion. Nothing is more fatal to progress in this connection than early specialisation. A careful examination of the systems which have proved most productive shows clearly that the sound secondary education which develops the all-round intelligence of a boy or girl before the acquisition of the technical knowledge required for any special department produces the best result. It has proved a grave misfortune that the organisation of secondary education in England did not precede the Technical Instruction and Local Taxation (Customs and Excise) Acts. Technical knowledge, especially that of a more advanced character, is of little value without a good secondary education as a foundation to build upon. This is referred to again and again in the essays under consideration. Much, however, is being done. The great attention given to special courses of commercial instruction, the marked improvement in the teaching of modern languages, the institution of a faculty of what is practically commercial science in the University of London, the phenomenal success of the London School of Economics, all point in the right direction. The classification of commercial workers into groups, and the proper treatment from an educational point of view of each group, is discussed in some detail by Mr. Organ, and many valuable suggestions are made.

In Agricultural Education Mr. Medd has a clear field, and he deals with the subject in a thoroughly comprehensive and scholarly manner. The history of what has been done in the development of suitable curricula in special agricultural schools and colleges in those countries in which the competition in agricultural produce is most severe is far more valuable than similar information in other departments, because in the discussion of the general principles underlying courses of instruction the same arguments must necessarily apply in all countries. It is very evident that some of the successful educational experiments carried on in France and Denmark might with advantage be adopted in England.

The story of the effect of the application of public funds to technical instruction in country districts during the past ten years is very interesting and speaks well for the industry and intelligence of the Technical Education Committees. The proper function of each grade of school necessary to produce a satisfactory scheme of agricultural education, primary, secondary and university, is fully discussed, and a useful summary is given of much needed reforms. With liberal endowment

the experience already gained could be utilised in the development of far-reaching changes the importance of which it would be impossible to over-estimate.

In the last essay in this interesting volume Mr. Eve discusses improved methods of modern-language teaching. At a time when the retention of Latin as a compulsory subject in the matriculation examination of the University of London is under discussion, the following statement from such an authority as Mr. Eve is of considerable value:—"To sum up, then, there is reason to believe that we have in modern languages an instrument of liberal education at least comparable to the classics. The results to be expected are, in all probability, inferior to those of a complete classical education, which it is necessary to point out again and again, is accessible only to the few. On the other hand, it is easier to obtain respectable proficiency in modern languages in a shorter time, and in that respect they have a distinct advantage over the incomplete training in a single ancient language which is the staple of a great deal of our secondary education."

We strongly recommend this book to all interested in educational reform, to the literature of which it is a valuable contribution.

C. W. K.

THE STUDY OF PHILOSOPHY.¹

DR. MERCIER'S book is a very important contribution, both in size and value, to comparative psychology. The author claims, and claims with apparent justice, "The disorders of mind have never before been systematically examined, arranged and correlated with the normal types from which they erringly depart, and if the result displays a certain crudity, it may be alleged in excuse that the axe of the pioneers cannot have such a finished result as the plane and the sandpaper of the subsequent investigation." The author deals with Sensation, Thought, Volition, Memory, Pleasure and Pain, Subject Consciousness. In each of these subjects he gives a statement and rationale of his views of normal psychology. In each case he brings into full discussion the "faults." Thus he treats fully of the Faults of Thinking, Syncrisis, Axiomatic Reasoning, Analogy, Proportional Inference, Immediate Inference; Faults of Belief, Faults of Volition, Attention, Effort, Instruction, Determination, Acquired Determination; Faults of Memory, of Pleasure and Pain, Disorder of the Subject-Consciousness. In all the treatment of morbid psycho-

logy, Dr. Mercier shines with conspicuous knowledge, and this book is distinctly a remarkable contribution. Its value from the point of view of instruction is chiefly indirect, but a reference to the above subjects shows that it is of real importance. Perhaps the chapter which strikes the educational reader with particular interest in its content is the exhibition of the different sides of Memory, as Structural, Dynamic, Active, Conscious Memory—together with the psychology of the process of Remembering. Such a classification gives considerable scope to the specialist in the enumeration of faults of memory. The treatment of Will and its defects has great interest for the educationist. The teacher is more likely to have noticed faults of thought, but the comprehensive treatment of the subject in this book will probably surprise even the teacher. There is, however, it should be stated, little if any reference in this large work to child-psychology.

Professor Mary Whiton Calkins's book contains a first course in Psychology. It is the result of practical experience. It is grounded largely on Professor William James and Professor Münsterberg's teaching—and is influenced by the physiological works of Külpe, Titchener, Ward, Stuart, Brentano, and Flechsig. The writer also acknowledges indebtedness of criticism from Professor E. C. Sanford. The first book is divided into two parts, viz: The Structural Elements of Consciousness, and Concrete Conscious Experiences. The former position deals with sensations, extensity, attribution, elements of consciousness, and relational elements of unconsciousness and attention. All these subjects are then treated from the analytic point of view, including physiological and psycho-physical aspects, the mode of treatment characteristic of the new school of psychologists. Having finished this "post-mortem" study, the writer then deals with conscious states "as they are concretely given to us," first without reference to any self; and secondly, as relation of a self to other selves. It is in the latter method of treatment that the book shows considerable distinction in comparison with many of our psychological text-books, and in this respect will probably attract the attention of students of the subject. It brings to bear a synthetic treatment which has been a distinct lack in the ordinary text-books. The second book deals with Comparative Psychology and Abnormal Psychology. There is a distinctly good chapter on Child-psychology, which makes the reader wish for a further treatment. The bibliography at the end of this volume, though it is offered apologetically, is particularly valuable in its account of recent works (since 1890). Altogether the impression given from the book is that students under Miss Calkins's care have a remarkable, interesting course, and that lecturers on the subject will do well to study both the topics dealt with by her in the book, and the method of treatment. For Miss Calkins's illustrations, both scientific and literary, give a charm and piquancy to the subject, and her style is clear and suggestive, and especially has that American feature of

¹ "Psychology, Normal and Morbid." By Charles A. Mercier. 518 pp. (Swan Sonnenschein.) 15s.
 "Introduction to Psychology." By Mary W. Calkins. 509 pp. (Macmillan.) 8s. 6d. net.
 "The Ethical Philosophy of Sidgwick." By F. H. Hayward. 275 pp. (Swan Sonnenschein.) 4s. 6d.
 "A Student's History of Philosophy." By Arthur Kenyon Rogers. 519 pp. (Macmillan.) 8s. 6d. net.

"aliveness." The freshness and spontaneity of some of the work are an interesting contrast to the dependence shown in other parts on recognised authorities. They render the book unequal in value; but there will be few readers of psychological works who will not find some portions of real interest and stimulus.

Dr. Hayward's critical account of Dr. Sidgwick's "Methods of Ethics" is substantially the dissertation which he presented to the University of Cambridge as an "Advanced Student." Sidgwick's "Methods of Ethics" requires advocacy as a work which is often not given a sufficient trial by the student of ethics. By disciples of the Idealistic school, too, the writer thinks Sidgwick's first work is unduly neglected. Yet he thinks "there is no idealistic work in existence which will bear comparison with the non-idealistic *Methods* as a propaedeutic to the subject of ethics." Dr. Hayward gives valuable introductory hints to students. There is a comprehensive bibliography. The work is throughout suggestive, and will be very useful, particularly in its numerous references to contemporary ethical writers bearing on Sidgwick's positions.

Dr. Rogers has written an interesting sketch of the history of philosophy. Confessedly, no attempt is made to trace the more technical lines of influence from one philosopher to another, as "they are almost impossible for the student to grasp." Surely it is here, however, that the student most wishes for help. Dr. Rogers, then, can make his book interesting by giving the main features of the philosophical ideas of individual thinkers, and by choosing, occasionally, passages of literary interest, as well as those more distinctly philosophical, for illustration. But much of the philosophical discipline is thereby lost. Dr. Rogers has attempted, he states, to relate philosophical ideas to the more general history of civilisation, through "the medium of a somewhat mild introduction of the Hegelian philosophy of history." This twofold method of treatment may have its advantages in the lecture-room, where the student is sent to the original works discussed and books of reference as to the history of civilisation. But it leads to a lack of proportion in a manual, and may even be confusing. We can easily understand that a book like Windelband's "History of Philosophy" is difficult for the unpractised student, and can readily believe that a bright, fresh, vigorous elementary treatise, on Windelband's lines—treating rather of the history and development of philosophical ideas and tendencies in their relation to general culture developments—would be of the highest value to younger students, but we fear Dr. Rogers has kept too many aims before himself, so that his book lacks that unity of conception, method and material, which makes a text-book classical. But whilst we feel more drawn to a history of philosophy which takes a single and unified intrinsic interest in the ideas and problems of philosophy rather than a series of monographs on individual philosophers or systems, we recognise, as we

have said, that Dr. Rogers has by his selectiveness, and warmth and vigour of expression, written an interesting book which gives general information on philosophical history which is distinctly readable and attractive.

THE CHOEPHORI OF AESCHYLUS.¹

THE model for this edition has been clearly Jebb's "Sophocles." Mr. Tucker has done everything for his author that can be done, by criticism, commentary, and translation. The teacher may, perhaps, be pardoned for a passing regret that nothing is left for him to do except to select what he thinks fit from Mr. Tucker. Yet it is well that the work should be done, and we can find little but praise for the way in which Mr. Tucker has done it. Our chief criticisms would be two: that he is a trifle diffuse in his Introduction and Commentary, and that the Translation is full of scraps of blank verse. The latter is a fault astonishingly common; strange that a student of fine literature does not realise how bad a fault it is.

In the first place, we are glad to find that Mr. Tucker is conservative. The discoveries of the last generation have nearly all tended to confirm the authority of good MSS., and by degrees our texts are getting rid of the innumerable conjectures which they used to contain. Aeschylus, in particular, has suffered in this respect, for editors have not realised his ruggedness, both natural and intentional, and they have attempted to make plain syntax even out of the disjointed phrases of a nurse or the gasps of the frenzied. Where Mr. Tucker has departed from the MS. he has always kept in view the *ductus literarum*, and his own conjectures are for that reason generally more probable than others, although they are sometimes bold. Thus, in 415, for *φανείσθαι καλῶς*, which is neither sense nor metre, he reads *φανίσει*, a word not indeed actually found, but abundantly justified by analogy. If this be wrong, it is yet better than *φαίνεσθαι καλά* or *φροντίσει καλά*. In 496, *λαβᾶς* for *βλάβας* is distinctly happy. He has some judicious remarks on the *Scholía* as aids to the text, and shows how often they have been misunderstood. The illustrative commentary is very full, and suggests a number of new interpretations. Here he is sometimes indebted to Verrall, but he is more cautious and sure than his brilliant predecessor. His interpretation of the *Commos* as a magical charm to arouse the spirit of the dead to revenge throws light on a number of details; particularly the verses which imply a beating upon the earth with hands and feet. Sometimes he appears to be over-subtile; as when he translates 249:

οὐ γὰρ ἐντελής,
θήρα πατρῶα προσφέρειν σκηνήμασιν

¹ "The Choephoroi of Aeschylus." With Critical Notes, Commentary, Translation and a Recension of the Scholia. By T. G. Tucker, Litt. D. civ. + 318 pp. (Cambridge University Press.) 12s. 6d.

"since their chase hath not the full-grown strength to bring their father's quarry home to the nest." And yet it is not easy to suggest anything better, and he may be right. His scholarship is good; he recognises, although neither he nor another have worked it out to its full consequences, that a construction (e.g., accusative one) may depend on a whole phrase and not be attached to any one word (23.) But he is loose in his regard of *γ* (24 *crit. n.*), which is by no means a simple particle of emphasis. The Introduction is peculiarly happy on its dramatic side, and triumphantly vindicates the scene of recognition from unreality or affectation. This argument is then brought to bear on the criticism of the scene which appears in the *Electra* of Euripides, and used to show that the lines in question could not have been written by Euripides. We do not always agree with Mr. Tucker's stage business (for example, on p. xlv.), but the criticism is always judicious. Scholars will also find the classification of textual errors useful. We should have liked to treat all these points with fulness, but enough has been said to show that, in spite of a few faults, this is an excellent book; it will certainly be the standard edition of the *Choephoroi* for a long time to come.

TWO SCHOOL HISTORIES.¹

THE number of school histories of England increases. And while the controversy continues as to the ideal text-book, we suppose it will still increase. The latest contributions come to us from various directions. One is from an honoured professor of St. Andrews whose name is a household word among teachers, the other is written by lady professors of Wellesley College in the United States of America, already known to our readers for source books, &c. The story told in each book is of course similar in the main. Professor Meiklejohn and his collaborator give us clear, if not good-looking, maps and a vocabulary of historical terms. The story is told in a plain, business-like style, with many improvements in form of expression. Specially useful is the treatment of the foreign history of the 18th century. But the constitutional history is treated too slightly and the ecclesiastical differences of the seventeenth century are relegated to the background. The maps in the American book are coloured and there is an abundance of pictorial illustrations, which are of various merit, most of them being very good. The story is clearly if shortly told, and colonial history is naturally better treated than in the average text-book. In some respects, the book is out of proportion. Eighteen pages bring us down to Alfred from prehistoric times, while four-

teen are given to his career, and nine to the Peasants' Revolt of 1381.

We have coupled together these two books in order to draw attention to the principles of teaching expounded in their respective prefaces. We have hitherto been accustomed to believe, and to practice that belief in the schoolroom, that the memories of children are stronger than their understandings, especially that the verbal memory has powers at an early age which it afterwards loses, and that therefore, while we are interesting our pupils with stories, more or less authenticated, they are also absorbing into their mental receptacles for *future* use such things as lists of kings and dates.

But now we have, on the one hand, Professor Meiklejohn, and on the other our American authors, proclaiming that "it is unnecessary to load the memory of a boy or girl with dates," that therefore "few dates have been given, but it is hoped that the student may nevertheless gain a true impression of the order of events." Professor Meiklejohn speaks of "detail" that is "often useless and generally dry," and makes his aim to guide his readers only "over the most interesting and fruitful parts of the historical country," while our American lady professors have made "efforts to render the book attractive to young people by laying stress on the personal element in history," and place in their margins references not to larger manuals or source books, but "to imaginative literature . . . poems, dramas and tales." We are not surprised at the advocacy of such views in America. From all we can learn of our trans-Atlantic cousins and their children, we imagine there is (unfortunately, in our opinion) much need to treat their young students as Miss Kilmansegg was treated in Tom Hood's famous poem, but when we have such high authorities on this side the ocean as is our Scottish professor also advocating "pleasant" ways of learning, we think it time to speak out on the opposite side. Is history, after all, a serious study, or is it not? Are its annals to be learnt, as languages and mathematics are learnt, with a view to training the mind and storing it with material for future guidance in life, or are they merely to be explored to furnish our children with pleasant week-day afternoons under the *name* of school-lessons? We believe it possible to teach the history of our country, which surely is a serious history with very real results, in a way which is within the capacity of children "from fourteen to sixteen" (the age for which Professor Meiklejohn's book is designed). That way is not by ignoring the difficulties and slurring over the "dry" details, but by telling the story in its fulness in language adapted to their understandings. We are still waiting for the text-book which shall expound the Norman constitution, the Angevin juries, the Magna Carta and the beginnings of Parliament, which shall not shrink from giving the story of Puritanism and the main outlines of the growth and loss of our first empire, and which shall thus, in simple language, tell our children why we are what we are to-day.

¹ "A School History of England." By J. M. D. and M. J. C. Meiklejohn. ix. + 470 pp. (Holden.) 2s 6d.
"A Short History of England for School use." By K. Coman and E. Kendall. xxviii. + 424 + v. pp. (The Macmillan Co.) 5s.

THE TEACHING OF ELEMENTARY MATHEMATICS.¹

By G. M. MINCHIN, M.A., F.R.S.

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THE main question that we have to discuss relates to the order and method which should be adopted in the teaching of mathematics. There are, I think, two essentially distinct ways in which mathematics may be regarded—

- (1) As a fine art.
- (2) As a means of investigation.

Under the first head it might also be regarded as an *exercise in logic*; and under the second we must not restrict the field of its application to the strictly practical needs of men (such as bridge-building): we include also the discovery of a new planet.

I think that I am right in saying that in our schools mathematics is regarded chiefly under the first head; it is praised as a *good mental training*. In some of the Universities, also, it is regarded and treated chiefly from this point of view. Cambridge has, I think, always been an exception. Cambridge has never, so far as I have observed, strained after short proofs or elegant methods. The man who devotes his energy to the discovery of short cuts to things which have been already discovered by someone else, and who makes mathematical elegance his great aim, is sure to be left far behind on the road of discovery. There is no power, no principle of progress, in such fine art as this. It would never have led to the electromagnetic theory of light—and Cambridge was wise in neglecting it.

Now the particular branch of mathematics with which, far more than with any other, we are concerned in the teaching of the young is geometry, because it is certainly the most difficult, it consumes an enormous amount of time, and it forms the best exercise in logical arrangement. We in England have based the teaching of geometry on Euclid's book. We have done more: we have inculcated the most strict adherence to the definitions, the axioms, and the sequence of deduction in the first six books of Euclid. Further than this in the way of devotion it would be difficult to go.

We are afraid to allow boys to deviate from the precise language of Euclid, or to assume any new axiom—even when it relates to something forced upon us by our senses—lest we should encourage loose language or an illogical order of thought. But let me call your attention to one hard fact—namely, that with all her devotion to the severely logical form of Euclid, and the almost boundless pains which she has taken to drill her boys in the very precise language which is considered such an unrivalled mental discipline, England has never produced a geometer of the first rank. For great geometers we have to go to the country of Poncelet and Chasles; and for clear logical writers, too, we must look to France and not to England, notwithstanding the fact that Euclid's system is not the basis of instruction in France.

This fact alone should suffice to show our schoolmasters that it is vain to contend for the retention of Euclid in our schools in the face of experience which shows that boys cannot master three of its books without spending about five years in the attempt, and that many never succeed in the attempt at all.

On one point testimony is almost universal—that boys find Euclid extremely difficult. I have met one or two mature people, of no particular attainments in mathematics, who have assured me that they never felt any difficulty in learning Euclid; one friend, in particular, who certainly has not a single geometrical notion in his head, has told me that he

always had a great admiration for Euclid—*omne ignotum pro mirifico*.

It appears to me that the controversy between those who are in favour of reform in our public-school education and those who are conservative of the existing system is really a contest between those whose object is to *push on* in scientific knowledge for the purpose of saving time and reaching more rapidly than we now do the useful applications of mathematics, and those who wish to use mathematics merely as a kind of mental gymnastics, or severe logical discipline without any utilitarian considerations whatsoever. This latter class—the vast majority at present—are by no means disquieted by the fact that the schoolboy who begins his Euclid at the age of nine and spends five years in a preparatory school finds himself at the age of fourteen, when seeking admission to a public school, a more or less imperfect master of the text of Euclid's first three books, unused to the sight of rule, compass, or protractor. And yet, if you seriously consider this matter, you must see that this is a shocking waste of time. The amount of geometrical knowledge covered by these three books is not great; if conveyed in simpler form to an averagely intelligent boy, the whole of it could be mastered in a year; but when it must be assimilated in the precise and peculiar order and language of Euclid in the few hours which can be spared from Greek and Latin, it is not surprising that we have a deplorable result.

But the practical question for those who have to teach geometry in the schools is—What is to be done? The first thing that I would advise is to assist in procuring a work on geometry drawn up by adequate educational authority, proceeding by a simple and natural order of treatment, this work to be the recognised standard at all our public examinations. We were asked at the British Association the question—if Euclid is got rid of, what can we put in its place? The implication is that it would be impossible to put anything in its place; but the fact that no continental nation adopts Euclid is a sufficient answer to that.

I think that the matter should be taken up either by the Universities or by the British Association. In the meantime, however, as we have to deal with existing facts, we should introduce as much common sense into the teaching of Euclid as possible, and in this connection I would make a few special remarks:

(a) Avoid a straining after absolute accuracy in all definitions. Recognise the fact that some things cannot be accurately defined—they can be only more or less adequately *described*. Take, for example, the very first definition in Euclid: "A point is that which has no parts," which some people imagine that they have clothed with strict logic in the variation, "a point is that which has *position* but no magnitude"—in other words, "an archdeacon is one who performs archidiaconal functions." It is far more helpful to a boy to tell him that a point is a mark made in a sheet of paper by the end of a needle. Apart from actual sensuous intuition in space, Euclid's definition has no meaning; while the "improvement" upon it is, if possible, worse. Again, Euclid's definition of a right line is a palpable fraud: "a right line is that which lies *evenly* between its extreme points." You will save a great deal of trouble at once if you boldly tell a boy that "a right line is the shortest distance between two points." He knows, just as well as you, what you mean by a right line, and it is mere waste of time to try to invent a definition which involves no assumption and no innate idea. In connection with this straining after perfection of logical form, I may mention some propositions in the third book—such as that a chord of a circle lies wholly inside the circle—which unnecessarily ignore the fact that we have eyes.

(b) Let the teaching of Euclid be always accompanied by the

¹ Abridged from a paper read by the author before the Association of Principals and Lecturers in Training Colleges under Government.

use of instruments. In particular, let the circular protractor be used at the very outset, because it is only by means of it that the beginner can get the notion of angular magnitude. I doubt very much if anyone ever got his correct or final notion of an angle from Euclid's definition: "An angle is the *inclination* of two right lines to each other." I have heard people say that we should make *bad* figures for beginners in order that their logic should derive no assistance from eyesight. I would, on the contrary, insist on the frequent use of compass, protractor, and parallel rulers until the beginner learns to recognise what good figures really are, and then he will pay some regard to propriety when drawing them freehand himself.

Again, some people would teach geometry (Euclid) quite apart from all algebraic and arithmetical illustration, on the ground that the conception of geometrical magnitude—length, area, or volume—is something quite distinct from number. In this system the perception of the equality of two areas must be conceived as resting on some system of possible superposition, and must be kept mentally distinct from all notion of arithmetical product. I had lately to examine an edition of Euclid in which the editors apologised for using such an expression as AB^2 to signify the square described on AB ; and the expression, AB, CD , to signify the rectangle determined by the lines AB and CD . They made a most emphatic disclaimer of any arithmetical notions in using these symbols; and they held that the moment a learner began to identify them with the operations of arithmetic or algebra the notations should be abandoned. I could not help being reminded of the apparently earnest disclaimer of any belief in the earth's motion made, in their preface, by the two learned Jesuits who edited—and edited well—Newton's *Principia*.

I hold that accurate measurement and arithmetical illustration should be almost incessantly made use of in teaching geometry to the young. The eye and the judgment should be trained and accurately formed by good figures and arithmetical calculation and measurement. When the beginner has been made familiar with angular magnitude by actually using the circular protractor, he should be asked to guess, or estimate by eye, the angle between two lines drawn at random, and then to measure the angle and see how near he was to the truth. I have tried this method with a boy of little over eight years with rapid and most pleasing success. I was never taught in this way myself: I got nothing but Euclid's barren definition of an angle, with the result I never got a real notion of angular magnitude until I was done with the six books of Euclid and took to trigonometry.

(i) In teaching geometry I would not make the pupil begin with a catalogue of definitions. This wearisome process is, I believe, the one usually adopted in our school Euclids. It is calculated to kill a boy's interest *in limine*. How could it be otherwise? A catalogue of definitions will necessarily contain things which are not wanted in the study of the subject until the pupil has advanced perhaps very far; and the purpose of such things must remain hidden from him until he reaches the point at which these definitions are required. Teach your definitions as they are wanted. The straining after absolute precision and immaculate definition in some school Euclids that I have seen is most marvellous.

Besides over-precision and over-definition, there is also the fault of over-systematisation in the teaching of geometry. Thus, in our school books it is not uncommon to find even the most simple proposition in Euclid—a proposition that would scarcely be accorded the honour of separate recognition in a reasonable system of geometry—chopped up under a multiplicity of heads: *general enunciation, particular enunciation, hypothesis, to prove, proof, conclusion*; and occupying, of course, a ridiculous length.

In the teaching of Euclid—if we must teach Euclid—there is one thing which I should recommend for adoption in order to correct the bad effect of the very mechanical process by which the propositions are committed to memory. When each proposition has been apparently learnt, I should require the pupil to give me the *main* points in the proof in his own—not Euclid's—words, omitting all the minor details.

As regards the teacher himself, I believe that the power which is most conducive to his success is that of placing himself exactly at the point of view of the pupil in any question which is a source of difficulty. The writers of almost all English scientific books—particularly those on applied mathematics and physics—seem to me to ignore the cardinal fact that more than one-half of effective teaching consists in removing difficulties and objections that are almost certain to present themselves to the mind of even an intelligent student. I have often found myself that the removal of one difficulty or objection that has occurred to me in studying some mathematical or physical subject has sufficed to carry me with ease over a large domain of knowledge. This process of putting myself mentally in the place of the student to whom I am explaining something in hydrostatics or the kinetics of rigid bodies, and of raising for him an objection which I invite him to answer—an objection which would almost certainly be raised by himself at some future time when, perhaps, there was no one near to help him—is one which I employ several times in the course of very nearly every lecture that I give. The teacher of any class of students—unless it should be one composed of Senior Wranglers—who does not adopt this questioning, Socratic, method is very likely to flatter himself that he is getting on most successfully with his work, when, in truth, the knowledge which he has planted has taken no root whatever, and proves to be a mere decaying plant.

It is a great fallacy in teaching, whether in a book or on a blackboard, to think that all you have to do is to promulgate a succession of truths. The knowledge of the pupil is not sound or healthy unless it has been exercised and tried by the assaults of objection.

I have said that we must introduce as much common sense as possible into our mathematical teaching. Try to test as many results as possible by the application of common sense. Every teacher of mathematics knows that his pupils often appeal against him to common sense, when he presents some queer or paradoxical result. Let it be your business to go with them before this Cæsar, and do not let them off until you have thoroughly convinced them that it is *you* who have common sense on your side, while *they* had merely a mistaken, if plausible, rule of thumb.

I have dwelt at great length on the particular subject of Euclid in this discussion, because I am convinced that Euclid is the great time-waster in our school teaching. And I would ask two plain questions with regard to the teaching of geometry:

(1) What is the attitude of the reformers (including Professor Perry and his friends) on this matter?

(2) What is the attitude of the public schools?

With regard to the first, a great deal of serious misrepresentation prevails. We have been accused of aiming at the *destruction of accurate deductive reasoning* and of a desire to replace it by a rapid mechanical process, commonly called "practical mathematics," the mere employment of rules, whether of arithmetic or of geometrical drawing, without an adequate training in the study of *proofs* and in the demonstrative reasoning on which these rules are founded. The charge is quite baseless. We wish for some change in the axiomatic assumptions of Euclid, and a materially different order of propositions—having a due regard to simplicity, naturalness of sequence, and im-

portance of results. There will be plenty of severe deductive reasoning for our student of geometry to go through, even though we have greatly accelerated his entrance into the subject by brushing aside the obstructions with which Euclid confronts him at the threshold. Those who bring this charge are apt to overdo their contention to an extent which palpably renders their case ridiculous.

Next, what is the attitude of the public schools? Conservative and classical, of course. They are dominated by examinations. They say that the Universities and the Civil Service Commissioners insist upon Euclid, because there must be some universal standard of geometrical order, and that standard must be Euclid. I agree that there must be some such standard, although even this is disputed by some reformers. I do not see how we can do without it, but I deny the necessity for having Euclid.

THE TEACHING OF EUCLID'S ELEMENTS.¹

By W. C. FLETCHER, M.A.
Headmaster of Liverpool Institute.

THE subjects of our curricula are valuable either for their content or for their disciplinary power. Geometry surely is valuable for both reasons. To craftsmen of every kind it is a necessity. To all of us, were it only for the reading of maps, it is in itself interesting and useful. Its value as discipline is uncontested. The problem is so to handle it as to combine to best advantage the two ends, knowledge and discipline. I shall try to show that the traditional method of dealing with the subject, which confessedly sacrifices the former end to the latter, in reality sacrifices both.

From the point of view of content Euclid's propositions fall into three or four classes:—

(1) Propositions which "prove" facts already known by experience or facts recognised intuitively as soon as they are clearly stated, e.g., I., 7, 13, 15, 20; III., 10.

(2) Those which reveal a new fact, e.g., I., 32, 35, 47; III., 20, 35, and the problems.

(3) Link propositions, put in merely to connect others.

(4) Certain propositions of considerable academic interest as showing what can be done under the limitations to which Euclid has subjected himself, but not otherwise of value: II., 11; IV., 10.

Of the propositions in group 1, most boys have a great dislike—as I think—a laudable dislike. "Why," they may well say, "bother us with 'proving' what we know?"

As we call our hands our own,
With knowledge absolute.

The effective content of Euclid consists merely of the propositions in the second group. This content is very small. Anything less than the whole of it is hardly worth considering. It bears to geometry much the same relation that the multiplication table bears to arithmetic, or its accidence to a language.

But, it is said, the chief value of Euclid lies in the training in strict reasoning that he affords. Now, no one would deny that anyone who has mastered Euclid, and can apply his methods independently, has passed through a very valuable training

indeed. But what about the ordinary pass candidate? What training has he received? He writes out proofs of propositions which he has learnt, at the best with understanding, at the worst without. His mind has been simply receptive, there is no evidence of reasoning power or of any activity other than that of memory. Until a boy can do riders we have no assurance that the training we look for has been given. For the pass candidate, I believe that the educative value of Euclid is a myth. The fact seems to be that in geometry deduction alone is barren. The power of observation and intuition are necessary components of the geometrical faculty.

The elementary facts of geometry were not probably discovered by deduction. They were known before Euclid systematised them, and showed that they could be evolved deductively from *three*, not from two or four, but just from three, fundamental assumptions. His work is most interesting from this point of view, but the point of view is metaphysical, and neither natural nor suitable for boys studying geometry for the first time.

A better training is secured, even in deductive reasoning itself, if it is employed only when its use is natural and necessary. For instance, a boy knows perfectly well that a straight line is the shortest distance between two points. Euclid's deductive proof makes him none the wiser. And the example of reasoning which it gives him he regards as useless because it leads to nothing. But the first time that a boy hears of I., 32, 35, or 47, he is surprised, probably incredulous. "I'm sure," he says, "that I can make a triangle whose angles exceed two right angles"—or "Surely this long parallelogram is bigger than that short one." In such cases, of course, Euclid's "proof" is of interest and value, though even here I do not think a healthy mind is satisfied by the deductive proof alone. It is only when more careful observation and reflection has removed the apparent absurdity, and when the possibility, if not the actual, truth of the proposition is intuitively perceived, that the mind is really convinced. The same phase of mental feeling occurs frequently in analytical geometry. If, after a long piece of algebra a result comes out of unexpected simplicity, we say to ourselves, "I have not got to the bottom of this, there must be some simpler method," and the mind is not satisfied, is not sure that there may not be a mistake lurking in the algebra, until a simpler, and if possible, a geometrical method is found. I conclude that in geometry intuition and deduction must go hand in hand, now one, now the other leading, and each in turn confirming the other.

Now in the study of Euclid bookwork—all that the pass candidate generally arrives at—intuition is neglected; the geometrical faculty therefore is not developed. The power of doing riders depends not only, indeed far less, upon the knowledge of Euclid's proofs of propositions than on a real knowledge of the propositions themselves. These are the tools the boy has to work with, and it matters less that he should know how they were made than that he should be able to use them effectively. At present we waste much of his time in making him learn how they came into being.

The orthodox attitude is well illustrated in the treatment of Book VI. Every boy understands proportion from the time when he first considers whether it is better to buy apples at 1d. each, or at two for 1½d. The practical application of proportion to geometry is perfectly simple, and of great service (do we not use it every time we consider the scale of a map?). But when Euclid came to treat the matter, he not only found himself hampered by the imperfect development of arithmetic, but also found himself confronted by the subtle difficulty of incommensurables.

This difficulty, of course, he faced and overcame in Book V. To ignore the difficulty, it is said, would be "unsound."

¹ An address delivered at the annual meeting of the Incorporated Association of Headmasters to propose the following resolution, which was subsequently adopted:—"That the Association desires to press upon the Universities and other examining bodies the desirability of greater elasticity in their regulations, and is of opinion that to insist upon adherence to the order of propositions in Euclid is mischievous."

subversive of all intellectual—perhaps even of moral truth. Therefore the beginner in geometry must on no account make use of his knowledge of proportion—for it is not a “sound” knowledge. Very well! but what happens? When a boy has got through Books I.-IV. and aspires to honours, does he face the difficulty? Not in the least. He cannot even be made to understand it without great care, and he is very seldom troubled with it. He takes his ideas of proportion as they are—probably takes VI. 1 and 33 as obvious—and has, of course, no difficulty with the rest. It seems to me a piece of hypocritical pedantry.

What, then, are practically our needs? The wide introduction of experimental science in our schools—whether under “Science School” regulations, or under section 73 of the Directory of the Board of Education—has made it a matter of urgent importance to co-ordinate mathematics with geometrical drawing and with physics, *i.e.*, with practical mensuration. For this purpose an early mastery of the effective content of Euclid is necessary. Either the two must remain divorced, and boys must spend years in one classroom over learning in Euclid’s fashion a few facts which elsewhere they learn differently in a quarter of the time, or our system of teaching geometry must be recast. I can best pursue the argument and make clear the kind of system that would arise by shortly stating the changes I have myself found necessary.

Book I., 1-32, I re-arrange. This contains propositions on three separate subjects arranged in an artificial order for Euclid’s special purpose of deducing everything from three fundamental assumptions. There are mixed up propositions on angles, on triangulation and certain propositions on inequalities. Now Euclid does not define an angle and his treatment of it does not lead boys to appreciate its real nature. This difficulty must be faced independently. When the nature of an angle is fully understood the truth of I., 13, 15, 29 and 32 cor. 2, is perceived intuitively. I., 32, itself can be treated in like manner, or can be deduced from the 2nd corollary.

Angles being understood and these fundamental facts about them thoroughly known, triangulation must be considered. On consideration—by experiment, or intuition as you like to phrase it—it is clear that three data are required, and in certain cases are sufficient to define a triangle. I., 4, 8, 26, are thus obtained “intuitively.”

All the rest of Euclid practically consists of exercises—deductions from these. Boys can now begin to study Euclid’s turns of expression, and the method of deductive proof with advantage. Most of the propositions, with perhaps a little help, they can work as riders, 9-12, 33, 34, 35, the rest of book I., and the great variety of other propositions about quadrilaterals.

The practical work associated with this consists of the construction of simple solids, their mensuration, sketches, plans and elevations; construction of regular polygons (by I., 32, cor. 2), and a little pattern drawing; “heights and distances,” by drawing and measurement.

II., 12 and 13, can be treated like I., 47. The rest of Book II. is useless in connection with other work, nor does it afford good material for riders. On both accounts I find it better to proceed with Book III. (much curtailed), and the fundamental facts of Book IV.-VI., 2, 4, and similar figures.

The whole subject is now open, and presents no further difficulty.

The objects of such a scheme are twofold:—

(1) To reduce the bookwork to what is essential only, so securing adequate time for riders and individual work.

(2) To co-ordinate theoretical with practical work. Working on these lines I find

(i.) That all boys learn something, and that what knowledge they do acquire is real, not mere knowledge of words.

(ii.) That most boys can develop the faculty of doing riders. The present demand is for liberty.

Insistence on the order of Euclid—whether the order of his books, or of his propositions—I have shown to be a hindrance, at least in the first year or two of study. I am not suggesting the imposition of any other system; until we are free to experiment we cannot get at the best. But I do not think that in practice freedom would lead to any great divergence from the order I have sketched. It would go a long way if examining bodies would, without abandoning Euclid’s classification entirely,

(1) Prescribe for their easier examinations the substance of Books I. and III., instead of I. and II.

(2) Regard as bookwork only the really important propositions.

(3) Permit, at least in the early propositions (1-32), the abandonment of Euclid’s order.

(4) Pay more attention to the knowledge of the facts themselves, apart from the “proofs” of the facts.

Since the above was written there has appeared a letter to the Committee of the British Association, signed by mathematical masters at several of the great schools. This letter advocates reform on the lines of the present paper. With all it says I am in entire agreement. On one small point I should go further, and propose to treat III., 35, by III., 21, and VI., 4.

ITEMS OF INTEREST.

GENERAL.

AN order issued by the Privy Council, with the approval of the Consultative Committee, details the manner in which the register of teachers, to which most of our readers are looking forward, shall be formed and kept. A Teachers’ Registration Council of twelve persons is to be constituted, six members are to be nominated by the President of the Board of Education and six by educational organisations, namely, one each by the Conference of Headmasters, the Association of Headmasters, the Association of Headmistresses, the College of Preceptors, the Teachers’ Guild, and the National Union of Teachers. This authority will remain in power for three years, when another body will be appointed, by a fresh Order in Council, presumably by election from the register. The register will contain an alphabetical list of teachers who, in the opinion of the Consultative Committee, deserve to be placed upon it. In addition to the general alphabetical list, there will be a column containing the names of those teachers recognised by the Board of Education as “certificated,” and another column containing the names of those teachers who, in the opinion of the council, are otherwise qualified.

EVENTUALLY only teachers who hold University degrees or one of the seven recognised diplomas or certificates, who have undergone a year’s training in a recognised training college and obtained a diploma in the theory of education, or who have passed an approved examination in the theory of teaching and spent a year as a student teacher at a recognised school, and who have taught for one year in a recognised school as a probationer, will appear in the list of those “otherwise qualified.” But for the first three years the requirements for registration are less stringent. During this period teachers who have passed such examinations as the Intermediate Arts of London University, or Oxford Pass Moderations, and have had three years’ experience in a recognised school, or who possess a recog-

nised diploma and produce satisfactory evidence of three years' experience of teaching in secondary schools, will be admitted to the register. Time spent in original scientific research may to some extent take the place of other qualifications. Provision is also made for supplementary registers of teachers of music, drawing, cookery, and other special subjects.

We are glad that the Consultative Committee have adopted the view that all teachers are employed in the same important work, though that work consists of several grades. The columns of the register will sufficiently differentiate teachers of different grades. Elementary teachers are to be registered free of charge, though for the registration of their supplementary qualifications a fee will be demanded. Other teachers are to pay a guinea for registration. There can be little doubt that there will be a great demand for registration, and it will not be long, especially since we understand the Consultative Committee recommend the restriction of parliamentary and other grants to schools with a fair proportion of registered teachers, before it will be impossible for unqualified persons to enter the profession. Copies of the Order in Council may be obtained from Messrs. Eyre and Spottiswoode or through any bookseller, price 1½d.

THE Association of Assistant-Mistresses in Public Secondary Schools provides an excellent opportunity, at its periodical meetings, for the discussion by its members of important educational questions. Unless assistant-masters and assistant-mistresses belong to some such body, there is a grave danger that they will remain in ignorance of the methods employed by their colleagues in other schools, with the result that their teaching will become mechanical and ineffective. More than this, a teacher ignorant of the work of all schools save that in which he is teaching is apt to lose sight of the part he is called upon to play in our national education, and to remain uninspired by the stimulating knowledge that he is one of a great army of workers striving for the well-being of our country. Judging from the proceedings of the recent annual meeting of the Association of Assistant-Mistresses, over which Miss E. R. Pearson presided, a large number of the teachers in the high schools throughout the country are well aware of the advantages which spring from discussing educational topics.

THE membership of the Association of University Women Teachers continues to increase, and is now over a thousand, the increase during the past year being 258. The last report shows there has been some improvement in the salaries of assistant-mistresses, and that the supply of mistresses for modern languages and science is still less than the demand.

AT the eleventh annual meeting of the Association of Directors and Organising Secretaries for Technical and Secondary Education the new President, Mr. Austin Keen (Cambridgeshire), delivered an address dealing with education in rural districts. After a survey of the unsuitability of the past teaching in rural elementary and secondary schools, Mr. Keen sketched the best way to remodel present systems and to supply necessary additional schools. A discussion followed on a resolution proposed by Mr. H. Macan (Surrey) and eventually adopted by the Association, "That this Association considers it imperative that the councils of counties and county boroughs should at once be constituted the supreme supervisory and rating authorities in their areas for both elementary and secondary—including technical—education."

THE Society of Arts is endeavouring to extend its modern-languages examinations, so as to make them include a *viva-voce* test. The written examinations are now carried on at 300 centres throughout the United Kingdom. A notice has been

sent out to all these centres, to the effect that a *viva-voce* examination will be held at any centre where twenty-four candidates can be collected, at a fee of 2s. 6d. a head. The Society's examinations include all modern languages of commercial importance, but at present *viva-voce* examinations will only be held in French, German and Spanish. The tests are to include dictation, reading, and conversation.

THE address delivered to the Association of Principals and Lecturers of Training Colleges at their last annual meeting by Prof. S. S. Laurie, on "The Decentralising Policy of the Board of Education in England," has been published at a shilling by the Cambridge University Press. The slowness of human progress is brought into high relief by Prof. Laurie: "4,000 years before the birth of Christ, popular education in ancient Egypt seems to have been far ahead of what it was in England so recently as the middle of the nineteenth century. Brugsch says: 'Neither descent nor family hampered the rising career of the clever.' And Rawlinson says: 'Egypt provided an open career for talent such as scarcely existed anywhere else in the old world, and such as few modern communities may be said even yet to furnish.' And Maspero adds: 'There is no sacrifice which the smaller folk deem too great if it enables them to give their sons the acquirements which may raise them above the common people, or else insure a less miserable fate.' And yet, in this country not so very long ago, a great nation looked on with equanimity while child ignorance and child labour brought disgrace on what we call our Christianity."

THE Board of Education has issued "specimen courses of object lessons and instruction in gardening in actual operation in elementary schools." Three plans, drawn to scale, are provided, showing how the gardens of certain selected schools are laid out in plots. A list of the tools and other equipment is given, with their cost, and how the expenses are met by Government grants. There are, in addition, schedules of the courses of instruction in gardening given in schools in typical districts. The publication should be very useful to teachers of rural schools.

THE West Riding Technical Instruction Committee has drawn up proposals for the award of local scholarships in science and art. The current "Directory" of the Board of Education lays it down that, in order to secure payments from South Kensington, contributions levied under the Technical Instruction Act may be regarded as local subscriptions. The West Riding scheme, which has now been adopted by the County Council, takes advantage of this concession. The first batch of 145 scholarships has been awarded upon the result of the county examination held in May last, and the successful pupils are attending secondary schools. Most of the elementary schools of the area participate in the scheme. The Board of Education grants are not paid to parents, but to the County Council, and this arrangement is found to work quite satisfactorily.

MISS H. M. GOULD has given five thousand dollars to New York University for the establishment of a museum of pedagogy, with the understanding that this should be applied in the first place to an exhibit of the work done for education by New York University, which should form an exhibit at the World's Fair at St. Louis in 1903, and afterwards become the property of the School of Pedagogy.

THE "Société des Professeurs de Français en Angleterre" have just issued their Report of the Annual Grand Concours. This year, for the first time, the President of the French Republic has offered a Sèvres vase to the two Colleges, boys' and

girls, that have obtained the highest total. The Cheltenham Ladies' College has gained one, having reached the grand total of 3,061 for five candidates. The same College obtains also the Silver Medal given by L'Alliance Française, besides three prizes and eleven "mentions honorables." In the "Concours des Lauréats" the College also gains a prize.

A DIFFICULTY is often experienced in deciding what periodicals shall find a place upon the reading-room table of boarding schools. We would strongly recommend teachers who are responsible for such selection to examine *Knowledge* carefully. It would be difficult to find a more suitable magazine for schools with a fair number of pupils in the higher forms on the modern side. Its brightly and accurately written articles on scientific subjects and its wealth of good illustrations will secure the interest of all young students of science. Every science teacher, too, would find the "Knowledge Diary and Scientific Handbook," 1902 (3s. 6d.), very useful.

WE have received the first number of the *Nature-Study Journal*, published by the South-Eastern Agricultural College, under the editorship of the Principal, Mr. W. D. Hall. The journal is to be published monthly, and is intended to provide a means of communication between teachers engaged in teaching nature-study.

In addition to its numerous articles on current topics, the *Indian Review*, of Madras, pays special attention to educational questions. Not only are the particular needs of Indian education dealt with by writers of experience, but the problems with which British schoolmasters are confronted are explained from time to time with great ability. In the issue for December last an article by Miss Geraldine Hodgson, entitled, "Problems of Education," reviews the whole field of education, and insists, since the work of the teacher is so important, upon the need there is for a proper system of training for all teachers.

THE new syllabus of Homerton College, Cambridge, gives full particulars of a two-years' continuous course of training for teachers in elementary schools. Many acting teachers who are reading privately for a diploma in teaching can obtain from it useful hints in the selection of text-books.

THE Civil Service Commissioners announce that an open Competition will be held in London commencing on April 8th, 1902, for not fewer than six situations as Student Interpreter in China, Japan, or Siam. The six situations at present vacant are in China. The examination will be in the following subjects, viz.:—*Obligatory*: Handwriting and orthography; arithmetic (including vulgar and decimal fractions); and English composition. *Optional*: Précis; geography; Euclid (books I. to IV.); Latin; French; German; and (a) the elements of criminal law; (b) the elements of British mercantile and commercial law. A fee of £4 will be required from every candidate attending the examination. The limits of age are 18 and 24 on the first day of the examination. Entry forms, obtainable from the Secretary, Civil Service Commission, S.W., must be returned to him on or before March 20th. The office of student interpreter was instituted to supply the Consular Service in China, Japan, and Siam with persons versed in the languages of those countries. The student interpreters devote themselves, in the first place, to the study of the language of the country to which they are appointed, and, in the next place, qualify themselves generally for the public service. The salary of student interpreters is fixed at the rate of £200 a year, commencing ten days previously to the date of their departure from England.

THE examinations for appointments as apprentices to the various trades in His Majesty's Dockyards are held in April and October each year. Applications to attend the April examination should be sent at once to the Secretary of the Admiralty, Whitehall, S.W. Candidates must be between the ages of 13½ and 16 on May 1st for this examination. The subjects for examination, are: *Obligatory*: Arithmetic and English (including handwriting, spelling and composition). *Optional*: either Geography or the elements of Chemistry and Physics; Euclid, books I.-III., and Algebra (up to and including quadratic equations). Apprentices serve six years, and are allowed pay at the rate of 4s. a week the first year, rising 2s. a week every year. Apprentices attend the Dockyard schools for four years, and at the end of that time are required to undergo an examination in advanced mathematical and scientific subjects, and in shipbuilding or engineering. If an apprentice obtains exceptionally good results at this examination there is a prospect of his becoming a student in Naval Construction or Marine Engineering at Keyham.

SCOTTISH.

LORD BALFOUR, in opening a public school in Edinburgh, referred to the agitation that was springing up in certain quarters for freeing secondary education. Mr. Carnegie's munificent gift to the universities had given new life to the demand, but he entirely deprecated any attempt to abolish fees in secondary schools. The majority of parents with children at such schools were both able and willing to pay fees, and the numerous bursaries and scholarships attached to almost every secondary school ensured the attendance of all able pupils whom the circumstances of their parents might otherwise shut out. In the public secondary schools of the country the fees amounted to £60,000 annually, and it would be a gross waste of public money to throw this sum away for the sake of a mere sentiment—a free educational ladder from the elementary school to the university. To all who wished it and deserved it this was already secured, and it was folly to press upon others a boon which they neither wanted nor appreciated.

AT the recent annual general meeting of the Association of Technical Institutions, held in London, the efforts of the Scotch Education Department to build up an educational system thorough and efficient in every field of operation, received generous recognition from several speakers. The success of the Department in solving the problem of technical education was specially referred to, and a resolution was passed directing the attention of the Board of Education to the policy of the Department in allocating large grants to technical colleges without any of the restrictions which governed similar grants to schools, and asking that English technical institutions should be accorded similar privileges.

SIR HENRY CRAIK, in the course of the proceedings, said that in Scotland they were fortunate in having an enlightened public opinion constantly in evidence, which seconded every effort of the Department to broaden and perfect the education system. In regard to technical education, Scotland had no traditions or practice in the past to help them or to trammel them in working out a satisfactory system. It was necessary, therefore, that their first steps in establishing such a system should be tentative and experimental, and that no hard and fast rules should be laid down for its direction till experience had clearly determined their value. He might claim that at length they had arrived at a stage when they could with confidence lay down broad, general principles, which would guide all their efforts in the future. They now saw that technical education was entirely distinct in character and aim from school education, and that to graft it upon the school curriculum would be to defeat the primary purposes of each.

Technical education was specialisation in the sphere of one's life work, and could only be effective when based on a sound general education, which it was the true function of a school to give. Again, technical education was essentially a practical training, and in its best form should be a combination of workshop experience *pari passu* with the science and art of that work at a technical institute. Technical education must not only be practical in its methods and teaching, but practical also in its teachers, who should be intimately and practically acquainted with the technical arts and sciences they taught.

THE Scotch Education Department have made an important modification in the system of Leaving Certificates. Henceforth Leaving Certificates, properly so called, will cease to be issued in respect of passes in single subjects, and will be granted only for passes in well-defined groups. The detailed arrangement of these groups is not yet finally settled, but the Department may be trusted to make them sufficiently varied to suit the requirements of every type of school. It is not intended in the meantime to insist on all the subjects in each group being passed in the one year, as the Department intend to issue a document to each candidate certifying the subject and grade in which he or she has passed towards attaining the group certificate. This, however, can only be recognised as a temporary expedient to bridge the old and the new systems. If the groups were made sufficiently varied, the step to group certificates pure and simple might well have been made at once. But even the present compromise will be heartily welcomed by secondary teachers as a great step in advance, and as a further earnest of the wise attitude of the Education Department to all reforms that are pressed upon them by those engaged in the actual work of teaching.

AT a meeting of classical teachers, held in the High School, Edinburgh, it was proposed to form an "Association of Classical Teachers in Scotland." The object of the association would be to bring together for practical conference all persons interested in classical education. It was suggested that papers might be read, followed by discussions on such subjects as these:—The value of composition, and the best methods of teaching it; the place of history and philology in a classical curriculum; the relative importance of unseen and prescribed work; the methods of classical teaching in other countries. Other subjects akin to these would easily be found, and their discussions would be helpful to the members, and serve to educate the public to the claims of classics for a place in general education. A provisional committee, consisting of the leading professors and classical masters in Scotland, has been formed to carry out the necessary arrangements for the first annual meeting.

IRISH.

ONE of the most important announcements emanating for some time past from Trinity College states that the governing body of the University of Dublin has appointed a committee to consider the question of admitting women to University degrees. There is good ground for hoping that their report will be favourable. It is not likely that technical difficulties—such, for example, as that the statutes always speak of students in the masculine gender—will be allowed to present any insuperable obstacle. Greater difficulties will arise from the consideration of residence and lectures. These will most easily solve themselves by admitting women to professional and other lectures in Trinity itself along with male students, and in recognising for ordinary lectures some external college specially adapted to women. The nucleus of such an institution might possibly be found in the Alexandra College, which, however,

would require considerable remodelling and reformation. It would require to be raised from its condition as half school and half college to university level proper, and also to be divested of its semi-local character.

THE work of the Board of Agricultural and Technical Instruction for Ireland has made an excellent start. In intermediate schools, no doubt largely owing to the support of the Intermediate Board, its programme has been practically adopted everywhere, as is shown by the figures quoted by Mr. Gill, the secretary of the Department, at the opening of the new laboratory of the Sandymount Academic Institution in January. He stated that no fewer than 165 schools have started laboratories and begun the teaching of science under the Department since last year. As this is quite half of the number which last year received grants from the Intermediate Board, and many other schools are making arrangements for laboratories which will be shortly completed, the revolution in favour of science teaching may be regarded as a *fait accompli*. Mr. Gill, however, had to complain of the action of some local authorities. While many towns, like Belfast, at once took advantage of the Act and made grants to schools to enable them to provide laboratories, there are some county and urban district councils who have done nothing. The Pembroke Urban District Council, for example, has refused to make any grant, thus hampering the work of the Sandymount School. Up to the present, too, the Dublin Corporation are still considering what they will do. At first altogether reluctant, they are now believed to be favourably inclined towards helping the various Dublin schools with initial grants for laboratories. As the initial expense is generally the main difficulty, local authorities should remember the proverb, *bis dat qui cito dat*.

THE work in Technical Schools proper is also going steadily forward. Blackrock has drawn up a scheme whereby it is hoped to be able soon to send some of the most promising pupils to a central technical school or to the Royal College of Science. Rathmines has taken over Dr. Benson's school, and proposes to establish a commercial school on lines suggested by the Dublin and other Chambers of Commerce. These are interesting experiments, and wisely directed, should work out well. The Roman Catholic Association of Headmasters, however, has passed a resolution expressing a hope that the work of these new technical schools will not trench on that of secondary schools proper, and that their pupils will not be encouraged to attend the former without laying first a proper basis of general education. So long as sound educational principles underlie these experiments there is not likely to be any serious harm done.

BUT what are we to say of the following? To what lengths will the United Irish League proceed? The County Council of King's County last year levied a rate of 1d. in the £ for the purposes of agricultural and technical instruction under the new Act; the arrangements were well forward, and it was proposed to establish schools in Birr and Tullamore. But this year the rate is refused and the scheme collapses. Mr. William Delany, M.P., successfully opposed the rate, giving two reasons. The first was that Mr. Horace Plunkett, as parliamentary candidate for Galway, had used his position as Vice-President of the Department unfairly to promote his prospects at the election. The second was that the Act was being used to inflate the prices of land, so that farmers who wished to purchase their holdings under the Land Purchase Act would have to pay more for them.

THE Intermediate Board made two announcements last month. The first is that Experimental Science will remain an optional subject for a year longer, but will without fail become

compulsory in the Preparatory Grade for 1904, the Junior Grade for 1905, the Middle Grade for 1906, and the Senior Grade for 1907. This should give all schools time to start and equip laboratories and obtain proper teachers under the new scheme. The other announcement is as to the date and hours of the forthcoming examination next June. It will this year begin later than usual, viz., June 17th. The papers in the Preparatory Grade will be pass papers only, and will last for two hours each, from ten to twelve and three to five each day; the interval twelve to three is rather long for students who live a long way from the examination centre, but the shortening of the papers is a good move. In the other grades the morning papers last from ten to one, and the afternoon papers from three to five. No subject has more than one paper assigned to it, and pass and honour papers will be set simultaneously. It will be interesting to see what kind of papers will be set.

WELSH.

At an Educational Conference at Bangor, the Rev. J. Hughes, of Holyhead, gave some statistics showing the waste of money, of efforts and machinery, in the present educational system. In Holyhead there are three elementary schools, and three separate and independent local educational authorities. Again, Carnarvonshire contributed 23s. per head for the education of the children whilst Anglesey only paid 17s. 6d. per head. The unequal incidence of taxation was to be deplored. Dealing with the question of school attendance, he pointed out that Anglesey lost annually £3,000 in Government grants from irregular attendance of children. The great remedy would be to have enlarged areas, which would tend to equalise the incidence of taxation and to make the whole machinery of education more effective.

In Parliament, in the Amendment to the Address proposed as to the extension of local government in Wales, Mr. Lloyd George said that education was one of the subjects in which Wales had shown its capacity for self-government. "Welsh secondary education is better than English, but primary education is infinitely worse, because it is not adapted to Welsh sentiment. It is a failure as compared with the other system which they have control over."

Mr. ALLANSON PICTON, Chairman of the Governors of the Llandudno County School, said at their recent Prize-Day that in his opinion the middle classes had been much neglected in the matter of education. While poor people had been for thirty years past provided with ample school space and school teaching, shopkeepers, clerks, and those with salaries of £500 or £600 a year, or even up to £1,000 a year, had not been able to get the sort of education they wanted. These schools had not been helped by the State. If one class of people were helped to get an education, it was not fair that others should not be helped to the extent of their necessities. Mr. Picton drew attention to the fact that the late Mr. John Bright was very fond of Llandudno, and that a fund had been raised to establish a memorial of him in connection with the school. It was proposed to call the school the "John Bright School," and he hoped that a good bust of Mr. Bright would be put prominently in the school to remind posterity of his goodwill to the town.

On the same occasion, Principal Roberts (of the University College of Wales, Aberystwyth) gave an address on the Welsh County School System. He dwelt on the fact that these schools have the most practical, the most modern system of education

that could be well conceived. Hence the school would not realise its type without good laboratories, workshops and apparatus. Speaking of the expected Education Bill, Principal Roberts said the County Governing Bodies in Wales, no doubt readjusted as time went on to its extending functions, undeniably afforded the nucleus of the parliament of education they hoped before long to see in each Welsh county. Such a parliament of education in each county would be able to bring system and order into all the educational provisions within the county, to encourage and develop elementary and secondary education, and not only that, but as time required, to establish a systematic provision of continuation schools and technical education, embracing within its operations every parish within the county. Principal Roberts then pointed out the absolute necessity for good secondary education if a sound technical education is to be based on it, and the necessity for constantly raising the age of leaving school.

THE Llangollen School Board have instituted an enquiry into the religious instruction given in the elementary schools of the town. It appears that such instruction is given by the staff of the school, and "on an average thirty minutes a day are devoted to the subject." There is no authorised syllabus, but in accordance with a resolution passed by the Board in 1884, the Scriptures are read by the teachers, the Lord's Prayer is repeated, grace before and after meals is said, and hymns (chosen by the head teacher) are sung. This resolution, however, it was reported, is not strictly observed. Notice has been given of a motion to rescind the 1884 resolution with a view to the Board's requiring a more comprehensive syllabus for the use of the Board schools.

CURRENT HISTORY.

THE "annexation" of the Orange Free State and the South African Republic (commonly known as the Transvaal) has created a curious and unusual condition of things. If these districts are really parts of the British Empire, those who are in arms against us are not, in technical international law, "enemies": they should legally be regarded as "rebels" quite as much as the citizens of Cape Colony who have joined them. Yet the British Government still regards them as "belligerents" with the rights which a "state of belligerency" grants in international law. To the other European States, as we have not yet publicly "notified" the annexation, they are still the "public enemies" of the British Empire. The situation is, as we have said, unusual and curious. If there were any serious thoughts of "intervention," it would lead to difficulties arising out of inconsistency. But the constant talk about "negotiations" suggests certain interesting parallels and questions. From the British point of view, here are two "States" which do not possess a qualification usually regarded in modern times as necessary to the existence of a State—viz. a territory. We must "negotiate" with them, if at all, as the Roman Empire negotiated with the "wandering nations" of the fifth and sixth centuries, the Goths and Vandals, the Lombards and Franks, who invaded the Empire, defeated its armies, acknowledged its Emperors and "squatted" wherever they pleased.

THE history of Ireland provides us with further illustrations which compel us, if we are to make a science of history and be consistent in the use of our technical terms, to enlarge our conception of the word "State" and its significance. All our text-books tell us of O'Connell and his agitation for "Catholic Emancipation" in the twenties of the last century; and every

one knows that the Association he formed collected its "Catholic rent" with far more ease and regularity than the British Government its taxes. Since then we have known Land Leagues, Plans of Campaign, and all the various organisations which have ruled Ireland, more or less successfully conducting agitation against the Unionist scheme of government for the "United Kingdom." And now in January, 1902, we learn in our daily papers that the "Sligo County Council, at the bidding of the United Irish League, have dismissed their solicitor" not for any want of capacity, but "because he is Crown Solicitor for county Sligo." The League thinks that "no man can serve two masters." But, with such facts, how can we, in scientific politics, fail to regard the United Irish League as a State, at least in embryo. The Mahrattas of the 18th century ruled as far as their horsemen could ride. Abraham ruled his wandering household and made war on behalf of his nephew Lot. It is only in the artificial society of modern Europe that the possession of territory is a necessary qualification for a State.

THE politics of the world are concerned with three great interests and passions of mankind—race, religion and commerce. Each of these may act according to circumstances as a centripetal or a centrifugal force. They may, in other words, bring men together or separate them. Of the three, "race" is symbolised for the most part by language. The probability that the two—common origin and common language—are conterminous is so great that we generally assume its universal truth. Certainly in those States where there are large differences of language, there is much difficulty in conducting a common government. Austria-Hungary, with its dozen languages, is the standing example of this almost insoluble problem. We might quote others, but it will suffice to point to the new revival of interest in the Gaelic language in Ireland which led lately to an attempt to introduce polyglottism into the House of Commons at Westminster, or to the attempt of the Prussian Government to teach religion in German to their little Polish subjects. But one of the most interesting illustrations has recently arrived from America, where the representative of Hayti in the Pan-American Congress asked that a vote might be taken again on an extradition proposal, because he had voted without understanding it owing to his ignorance of Spanish. Pan-Americanism will have to decide which of the two predominant tongues shall ultimately prevail on that Continent.

THE Sunday question has many aspects—religious, social, economic. Whether England is undergoing any change; whether, if so, that change is for the better or worse; what arguments may legitimately be used on either side of the question—these are matters of chronic dispute among us. There is certainly a movement on the Continent in favour of some relaxation of labour on Sunday, and the latest news comes from Belgium, where they have passed a law which makes Sunday labour henceforth optional, not compulsory, and which will leave employer and employed free to make their own arrangements on the matter. We remember in this connection how gradually Sunday came in the early centuries of our era to replace the seventh day of the Jews, and to be regarded as a sacred day. We also remember the Puritan idea and practice and how they conflicted with Stuart ideas and the "Book of Sports." It is interesting and instructive to read the story of that famous declaration and the opposition thereto in Dr. Gardiner's History of England, and to remember that one of the reasons which drove the Pilgrim Fathers from Holland to New England in 1620 was their dislike of the "Continental Sunday." Their Protestant Dutch friends, on the contrary, thought their Sabbath notions "an English fiction." New England Sabbaths of the 17th century are famous.

SCOTCH LEAVING CERTIFICATE EXAMINATIONS, 1902.

Revision Test Papers.

HIGHER GRADE.

English Grammar and Literature.

- (1) Write an essay on one of the following subjects:—
 - (a) The Census—its development and uses.
 - (b) Progress during the Victorian Era.
 - (c) The influence of climate on character.
- (2) Paraphrase:—

Will makes the man; who carves not time and chance
To his own bidding, until seeming ill
Concur his cherished purpose to fulfil,
Has yet to learn that his inheritance
Lies in himself; who waits on circumstance
Will find that circumstance is only true
To him who dares a noble aim pursue
In her despite. Doth Fortune look askance
On thee; she were not Fortune did she wear
The self-same aspect ever; up and bear
Thyself as of that hidden brotherhood,
Those slips of the true Adam, whose rank life,
Purged by Adversity's sharp pruning-knife,
Becomes prolific of immortal food.
- (3) Parse the words in italics and analyse the first six lines.
- (4) Write short etymological notes on seven of the following:—Seamstress, such, what, feet, its, Wednesday, whom, ours, vixen.
- (5) Distinguish with the aid of examples between Attributive and Predicative adjectives, and Continuative and Restrictive relative pronouns.
- (6) Classify the consonant sounds in the English alphabet.
- (7) Account for the dialects in Middle English. Which of these dialects finally became the ancestor of modern English? Account for its supremacy.
- (8) Give as concisely as you can, equivalents of Saxon origin for the following words:—frustrate, eliminate, elucidate, prevaricate, identical, eradicate, corroborate, reciprocal, inter-necine.
- (9) Describe the structure of the Sonnet. Name any famous sonnets you have heard of. Quote some lines from any one.
- (10) Explain with examples the following terms:—Epic, ballad, rhythm, lyric poetry, comedy, ode, blank verse, pastoral poetry.
- (11) Give the leading characteristic of the literary period you have been studying. Name six of the greatest works of the period with their respective authors. Give a short sketch of any one of these works.
- (12) Write a short study of one of the characters in Chaucer's "Canterbury Tales," Shakespeare's plays, or Scott's novels.

History.

- (1) Write short notes on eight of the following, selecting four from each group:—

Statutes.—Confirmatio Cartorum, Constitutions of Clarendon, Statute of Labourers, Statute of Provisors, Act of Supremacy, Statute of Six Articles, Poyning's Law, Navigation Acts, Corn Laws, Ballot Act, Test Act.

Events.—Assize of Clarendon, Peasants' Revolt, Treaty of Wedmore, Jack Cade's rebellion, Perkin Warbeck's rebellion, Pilgrimage of Grace, Treaty of Utrecht, Causes of Seven Years' War, Catholic Emancipation, Crimean War.
- (2) Describe the social and political condition of England at the close of (a) the Hundred Years' War, or (b) the War of the Roses, or (c) the Napoleonic Wars.
- (3) Name the great Churchmen before the Tudor period. State the policy and aims of each, and indicate to what extent these were successful.
- (4) Give a detailed account of one of the following:—The rise and progress of Parliamentary Government up to the reign of Edward I.; the ecclesiastical policy of Elizabeth; the causes of the Civil War; the effect upon Scotland of the Union of 1707; Franchise Reform in the 19th Century.

(5) What do you understand by "the Cabinet"? Trace its origin, and state its relation to the Sovereign and to Parliament respectively.

(6) Explain the terms :—maintenance, monopolies, fair trade, attainer, ship money, cabal, trades unions.

Geography.

(1) Name the leading sea-fisheries of the United Kingdom. Mention the ports which are the headquarters of each fishery.

(2) Give an account of *one* of the following as regards climate, products, means of communication, people and government :—Japan, Persia, Mexico, Morocco, Argentina, Venezuela.

(3) Draw a sketch map of Norway or Spain or Egypt or Brazil or New Zealand, inserting mountains, rivers and chief towns. Name the principal exports from the different districts of the country chosen.

(4) Give a description (or draw a sketch map) of the basins of *two* of the following rivers : indicate the position and importance of any towns on the banks of the two selected :—Elbe, Danube, Po, Mississippi, Obi, Hoang-ho, Irrawaddy, Murray, Zambesi, Orange.

(5) Explain fully and carefully any *two* of the following :—
(i.) The connection between geography and politics on the North-west Frontier of India. (ii.) The importance of the rivers of France to French commerce. (iii.) The historical and political importance of the Rhine. (iv.) The effects of the monsoons on the rainfall of India, on vegetation, and on the life of the people generally. (v.) The changes of the seasons. (vi.) The meaning of the terms *waves, currents, tides.*

(6) Select *ten* of the following : indicate their position, state anything of importance you know about them :—Monte Video, Valparaiso, Nicaragua, Belize, Esquimalt, Merv, Kiakta, Singapore, Agra, Brindisi, Nishni-novgorod, Upsala, Walvisch Bay, Beira, Antananarivo, Havana, Manila, Lima, Goa, Bogota.

(7) Give an account of the various routes by which a traveller might go from London to Australia.

Latin.

(1) Translate into English :—*Tua nos non magis virtus fortunaque quam unica comitas ac benignitas erga cives nostros quos captos nobis remisisti, ita conciliavit tibi ut te salvo atque incolumi amico non modo populum Romanum sed ne deos quidem, si fas est dici, timeremus. At hercule non solum incolumi et victore sed presente te—comploratum prope coniugum ac liberorum nostrorum exaudire et flagrantia tecta posses conspicerere—ita sumus aliquotiens hac aestate devastati ut M. Marcellus non Hannibal vicisse ad Cannas videatur glorienturque Romani te ad unum modo ictum vigentem velut aculeo emisso torpere. Non ego secundis rebus nostris gloriabor, duos consules ac duos consulares exercitus ab nobis sub iugum missos et si qua alia aut laeta aut gloriosa nobis evenerunt.*

(2) Translate with notes on syntax :—

(a) *Me truncus illapsus cerebro sustulerat nisi Faunus ictum levasset.*

(b) *Mene incepto desistere victam?*

(c) *Quin equos conscendimus?*

(d) *Antequam Troia incenderetur, equus ligneus in urbem admittendus erat.*

(3) Write short Latin sentences, illustrating the construction of the following verbs :—*Credo, intercedo, intersum, recipio, praesto, vaco.*

(4) Distinguish :—*Quis, quisquis, quisque, quivis, aliquis, quispiam, and give examples.*

(5) Explain and give examples of :—*Ethic dative, objective genitive, cognate accusative: hendiadys, chiasmus, meiosis.*

(6) Translate into Latin :—

(a) *From June 12th to November 31st they failed to capture a single city.*

(b) *He is at a loss what to do with these girls; they do nothing but laugh.*

(c) *I wish my brother had been here; I am inclined to think he has no interest in the matter.*

(d) *So far as I know, he never allows a day to pass without trying to be taught something new; how few there are that do this!*

(7) Translate into Latin :—*Caesar's legions had believed themselves to be invincible. The effect of this misfortune was to mortify and infuriate them. They were eager to fling themselves again upon the enemy, and win back their laurels; but*

Caesar saw that they were excited and unsteady, and that they required time to collect themselves. He spoke to them with his usual calm cheerfulness. He praised their courage, he reminded them of their many victories, and bade them not be cast down at a misadventure which they would soon repair; but he foresaw that the disaster would affect the temper of Greece and make his commissariat more difficult than it was already. He perceived that he must adopt some new plan of campaign, and with instant decision he fell back upon Apollonia.

French.

(1) Translate :—

(a) *Des seigneurs, des gentilshommes, des ministres de l'Évangile, au nombre de plus de quarante personnes, tous debout, la tête découverte et dans une attitude respectueuse, entouraient l'amiral. Il était très simplement vêtu et tout en noir. Sa taille était haute, mais un peu voûtée, et les fatigues de la guerre avaient imprimé sur son front chauve plus de rides que les années. Une longue barbe blanche tombait sur sa poitrine. Ses joues, naturellement creuses, le paraissaient encore davantage à cause d'une blessure dont la cicatrice enfoncée était à peine cachée par sa longue moustache; à la bataille de Montaucour, un coup de pistolet lui avait percé la joue et cassé plusieurs dents.—P. Mérimée.*

(b) *O bois natus, j'errais sous vos larges ramures;*

L'aube aux flancs noirs des monts marchait d'un pied vermeil;

La mer avec lenteur éveillait ses murmures,

Et de tout œil vivant fuyait le doux sommeil.

Au bord des nids, ouvrant ses ailes longtemps closes,

L'oiseau disait le jour avec un chant plus frais

Que la source agitant les verts buissons de roses,

Que le rire moqueur du vent dans les forêts.

—Leconte de Lisle.

(2) Translate into French :—*The absence of the French fleet from Brest, which led to the supposition that the harbour must be unguarded, seemed to afford an opportunity for an attack in that quarter. An expedition was planned; the forces were entrusted to Talmash, while the Duke of Leeds' son, Caermarthen, commanded the fleet. It gave occasion for a new act of villany on the part of Marlborough; though the plan was kept a profound secret, he managed to worm it out, and as had happened once or twice before in his career, he used his knowledge only to lay the details of the plan before James, and to secure the destruction of the English expedition.*

—J. F. Bright.

(3) Write in French a very short essay either on the South African War, or on the Glasgow Exhibition.

(4) Translate idiomatically :—*Le temps se remet au beau. Il faut que jeunesse se passe. Nous avons couru à qui mieux mieux. Il a acheté chat en poche. Il sait tirer son épingle du jeu.*

(5) Translate into French :—*He should be here by now; he must have missed his train, but he may still come. If he should arrive after I have gone, let me know at once.*

(6) At what time, and in what circumstances, did the following words pass into English? Give both their French and their Latin forms, with any explanations you think necessary : *aunt, count, esquire, nephew, strange, beef, veal, people, chair, study.*

(7) What is meant by a "doublet"? Give the doublets of : *captif, faction, grave, légalité, naviguer, noël, sevrer, examen, François, champ.*

(8) Translate, and give the etymology of the words in italics :

Par le bois va la dame, qui grant paour avoit.

Ce n'est pas grant merveille se li cuers li doloit,

Com cele qui ne set quel part aler devoit.

A destre et a senestre moult souvent regardoit,

Et devant et derrière, et puis si s'arestoit.

—Adenet le Roi.

German.

(1) Translate into English :—*Die Gemälde des Todes sind bei den Dichtern häufig, und nicht selten sehr schrecklich. Es ist der blass, bleiche, fahle Tod; er streift auf schwarzen Flügeln umher; er führt ein Schwert; er fletscht hungrige*

Zähne; er reißt einen gierigen Hachen auf; er hat blutige Nägel, mit welchen er seine bestimmten Opfer zeichnet; seine Gestalt ist so groß und ungeheuer, daß er ein ganzes Schlachtfeld überschattet, mit ganzen Städten davonreißt. Aber wo ist da nur ein Argwohn von einem Öriippe? In einem von den Trauerspielen des Euripides wird er sogar als eine handelnde Person mit aufgeführt, und er ist auch da der traurige, fürchterliche, unerbittliche Tod. Doch auch da ist er weit entfernt als ein Öriippe zu erscheinen.—Veijing.

(2) Translate into German:—Frederick the Great at the Battle of Kunnersdorf. The King led three charges in person. Two horses were killed under him. The officers of his staff fell all round him. His coat was pierced by several bullets. All was in vain. His infantry was driven back with frightful slaughter. Terror began to spread fast from man to man. At that moment, the fiery cavalry of Laudohn, still fresh, rushed on the wavering ranks. Then followed an universal rout.—Macaulay.

(3) Give the nominative singular (with definite article), the genitive singular, and the nominative plural of the German words for these:—*secret, individual, mushroom, bishop, tent, jewel, pleasure, anvil, shop, shutter.*

(4) Mention five nouns with double plurals, and five others for the plurals of which either different cognate stems or compound forms have to be used. Give the plurals and the meanings.

(5) Decline fully (a) *thou, good son*; (b) *I, poor man*; (c) the following beautiful poem.

(6) Give the second person singular present indicative, imperfect subjunctive and imperative; and the past participle, and infinitive with *zu*, of *zerbrechen, abnehmen, verderben, aufessen, erlöschen, vollbringen, missverstehen, wohlthun, recht-fertigen, handhaben.*

(7) Distinguish between *verschwinden, verschwenden; erlangen, verlangen; höflich, höfisch; kundlich, kindisch; steinig, steinicht.*

(8) Form abstract nouns (with definite article and meaning) from *lieblos, genug, standhaft, feucht, kalt, geschwind, übel, dunkel, eitel, stark.*

(9) Give the respective German or English words corresponding etymologically with the two following sets of words, adding in each case the actual meaning of the German word:—

(a) *axe, wave, crutch, bare, asp, bier, goat, pilgrim, ferry, hedge.*

(b) *auch, Reue, Ziegel, stolz, Kopf, Eid, schlimm, natter, Gasse, Baum.*

(10) Explain and illustrate the force and meaning of the "inseparable prefixes" *be, ver, zer, er.*

Arithmetic.

(1) Find the Greatest Common Measure of:—

(i.) £36 os. 4½d., £48 14s. 7½d., £861 7s. 4½d.

(ii.) 7½, 19⅔, 20¼.

(2) (i.) How many times is the difference between $\frac{2}{3}$ of $\frac{3}{4}$ and $\frac{2}{5}$ of $\frac{3}{4}$ contained in their sum?

(ii.) Show, with examples, how you can tell by inspection whether a vulgar fraction will produce a terminating, a pure repeating, or a mixed repeating decimal.

(3) Is the expression $\frac{19s. 3d.}{539d.} + \frac{712962 \text{ cub. ft.}}{2156 \text{ cub. in.}}$ an intelligible expression? Give a reason for your answer. If it be possible, find its value.

(4) 48 gal. of spirits at 12s. per gal., 2⅔ gal. at 10s. 6d. per gal., 19½ gal. at 1s. 4d. per gal., and 19⅔ gal. of water, are mixed together, and the mixture is sold at 7s. 10½d. per gal.; what is the gain per cent.?

(5) How much less than the true present value will a banker give for a bill of £570 drawn on 17th October at 4 months, and discounted on 9th December at 4⅔ per cent.?

(6) The 3 per cents. are at 96⅔, and the 3½ per cents. at 105.

What sum invested in the former would produce an annual income of £1 more than if invested in the latter, ¼ per cent. brokerage being charged on each investment?

(7) In what proportions could wines worth 15s., 20s., 26s., and 30s. per gal. be mixed, so as to give a profit of 14⅔ per cent. when the mixture was sold for 24s. per gal.?

(8) Find, to the nearest penny, the amount of £4,523 17s. 6d. in 4 years at 2½ per cent. per annum compound interest.

(9) The cost of papering the walls of a room 19½ ft. long, 17½ ft. broad, and 10 ft. high, with paper 1·6 ft. wide, is £3 16s. 6⅓d.; what is the price of the paper per yard?

(10) An open cubical cistern is lined with lead at 1s. 9d. per square foot, the total cost being £15 15s. What is the content of the cistern in cubic feet?

(11) If 45 men, 36 women, and 27 boys can do a piece of work in 50 days, how long would 27 men, 45 women, and 54 boys take to do four times as much, the amounts of work done in the same time by a man, a woman, and a boy being as 3 : 2 : 1?

(12) A cubic fathom of water weighs 6 tons, and a kilogram is the weight of a cubic decimetre of water. If 11 yards be equal to 10 metres, express a kilogram in lb. correct to 3 places of decimals. [1 fathom = 6 ft.]

Answers:—(1) 1½d.; ⅔d. (2) 1⅓. (3) Yes; 1. (4) 12½. (5) 10d. (6) £81,577. (7) 3 : 5 : 1 : 2, and in many other ways. (8) £4,993 10s. 2d. (9) 6d. (10) 216 cubic feet. (11) 208 days. (12) 2·237 lb.

Algebra.

(1) Simplify $\frac{1}{y(x-\frac{x}{y})} + \frac{1}{x(\frac{x}{y}+\frac{y}{x})} - \frac{1}{(\frac{1}{y}-\frac{1}{x})(x^2+y^2)}$.

(2) Show that if $f(x)$ be a rational integral function of x , the remainder after dividing $f(x)$ by $x - a$, will be $f(a)$. Hence find the factors of $2x^3 - 19x^2 + 27x + 90$.

(3) Solve the equations:—
(i.) $\sqrt{ax+b} + \sqrt{ax+c} = \sqrt{2(b+c)}$.

(ii.) $5x^2 + 6x + \frac{17}{5x^2 + 6x - 2} = 104\frac{1}{6}$.

(iii.) $x^2 + y^2 = 41, 2x + 2y = xy - 2$.

(4) Two trains, starting simultaneously from A and B, which are 150 miles apart, arrive at B and A respectively 4½ hours and 2 hours after passing each other. Find their rates of travelling.

(5) If $x \propto y^2z^3$, and if when $y = 3, z = 4, x = 36$, find y when $x = 250$ and $z = 25$.

(6) Two men start at the same time from the same point. One of them travels uniformly at the rate of 12 miles a day; the other does 9 miles the first day, and increases his rate by half a mile a day. In how many days will the latter overtake the former?

(7) Express with positive indices:—
 $\sqrt{\frac{x-y^2}{a^2b-5}} \times \sqrt[3]{\frac{a^2b}{x-1}} \div \left(\frac{x^3y}{a^2b}\right)^n$.

(8) Rationalise the denominator of $\frac{59}{\sqrt{7} + \sqrt{5} - \sqrt{3}}$.

(9) The 15th term of a geometrical progression is 36, and the 21st term is 4½. Find the 29th term, and the sum to infinity.

Answers.
(1) $\frac{x^2 + xy + y^2}{(x+y)(x^2 + y^2)}$. (2) $(x-5)(x-6)(2x+3)$.

(3) (i.) $x = \frac{(b-c)^2}{8a(b+c)}$. (ii.) $x = 4, -\frac{1}{5}, -18 \pm \sqrt{714}$.

(iii.) $x = 5, 4, -\frac{5 \pm \sqrt{57}}{2}, y = 4, 5, -\frac{5 \mp \sqrt{57}}{2}$.

(4) 20 and 30 miles per hour. (5) ± 2. (6) 13 days.

(7) $\frac{a^{\frac{1}{2}}b^{\frac{2}{3}}}{x^{\frac{1}{2}}y}$. (8) $(\sqrt{7} + \sqrt{5} + \sqrt{3})(2\sqrt{35} - 9)$.

(9) 29th term = $\frac{9}{32}$ Sum to infinity = $4608(2 + \sqrt{2})$.

Geometry.

(1) If a triangle and a parallelogram be on equal bases and between the same parallels, prove that $\frac{1}{2}$ represents the ratio of the triangle to the parallelogram.

If the middle points of any two sides of a triangle be joined, the triangle so cut off bears to the original triangle the ratio $\frac{1}{4}$.

(2) Show that the angle at the centre of a circle is double an angle at the circumference standing on the same arc.

O is the centre of a circle BCDE; A is a point outside the circle and ACB, ADE are straight lines such that BCE is an acute angle. Show that the angle COD and twice the angle CAD together equal the angle BOE.

(3) Prove that the opposite angles of any cyclic quadrilateral are supplementary.

ABCD is a cyclic quadrilateral; the angle ABC is bisected by a straight line BE meeting the circumference in E; if the side AD be produced to F, show that a straight line drawn through E and D bisects the angle CDF.

(4) A chord of given length slides round with its ends on the circumference of a given circle; find the locus of any fixed point on the sliding chord.

(5) The base BC of a triangle ABC is divided at D so that $m \cdot BD = n \cdot CD$. Prove that $m \cdot AB^2 + n \cdot AC^2 = m \cdot BD^2 + n \cdot DC^2 + (m + n) AD^2$.

(6) Similar triangles are to one another in the duplicate ratio of their homologous sides.

What ratio does the area of the regular hexagon inscribed in a circle bear to the area of the regular hexagon described about the same circle? Give proof for your answer.

(7) Prove that the middle points of two opposite edges of a triangular pyramid are coplanar with those of two other opposite edges and form a parallelogram with them.

(8) ACB is a right-angled triangle, CQ the perpendicular dropped from the right angle on the hypotenuse, QX, QY perpendiculars from Q on the sides. Express in terms of the hypotenuse C and the angle A only—
 (1) The length of CQ.
 (2) The area of the rectangle CXQY.

(8) What are strong and weak verbs? Give examples showing that the tendency of the language is towards making all verbs weak. Conjugate the following and classify as strong or weak:—freeze, sow, dig, wend, thrust, thrive, bid, shoe, knit, sing.

(9) What is meant by a figure of speech? Explain the terms, *metaphor*, *hyperbole*, *antithesis*, and *metonymy*. Give an example of each (from the poem you have been studying if possible).

(10) What is a ballad? Name some of the best-known ballads and quote a verse from any one.

(11) Write a brief sketch of the play or poem you have been studying during the Session.

History.

(1) Write short notes on *four* of the following:—Heptarchy, Danegeld, Constitutions of Clarendon, Domesday Book, The Peasants' Revolt, The Model Parliament, Lollardism, Star Chamber, Thirty-nine Articles, Act of Supremacy, Act of Uniformity, Petition of Right, Grand Remonstrance, Bill of Right, Act of Union 1707, Stamp Act, India Bill, Corn Laws.

(2) What were the general causes of dispute between the Church and the State in the Middle Ages? Give an account of the special points at issue in any one instance.

(3) Sketch the rise and progress of the Reformation up to the accession of Edward VI. Contrast with the Reformation in Scotland.

(4) What were the immediate causes of the War of the Roses, the Civil War, or the Seven Years' War?

(5) Account for the increase of the power of the Crown under the Tudors, or for the increase of the power of the Parliament under the House of Hanover.

(6) Give a detailed account of one of the following:—The coming of the Danes, Introduction of Christianity, the Crusades, the Reforms of Henry I., the discoveries of new lands in Tudor times, the Renaissance, the effects of the Restoration of 1660 on the social life of the period, the Indian Mutiny.

Geography.

(1) Give a general account of the physical features *either* of Scotland *or* of England and Wales.

(2) *Either* name the principal agricultural products of the United Kingdom, and mention the districts where each is chiefly cultivated.

Or name the various coal-fields and iron-fields in Britain. Indicate their locality and state the chief industries connected with each district.

(3) Give an account of the course of *two* of the following rivers: indicate the chief towns on the banks and their importance. If you wish, illustrate your answer by a sketch-map. Shannon, Rhone, Loire, Volga, Don (Russia), Indus, Brahmaputra, Congo, Paraguay, Amazon.

(4) State briefly what you understand by the following terms:—*longitude, zone, volcano, trade wind, bore, inland drainage, delta, relief of land.*

(5) Give a short account of *one* of the following as regards climate, means of communication, people and government:—Austria-Hungary, Turkey, Siberia, China, Cape Colony, Peru, New South Wales, Dominion of Canada.

(6) Indicate the position of *ten* of the following, and state any important facts you know about them:—Athens, Namur, Sedan, Stockholm, Gibraltar, Venice, St. Petersburg, Madras, Benares, Mukden, Vladivostok, Jaffa, Zanzibar, Port Said, Delagoa Bay, Dunedin, Ballarat, Vera Cruz, Chicago, Philadelphia.

(7) Give an account of the various routes—both land and water—by which goods might be conveyed from Newcastle-on-Tyne to Glasgow. Which do you consider quickest, which slowest?

Latin.

(1) Translate into English:—*Libenter Caesar, petentibus Haeduis, dat veniam excusationemque accipit quod aestivum tempus instantis belli, non quaesitionis, esse arbitratur. Obsidibus imperatis centum, hos Haeduis custodiendos tradit.*

SCOTCH LEAVING CERTIFICATE EXAMINATIONS, 1902.

Revision Test Papers.

LOWER GRADE.

English Grammar and Literature.

- (1) Write an essay on:—
 (i.) The voyage of the "Ophir"—extent, object, results.
 (ii.) Exhibitions—their origin and uses.
- (2) Paraphrase:—
 Earth has not anything to show more fair:
 Dull would he be of soul who could pass by
 A sight so touching in its majesty.
 This city now doth like a garment wear
 The beauty of the morning; silent, bare,
 Ships, towers, domes, theatres, and temples lie
 Open unto the fields and to the sky;
 All bright and glittering in the smokeless air.
- (3) Give a general analysis of the following and parse the words in italics:—*I now gave over any more thoughts of the ship, or of getting anything out of her, except what might drive ashore from the wreck, as indeed divers pieces of her afterwards did.*
- (4) Define with examples the following:—Antecedent, verb of incomplete predication, nominative absolute, accident, case, inflection, mood, phrase.
- (5) Distinguish between gerunds, participles and verbal nouns. Give two sentences illustrating the use of each.
- (6) Distinguish between:—elder and older, penny and pence, brothers and brethren, shall and will, later and latter.
- (7) What are the main phonetic defects of the English alphabet? Illustrate.

Eodem Carnutes legatos obsidesque mittunt usi deprecatoribus Remis, quorum erant in clientela: eadem ferunt responsa. Peragit concilium Caesar equitesque imperavit civitatibus. Hac parte Galliae pacata, totus et mente et animo in bellum Trevirorum et Ambiorigis instituit. Cavarinum cum equitatu Senonum secum proficisci iubet ne quis aut ex huius iracundia aut ex eo quod meruerat odio civitatis motus existat. His rebus constitutus, quod pro explorato habebat Ambiorigem proelio non esse concertaturum, reliqua eius consilia animo circumspectabat.

(2) Distinguish:—*ēdo, ēdo: lēgo, lēgo, ligo: deligo* (bis) *dilego: fūris, fūris: oblitus, oblitus: vās, vās: pōpulus, pōpulus.*

(3) Give genitive, gender and meaning of:—*Colus, pecus* (bis), *incus, pollex, supellex, auspex.*

Give acc. singular, gender and meaning of:—*Pelvis, femur, seges, heres, glacies, restis, merces.*

(4) Conjugate with meanings:—*Mentior, metior, mētor, mētor, frico, frigeo.*

(5) Illustrate by means of short sentences the difference between (a) *Tutus, securus, incolumis*, (b) *Aspectus, conspectus.*

(6) Translate into Latin:—

(a) He became a candidate for the censorship five years after he returned home.

(b) There can be no doubt that virtue alone can make men happy.

(c) It does not in the least concern me whether you adopt this plan or not.

(d) It would be tedious to tell everything we are going to do.

(e) The storm broke out December 18, 1901.

(f) He talks instead of acting.

(7) Translate into Latin:—As soon as Hannibal landed in Africa, the hopes of the Carthaginians revived and they looked forward to a favourable termination of the war. Hannibal, however, formed a truer estimate of the real state of affairs: he saw that the loss of a battle would be the ruin of Carthage, and he was therefore anxious to conclude a peace before it was too late. Scipio, who was eager to have the glory of bringing the war to a close, and who feared lest his enemies in the senate might appoint him a successor, was equally desirous of a peace.

French.

(1) Translate:—

(a) "Ecoute-moi bien, voici ce que tu vas faire: tu partiras immédiatement, en sortant d'ici, pour la ville; aussitôt arrivé tu te rendras chez l'imprimeur Maclou, tu lui remettras ces papiers et tu lui recommanderas de suivre à la lettre les instructions que je lui donne et surtout de faire diligence. Ah! en passant, dis à Topinard que je retiens pour jeudi soir la grande salle de l'auberge du *Cheval Blanc*." En achevant ces mots, il lui remit une enveloppe cachetée, lui glissa dans la main une belle pièce de cinq francs toute neuve et le poussa vers la porte.—E. Ganneron.

(b) Si quelqu'un nous blesse ou nous nuit,
Quelque grande que soit l'offense,
Laissons l'espace d'une nuit
Entre l'injure et la vengeance;
L'aurore à nos yeux rend moins noir
Le mal qu'on nous a fait la veille;
Et tel qui s'est vengé le soir,
En est fâché lorsqu'il s'éveille.—Panard.

(2) Translate into French:—He had not gone far from the gate before he heard the sound of a drum (*un tambour*), and to his great surprise, met a number of persons, sufficient to occupy the whole front of the street, and form a considerable mass behind, moving with great speed towards the gate he had just come from, and having in front of them a drum beating to arms.—Sir W. Scott.

(3) Write a short letter to your sister, who is in a school abroad, telling her how you spent your Christmas holidays.

(4) Of what gender are words ending in *-ment, -ier, -ière, -eau, -elle, -ence, -tion, -age*? Give two examples of each, and any exceptions you know.

(5) Parse the following parts of verbs, and give their infinitive and their present and past participles: *aïlles, naquirent, primes, meut, courrait, vintes, sus, nuit.*

(6) Write out in French: 16th, 26th, 75th, 99th; King Edward the VIIth ascended the throne on the 22nd of January, 1902.

German.

(1) Translate into English:—*„Die unverständigen Menschen!“—sagte der Bär zu dem Elephanten. „Was fordern sie nicht alles von uns bessern Thieren. Ich muß nach der Musik tanzen, ich, der ernsthafteste Bär! Und sie wissen es doch nur allzuwohl, daß sich solche Bessen zu meinem ehrwürdigen Wesen nicht schicken; denn warum lachen sie sonst wenn ich tanze?“ „Ich tanze auch nach der Musik,“ versetzte der gelehrige Elephant, und glaube ebenso ernsthaft und ehrwürdig zu sein als du. Gleichwohl haben die Zuschauer nie über mich gelacht; freudige Bewunderung bloß war auf ihren Gesichtern zu lesen. Glaube mir also, Bär, die Menschen lachen nicht darüber, daß du tanzt, sondern darüber, daß du dich so albern dazu anschließst.“—Lessing.—(Fabeln.)*

(2) Translate into German:—One morning, says Dr. Johnson, I received a letter from poor Goldsmith. He informed me that he was in great distress; and, as it was not in his power to come to me, he begged that I would come to him as soon as possible. I sent him a guinea (*Guinee, f.*), and promised to come to him directly. I accordingly went as soon as I was dressed, and found that his landlady had had him arrested for his rent.

(3) Give the nominative singular (with definite article), the genitive singular, and the nominative plural, of the German for the following words: *town, peace, roof, face, vision, gentleman, merchant, heart, statesman, visit.*

(4) Decline fully the German for: *the younger boy, our oldest friend, a Berlin house.*

(5) Compare and translate the following adjectives:—*nass, faul, gut, edel, gross, hoch, langsam, viel, wenig, rot.*

(6) Write down the "inseparable prefixes."

(7) Decline the interrogative pronoun *wer*, and the relative pronoun *der*.

(8) Write out in full the present and the imperfect indicative, and give the meaning of:—*thun, bitten, bieten, beten, gehen, begleiten, graben, helfen, stossen, treten.*

(9) Write out the whole of the perfect indicative of *gelingen* (to succeed).

(10) Give a list of the prepositions which govern both the dative and the accusative; and two sentences illustrating the double government of any one of them.

Arithmetic.

(1) (i.) How many ounces in 12 tons 7 cwt. 2 qr. 13 lb.?

(ii.) Reduce 2685814 sq. ft. to ac., ro., per., . . . sq. in.

(2) Find, by practice if you can, the cost of 306 ac. 1 ro. 32 per. at £31 15s. per ac.

(3) Among how many persons is £59 10s. 3d. divided when the share of each is £2 4s. 1d.?

(4) It costs £22 10s. to buy oats for 14 horses for 10 days when oats are 16s. 6d. per qr.; what will it cost to buy oats for 22 horses for 3 weeks when oats are 13s. 6d. per qr.?

(5) Resolve into their prime factors—420, 630, 1050, 1470; and find the lowest common multiple of these numbers.

(6) Simplify:—

(i.) $2\frac{7}{8}$ of $\frac{5}{8}$ - $8\frac{1}{4}$ of $\frac{3}{17}\frac{1}{4}$

$8\frac{3}{8}$ of $(\frac{1}{15} - \frac{1}{7})$ of $\frac{1}{10}$

(ii.) $12\frac{5}{8} + 4\frac{1}{16} + 1\frac{7}{14} + 2\frac{5}{4}$

(7) (i.) Divide '00103665 by 50'08.

(ii.) Reduce $\frac{2}{5}$ of £1 2s. 6d. + $\frac{1}{8}$ of $\frac{1}{3}$ of 4d. - $\frac{1}{3}$ of $\frac{1}{10}$ of 3s. 1d. to the decimal of £49 0s. 5d.

(8) A certain sum yields £104 1s. 9d. of interest in 3 years 9 months at 4 per cent. per annum. What is the sum?

(9) A spirit merchant mixes 4 gal. of whisky which cost him 15s. 3d. a gal. with 6 gal. which cost 16s. 11d. a gal. At what price per gal. must he sell the mixture to gain 40 per cent.?

(10) How many yds. of carpet 27 in. wide will be required to cover the floor of a room 21 ft. long by 17 ft. 6 in. broad? What will the carpet cost at 3s. 4½d. per yd.?

(11) A square field containing 40 ac. is enclosed at the rate of 1s. 8d. per yd. What is the cost?

(12) A man walks 38'25 decametres, then 25'3 hectometres.

then 175 decimetres, then 925 metres. How many kilometres has he still to walk in order that the total distance he has walked may be 5 of a myriametre?

Answers:—(1) 443728 oz.; 61 ac. 2 ro. 25 per. 7 sq. yd. 4 sq. ft. 108 sq. in. (2) £9,729 15s. 9d. (3) 27. (4) £60 15s. (5) 2².3.5.7. 2.3².5.7. 2.3.5².7. 2.3.5.7²; 2².3².5².7²=44100. (6) 1; 8².4871. (7) 0000207; 002. (8) £693 18s. 4d. (9) 22s. 9d. (10) 54¹/₂ yd.; £9 3s. 9d. (11) £146 13s. 4d. (12) 1'145 kilometre.

Algebra.

- (1) Find the H.C.F. of $11x^3 - 5x^2 + 7x - 13$, $12x^3 + 4x^2 + 3x - 19$.
- (2) Simplify: $\frac{x^3}{x^2 - 5x + 6} - \frac{4}{x^2 - 7x + 12} + \frac{1}{x^2 - 6x + 8}$.
- (3) Factorise: $-x^3 - 17xy - 84y^2$, $15x^2 - 29x + 12$, $9x^3 + 16y^2 - a^2 - 25b^2 - 24xy + 10ab$.
- (4) Find the square root of: $-4x^6 + 12x^5 + 37x^4 + 22x^3 + 19x^2 - 70x + 25$.
- (5) Solve the equations:—
 (i.) $\frac{2}{4x - 3} - \frac{1}{2x + 5} = \frac{8}{8x - 5} - \frac{1}{x + 1}$
 (ii.) $2x + 7y - 5z = 13$, $3x - 4y + 6z = 28$, $4x + 3y + 2z = 43$.
- (6) Rationalise the denominator of $\frac{5}{2\sqrt{7} + 3\sqrt{2}}$, and find

the square root of $11 + 2\sqrt{30}$.

(7) Two places A and C are 30 miles apart, and a third place B lies between them, at a distance of 12 miles from A. If a man walk from A to B and ride from B to C the journey takes him 4 hours 48 minutes; if he ride from A to B and walk from B to C it takes him 5 hours 42 minutes. Find his rates of walking and riding.

(8) A man's age is five times the united ages of his two children; in eight years it will be twice theirs. Find the father's age.

(9) A concert room holds 600 persons; if the number of benches in it were increased by four, then the number of persons on each bench would be diminished by five. How many benches were there?

Answers.

- (1) $x - 1$.
- (2) $-\frac{7}{(x-2)(x-3)(x-4)}$.
- (3) $(x - 21y)(x + 4y)$, $(5x - 3)(3x - 4)$.
- (4) $2x^2 + 3x^2 + 7x - 5$.
- (5) (i.) $x = \frac{10}{11}$ (ii.) $x = 4$, $y = 5$, $z = 6$.
- (6) $\frac{2\sqrt{7} - 3\sqrt{2}}{2}$, $\sqrt{5} + \sqrt{6}$.
- (7) Walks 4 miles an hour, rides 10 miles an hour.
- (8) 40 years old. (9) 20 benches.

Geometry.

(1) Shew that parallelograms are equal when they are on equal bases and between the same parallels.

Show how to construct a parallelogram on one side of a square such that its area shall equal half that of the square and its perimeter shall equal that of the square.

(2) Prove that the exterior angle of a triangle equals the sum of the two interior and opposite.

Let ABC be an isosceles triangle of which A is the vertex. Draw CF meeting AB produced in F so that CF=AC and draw BG meeting AC produced in G so that BG=AB. Let BG and CF meet in O. Shew that the angle BOC is thrice the angle at A.

(3) The greater angle in any triangle is subtended by the greater side.

Let ABC be an equilateral triangle and let a point Q be taken in BC produced in the direction B to C; shew that Q is nearer to A than it is to B.

(4) Prove geometrically that $A^2 + 2AB + B^2 = (A + B)(A + B)$.

(5) If A, B, C, D be four points on a straight line taken in order, prove that the rectangle AC·BD is equal to the sum of the rectangles AB·CD and AD·BC.

(6) The vertex of a triangle moves along the circumference of a circle while the base of the triangle is a fixed chord. What is

the characteristic property of the angle at the vertex? Prove your answer.

(7) Draw a tangent to a circle from a given point without the circumference. If the circle have a diameter of six inches and the point be five inches from the centre, what is the length of the tangent?

(8) Shew that equal chords in any circle are tangential to a smaller concentric circle.

RECENT SCHOOL BOOKS AND APPARATUS.

Modern Languages.

Rabelais, Gargantua et Pantagruel. Selections edited by E. C. Goldberg, M.A. 32 pp. (Blackie.) 4d.—It was a happy thought to include a selection from Rabelais in Blackie's "Little French Classics." The editor gives us a brief but good introductory note on "this giant of the sixteenth century," and some details about his most famous work. The selection of passages is judicious, and the notes and glossary give all needful help.

Le Loyal Serviteur, Bayard. Edited by W. G. Hartog. xii. + 73 + xxiii pp. (Black.) 1s. 6d.—This old account of the *Chevalier sans Peur et sans Reproche* has been well abridged and modernised, and furnished with some very good and some indifferent illustrations. It makes a capital reading book, especially as the general editor (Mr. Kirkman) has written valuable footnotes and headnotes. Mr. Hartog has supplied two pages of notes and an incomplete vocabulary; the publishers also issue the book without the latter, a welcome concession to teachers on reform lines. From the preface we learn that "oral exercises will be added to the text as soon as they have been worked out in the class-room."

Commercial French. By W. Mansfield Poole, M.A., and Michel Becker. Part II. x + 283 pp. (Murray.) 2s. 6d.—The good opinion formed by us on seeing Part I. is confirmed by this second instalment, really an admirable piece of work. We know of no better book to serve as an introduction to the more strictly technical study of commercial French. The reading matter is varied and interesting, the exercises and explanations are all in the foreign language, and the printing and paper are of the highest quality. We have noticed only a few insignificant slips.

H. G. Wells. La Guerre des Mondes, and Les premiers Hommes dans la Lune. 324 and 402 pp. (Société du Mercure de France.) 3f. 50c. each.—These novels, well-known to English readers, have been satisfactorily translated by M. Henry D. Davray. They might, with advantage, be bought for the school library and recommended to boys for their private reading. The narrative is so thrilling and fantastic that they will get through them very quickly, and incidentally improve their vocabulary a good deal.

A brief Sketch of French History, 1789-1815. By L. Guilgault. And *A brief Sketch of French History, 1815-1873.* By H. Hirsch. viii. + 144 pp. and viii. + 155 pp. (Blackie.) 1s. 6d. each.—These handy little books are primarily intended for students preparing for examinations under the Intermediate Education Board for Ireland. They are neat and clear, and will serve their purpose well. An occasional extract from a French historian would add to their value.

Kotzebue, Der geraae Weg der beste. Edited by J. H. D. Matthews, M.A. 47 pp. (Blackie.) 6d.—This is a bright little play, with a rather old-fashioned flavour. The editor has

added very brief notes and some exercises for retranslation. There should have been a note on *mit einer Citrone in der Hand* (p. 24), and on *Zinshühner* (p. 26); and the spelling should follow the new orthography more consistently. The "rough general rule" about prepositions with two cases (p. 39) is too rough to be of use.

German Vocabularies for Repetition. By Sophie Wright. vi. + 64 pp. (Methuen.) 1s. 6d.—In these vocabularies the words are arranged in groups according to the meaning, each group containing about a dozen German words and the English rendering, in parallel columns. Some teachers will be glad of such a book for purposes of revision. Unfortunately the proofs have hardly been read with sufficient care, and there are consequently numerous slips in the spelling, and a good many cases where for no obvious reason the plural of the substantives is not given. Why is *rot* given without *h* if it is allowed to remain in *Wirth* and *Rath*? Why should the plural of *Finger* appear, but not that of *Hers*? Why the plural of *Feuerzeug*, but not that of *Spielzeug*? These may be small matters, but to a child they are unsettling.

French Test Papers. By E. B. Le François. 126 pp. (Blackwood.) 2s.—So long as the examination in French for entrance into the Army (Woolwich and Sandhurst) is conducted on present lines, we suppose that such a book as this has a *raison d'être*. It will please the heart of the crammer, to whom, and to no one else, we recommend it.

Glück Auf. A First German Reader. By Margarethe Müller and Carla Wenckebach. ix. + 235 pp. (Ginn.)—A section on "English-German cognates" opens this book, with numerous examples. The comparison of English and German words at the very outset, as well as the presence of a German-English vocabulary (excellent as it is) makes the book unsuitable for "reform method" work. Those, however, who adhere to the translation method will find it convenient and trustworthy. The pieces for reading are mostly well chosen; there are satisfactory notes and a number of questions on the text to be answered in German. We miss a systematic treatment of the grammar; but perhaps the authors leave this to the judgment of the teacher. The book is excellently printed, and commendably free from slips. A purist might object to words like *Moment*, *populär*, *intim*; and here and there we find evidence of the American home of the authors.

F. Goebel, Hermann der Cherusker. Edited by J. Esser. xv. + 163 pp. (Macmillan.) 2s. (Word and phrase-book, and key to appendices, have also been issued.)—This is a capital addition to the elementary German texts in Mr. Siepmann's Series. The story of the great national hero Arminius is told in bright and simple German, and in a way which will interest boys and girls. The text covers 70 pages of fairly large type, and would suffice for a term's work. The notes give all grammatical help that is needed, and a good deal of interesting information about the subject-matter. We have noted a few corrections for the second edition: p. 7, l. 5, read *Siegmar*; there should be a note on *die Stäbe warf* (p. 11, l. 30); and a note on *deutsch* (p. 11, l. 11) would also be useful. *Onkel* in l. 3 on the same page sounds strangely modern. Such a name as *Bertwolf* (p. 41, l. 5) should be explained. In the note on p. 2, l. 29, *assonant* seems to be used for *rhyming*; not all numerals take a plural (note on p. 8, l. 8); the words given in the note on p. 11, l. 13, are actually compounds of *Alul*, with the exception of *Armut*. What is the meaning of "abstract" in the note on p. 28, l. 14? *Toga praetexta*, not *praetoria* (note on p. 33, l. 16). P. 37, l. 23, *lerne* is undoubtedly right; with *lehre* it would be *sich gewöhnen*.

Edited Books.

Anson's Voyage Round the World. By H. W. Household. 164 pp. English Classics for Schools. (Rivingtons.) 10d.—This volume consists of a reduced text, introduction, notes, glossary and maps, and the reduction has been done in a very reasonable way. Not too much of the text has been sacrificed, and in the forty sections to which the narrative extends there is a profusion of interesting incident included. To edit this particular volume is rather a happy idea, because Anson's "Voyages" is almost a classic, and yet has received much scantier recognition than is its due; in common with some other well-known works of the same nature, it has escaped the notice of editors of school books up to the present time. Mr. Household's introduction only fills five pages, but the notes and glossary are on a more extended scale, and the notes are full of accurate matter.

Carlyle's Heroes and Hero Worship. Edited by A. McMeehan. lxxxviii. + 396 pp. (Ginn.) 3s. 6d.—Eighty-eight pages of rather shapeless introductory matter, 281 pages of carefully edited and clearly printed text, and 115 further pages of notes, summary and a carefully prepared index, are comprised in this edition. Carlyle as a school-book is rather a new conception even in the shining example of his most popular series of lectures, and, to judge from the way in which Mr. McMeehan has handled his material, they must either have very precocious schoolboys on the other side of the Atlantic, or this volume must be intended for undergraduates rather than for other young persons *in statu pupillari*. To say the least of it, the work shows great editorial care, and a love and reverence for Carlyle, but the introduction would be all the better if it were recast, and if certain vaguenesses of expression did not reflect quite so much of Carlyle. When Mr. McMeehan talks of "the bisson conspiciuitates of niggling pedants," it is possible that his meaning is clear to himself, but for the rest of the world it is a hard saying; and who shall hear it? And when he tells us that Goethe "spoke a prophecy or ere he went," is he not rendering rhetoric ridiculous? Allowing for these and other magniloquences of style, there is much in the introductory matter which is well worth reading, but the turgid echo of Carlyle's peculiar habits of speech might be serviceably reduced in future editions to plainer prose. The notes are excellent, and introduce a student to many fields of enquiry. Carlyle's index is included in this volume, as are also his summaries of the lectures, and then an index to Mr. McMeehan's own part in the work swamps them both for voluminous detail.

Tales of Passed Times. Told by Master Charles Perrault. With twelve Illustrations by Charles Robinson. 92 pp. (Dent.) 1s. 6d.—This edition of Perrault's Fairy Tales is a thing to bring joy to youthful hearts. Slight as the volume is, there is a literary charm about it over and above its main substance, which is a series of versions of well-known fairy stories; for "Beauty and the Beast" appears in its pages. "Le Prince de Beaumont," and two other stories, less well known, "The Benevolent Frog" and "Princess Rosette" are by Mme. La Comtesse d'Aulnoy. The illustrations are beautifully executed. A splendid but inexpensive gift-book.

The Old Testament Narrative for Schools. Compiled, in the Words of the Authorised Version, by Marcus Dods, M.A. (Edin.), B.A. (Cantab). xx. + 532 pp. (Nelson.)—Many parents as well as teachers will be glad to put this volume in the hands of the children whose intellectual welfare they desire to promote. In its usual form the Bible is not regarded by the average boy or girl as a book full of interest, and only the exceptional child reads it of his own accord. By discarding

the division into verses, and setting out the narrative as it would be in any other literature, the apparent dulness of the book to childhood's eyes is removed and an attractive account of the history of a great people is presented. A number of volumes already exists in which this has been done, and Mr. Dods acknowledges his indebtedness to the "Eversley" edition of the Bible, which, however, occupies eight volumes of the series. The present volume differs from others of a similar kind in the fact that the compiler has omitted parts which it is undesirable to read aloud either in class or at home, and avoided the repetitions of ceremonial details and genealogical lists which confuse the youthful mind and are not essential to the narrative. Numerous headings have been inserted referring to the acts and incidents described, and they will facilitate greatly the study of the book. Footnotes are given here and there in explanation of a few words; and this fact leads us to suggest that a valuable help would be a glossary of such words at the end of the book. There are no other notes, but we can almost forgive Mr. Dods for this omission, as he has given us in one volume an edition of the Old Testament which will encourage its literary study in school and among general readers. The late Bishop of Calcutta contributes a prefatory note in appreciation of the book.

The Book of Psalms (XC.-CL.). With Introduction and Notes. By A. F. Kirkpatrick, D.D. Cambridge Bible. (Cambridge University Press.) 2s. 6d.—The Cambridge Bible for Schools is now so well known and so excellently reputed that nothing can be said upon any volume of it that does not swell the general chorus of approbation. The editing of The Psalms has, however, been a matter of more detailed labour than that of some other volumes in the series, because the work has been done in three divisions, and three volumes of considerable bulk, and accurate, painstaking scholarship have been the result. It is with the last in point of order that we have now to deal, and the more this volume is examined the more do Professor Kirkpatrick's learning and discrimination become apparent. The volume deals with the last sixty poems in the wonderful Hebrew anthology, which it is so much more easy (and disrespectful) to think of as merely *The Psalter*. To these sixty poems the editor has prefixed a complete and scholarly introduction; the section of which dealing with the authorship and age of The Psalms is of intense interest. Another chapter dealing with the growth of The Psalter is full of fruitful suggestions. Strictly theological topics come in for discussion in the chapter devoted to the "Messianic Hope," and the statement of some further points concerned with kindred topics in the succeeding section is worth much attention. The vexed question of the Imprecatory Psalms in particular is dealt with in a most thoughtful, broad, and well-considered way. A valuable guide to the literature of the subject is supplied at the end. The notes are splendid. In all three volumes this version of The Psalms will be found of service not only to examination candidates and to theological students (who indeed, for purposes of ordinary scholarship, could hardly use a better), but it deserves to be studied by those general readers who fortunately in many cases are devout enough to desire to understand The Psalms and literary enough to reject any purely homilistic or doctrinal interpretation of them. To all such this edition will speedily become indispensable when once its study has been commenced.

English.

Lessons in Elementary Grammar. By G. A. Mirick, A.M. xv. + 155 pp. (New York: The Macmillan Co.) 2s. 6d.—We confess to a feeling of disappointment in the perusal of this book. We have been unable to account for its comparatively

high price by the discovery of any features of surpassing merit. There are several books published on this side of the Atlantic that are as suitable for training a person "in every-day life needs for the proper understanding and use of his own language," and are at the same time cheaper. The "lessons" are clear, and the exercises are useful, but they do not differ much from many at present in use in our secondary schools. On two points we disagree with Mr. Mirick: on p. 72 he implies that *this* in "This is the best book" is a demonstrative pronoun; we prefer to call it a demonstrative adjective, being of the opinion that the term "demonstrative pronoun" should be restricted to such words as *that* in "The skull of a negro is harder than *that* of an Englishman"; and secondly, we do not like the use of the term "prepositional adjectival phrase." It is stated on p. 116 that a phrase may be prepositional because it contains a preposition, and at the same time it may be adjectival, &c., according to its use. It is surely better to teach a boy that a prepositional phrase is one that has the functions of a preposition, e.g., *for the sake of, by reason of, &c.* Mr. Mirick would parse *of gold* ("a cloth of gold") as a prepositional adjectival phrase. Why not call it, simply, an adjectival phrase?

Composition and Rhetoric for Higher Schools. By Sara E. H. Lockwood and Mary Alice Emerson, B.A. vii. + 470 pp. (Ginn.)—During the past three years we have reviewed in these columns many books on English composition, and it is in many respects instructive to note the large proportion of American text-books that have been found worthy of commendation. The book now before us furnishes one more proof of the thoroughness with which the subject is treated in American schools of all grades. Teachers in training colleges and those in charge of the higher forms of our secondary schools, as well as private students, will find the present volume of considerable value. We do not remember to have seen before the use of pictures in a text book on composition, but every teacher will appreciate the possibilities of this aid to the imagination. This, however, is but one of many excellent points in the book's favour; the authors have produced one of the most helpful manuals we have seen.

History.

The Britannia History Readers. Introductory Book, 158 pp., 1s.; Book I., 208 pp., 1s. 3d.; Book II., 255 pp., 1s. 6d.; Book III., 224 pp., 1s. 6d.; Book IV., 255 pp., 1s. 6d. (Arnold.)—These Readers are far and away the best of their kind within our knowledge. The Introductory book consists of stories from British history, the first and second books tell the history of our country from the beginning till 1837, the third is occupied with the reign of Queen Victoria. They are all excellent, both in text and illustrations. Many of the latter are reproductions of classical pictures by Turner and other masters. There are a few points in which the knowledge is not quite up to date—we still have, e.g., Morton's Fork and "Praise God Barebone"—but they are very few and comparatively unimportant. The constitutional history is correct so far as it goes, and above all, there is a true appreciation of the religious question in the seventeenth century. But we reserve our best welcome for the fourth book, which, under the title of "Men and Movements in European History," is, so far as we know, the first attempt to introduce Europe as a subject into such text-books for schools. We very heartily commend the whole series.

First Makers of England. By Lady Magnus. x. + 136 pp. (Murray's Home and School Library.) 1s. 6d.—Julius Cæsar, King Arthur and Alfred the Great are the persons whom Lady Magnus considers to be included under her title. This is in

itself sufficiently astonishing, and the perusal of the book does not lessen our astonishment. Julius Cæsar's visits of 54 B.C. (*sic*) and the following year are made to a country called indifferently England and Britain, and are represented as having an influence on its history far beyond what has hitherto been claimed even by the most advanced of "Romanisers." Arthur is represented through the haze of Malory and Tennyson. The account of Alfred follows on the now familiar lines. There are five good photographs, three of which illustrate "Alfred." The other two are a bust of Julius Cæsar and the Roman forum.

Fathers in the Faith. By M. C. Dawson and F. G. Crawford. vi. +96 pp. (Methuen.) 1s. 6d.—A short account of nine "early" Fathers and of S.S. Ninian and Columba, written in a pleasant and easy style, from a strictly orthodox point of view, by two ladies belonging to the Episcopal Church in Scotland.

Problems and Exercises in English History. Book G, 1688-1832. By J. S. Lindsey. (Heffer.) 2s. net.—This volume is one of a series of eight which, when completed, will cover the whole course of English history. The one volume of the series previously published (Book B, 1399-1603) was reviewed in these columns in August, 1901. The book under notice opens with a brief sketch of the period 1688-1832. The outline which it presents is cleverly drawn and fruitful in suggestions. None can fail to see that it is the work of a writer who has a thorough mastery of his subject. Next comes a bibliography, and to our thinking this is by far the most valuable feature of the book. It is remarkably full, occupying no less than seventeen closely printed pages. It deals with authorities on the teaching of history, on general English history, on the special period, on the leading topics and aspects of the period; and in addition it gives a fairly complete list of relevant biographies and historical novels. This bibliography alone, admirable in arrangement, is worth the price of the book to the serious (and advanced) student. Finally, come the "problems and exercises" which give the name to the volume. These consist of sixty typical questions followed by model answers. The answers show the same intimate acquaintance with the era which marked the introductory sketch, and a happy skill in statement. Our only adverse criticism of this very sound piece of historical work is that its three parts are adapted to students in very different stages of progress. The "problems" provide peptonised food for the historical infant; the "sketch" is rather a stimulant to the fairly mature young man; the "bibliography" furnishes a continual feast for the specialist. In other words, the first is suited to pupils, the second to teachers, the third to advanced students. The one who needs the first could not possibly have any use for the third.

Geography.

Descriptive Geography from Original Sources. North America. By F. D. & A. J. Herbertson. xxxvi. + 252 pp. (Black.) 2s.—Until quite recently attempts to give vividness and interest to the teaching of geography in this country by the use of travellers' and explorers' accounts of the countries they had visited had not been made. Some months ago we had the opportunity of drawing attention to an anthology of African journeys and discoveries; the author, Mr. Webb, succeeded in producing a very interesting and useful book. Messrs. Herbertson have in certain respects improved on his plan. In particular, we think the addition of a bibliography is a distinct improvement; the teacher will have no difficulty in knowing where to turn for illustrative material for his lessons. The book before us contains extracts from the publications of several geogra-

phical societies, and from many other trustworthy sources. Another commendable feature is the introduction by Dr. Herbertson, consisting of a summary sketch of North America; in this way there is no danger of the pupil's losing sight of the wood on account of the trees. A boy who has studied this book will have no difficulty in passing any of the usual examinations, but that is little in its favour; he will gain an insight into the conditions that largely determine man's life and occupations; and it is on these grounds that we recommend the use of Messrs. Herbertson's "Reader."

Europe. 176 pp., 16 coloured maps, illustrated. (Blackie.) 1s. 6d.—Of late there has been a distinct improvement in Geography Readers. Messrs. Blackie's "Europe" in their "Illustrated Continental Geography Readers" is equal to the best of them. Certainly the claim made for them, that they give a clear and vivid general view of each continent, is substantiated by the volume we have received.

Science and Technology.

A Textbook of Zoology. By G. P. Mudge, A.R.C.Sc.Lond., F.Z.S. viii. +416 pp. (Edward Arnold.) 7s. 6d.—As there is no preface to the book, we are left in some doubt as to the class of readers which Mr. Mudge had specially in mind. The dozen animals selected for treatment are practically those prescribed for study in the Intermediate Science syllabus of London University, but they are described in considerably more detail than is necessary for the purposes of that examination. The "type" system, which is here adhered to, is perhaps the best means of introducing zoology to the beginner, since it focuses his attention upon the animal as an *individual*. It has its dangers, however, which can only be avoided by early emphasising the great structural diversity found in even closely-related animals. The student capable of appreciating the best features of this book will, we think, have already outgrown its method of treatment, and will find it useful as a book of reference rather than as a text-book. The chapters on heredity and variation are especially good. Mr. Mudge displays a refreshing broadness of view, and the information is well up to date. The 100 illustrations are models of their kind. We notice a few misprints, e.g., *nitrate* for *nitrite* (p. 17), *carbon dioxide* for *carbon monoxide* (p. 81), and *corporum* (adiposum) for *corpus* (p. 183).

Practical Histology. By J. N. Langley, M.A., Sc.D., F.R.S. viii. +340 pp. (Macmillan.) 6s.—The essentially practical character of the book is apparent throughout. Opening with a lesson on the use of the microscope, it proceeds to the examination of the tissues in order of increasing difficulty. The details of technique—hardening, staining, imbedding, section-cutting and mounting—are described in clear and concise language, and every precaution appears to have been taken against the thousand-and-one pitfalls which beset the path of the inexperienced student. Prof. Langley has wisely abstained from burdening the book with alternative methods. Instructions for the preparation of hardening-solutions, stains, &c., are given in an appendix. It is somewhat unfortunate that this excellent manual contains only three illustrations. The student who works with a demonstrator at his elbow is of course independent of figures. Others, less fortunately situated, will require to supplement the book with a histological atlas.

A First Course of Practical Science. By J. H. Leonard, B.Sc. 132 pp. (Murray.) 1s. 6d.—This volume is included in the publisher's "Home and School Library," and is suitable for use in preparatory classes. The syllabus of the experimental work described includes:—Decimals; measurements of length, area, volume and weight; centre of gravity; the lever; buoy-

ancy; specific gravity; the barometer; and elementary experiments in heat, solution, and distillation. The experiments are described in a thorough manner, and every encouragement is given to the young student to think about the phenomena observed. The book would be rendered more attractive, and in certain cases more useful, by the insertion of more illustrations (only thirteen are given) and of more sub-headings to the various sections. One experiment is described (p. 32) in which the student is instructed to take a balance to pieces in order to study the mechanism: this is decidedly novel, and probably destructive to the balance. The "maximum density of water" is a difficult experiment for absolute beginners, and it is doubtful whether the apparatus described on p. 106 would work satisfactorily. Also, in the experiments on solubility, it would be more in accord with the true meaning of the term if the experiment was arranged so as to determine the weight of any solid dissolved in 100 grams of water (instead of in 100 c.c. of the solution). A redundancy appears on p. 59 in the expression, "We should only have had to have found." The book is excellently printed, and is produced in a very handy form.

Wireless Telegraphy. By G. W. de Tunzelmann, B.Sc. 104 pp. (The Office of "Knowledge.") 1s. 6d.—This volume is based upon a series of papers which were recently published in "Knowledge," with the addition of two chapters on the latest forms of the Marconi system. The earlier chapters are devoted to a description of the systems of wireless telegraphy based upon electro-magnetic induction, followed by an explanation of "Ether and Ether Waves" and various "Mechanical Representations of Electric Actions" (adapted from Lodge's "Modern Views of Electricity"). Although written for the instruction of the uninitiated, the volume is sufficiently thorough to demand close attention even from the scientific reader. It is excellently written and well illustrated, and it can be strongly recommended as a concise and accurate statement of our present knowledge of the subject.

The World of Animal Life. Edited by Fred Smith. 414 pp. Frontispiece and 216 illustrations. (Blackie.)—This is just the kind of book to encourage the study of animal life; it is simply written, but not childish; it devotes sufficient attention to curious characteristics and hunting incidents that appeal to boyhood nature, and it deals with common British wild and domestic animals, as well as those of other regions. We should like to see the book on the shelves of every school library, and in the possession of every juvenile naturalist, for it will promote a healthy interest in outdoor nature in all who read it. What we particularly like is the instructive way in which animals easily found or observed are used as examples of various types. To young teachers in rural schools and the pupil interested in animal life, the book should be a source of inspiration.

Mathematics.

An Elementary Treatise on the Calculus. With Illustrations from Geometry, Mechanics and Physics. By G. A. Gibson, M.A., F.R.S.E. xx. + 460 pp. (Macmillan.) 7s. 6d.—The author has, we think, succeeded in accomplishing a very difficult task. The first principles of the infinitesimal calculus are very subtle, and abound with difficulties which cannot even be explained to a beginner; while, on the other hand, it is essential that the fundamental notions and theorems should be expounded in a form which, although provisional and incomplete, is sound and thorough as far as it goes. Professor Gibson's conscientiousness and wide mathematical knowledge have happily preserved him from charlatanism; and his teaching experience has enabled him to put the main propositions with

all the simplicity and clearness that is consistent with thoroughness. By frankly accepting the sufficiency of geometrical intuitions, the analytical refinements of the subject have been avoided; and the practical importance of the calculus has been illustrated by a wealth of applications, ranging from geometry to thermodynamics. The examples are excellently chosen, and include many important results (for example, the second theorem of mean value in the integral calculus), which would otherwise have had to be omitted for want of space. An unwelcome feature in recent mathematical text-books is their tendency to enormous bulk; and the size of Professor Gibson's book is, at first sight, a little alarming. But it is difficult to see how the author's plan could have been carried out in less room, except by the omission or curtailment of the preliminary chapters (pp. 1-60), which really form an elementary course of plane analytical geometry. The fact is that the book appeals to a student of fair mathematical capacity, unacquainted with calculus, but able to read and appreciate a careful and detailed discussion; and to such a reader, especially if he has no teacher to consult, the help given in the way of comment and illustration will be very valuable, and he will not complain of the extra amount of reading required.

Miscellaneous.

Illustrations and Notes to Accompanying Circular on Primary Drawing. (Board of Education, London.) 4th ed.—This publication consists of twelve annotated plates designed to form a typical course of instruction in primary drawing with pen or pencil, and also with the brush. The illustrations are all drawn by Mr. Walter Crane, and it is as pleasant as it is unusual to find such fresh, vigorous, and graceful work in a book on elementary drawing. Our first feeling on going through the pamphlet is one of relief; how much better this is than what we are accustomed to! Here is the work of a master hand to put before the young beginner, and not the humdrum, everyday performance of an over-tired drawing-master. On second thoughts, however, the very conspicuous merits of the publication seem rather to make it less fit for its avowed purpose. The birds, beasts and inanimate objects which look so attractive and so simple on Mr. Crane's plates would, many of them, prove lamentably difficult to the young student; the picturesque plough, for example, on Plate I., drawn without any guide lines, would be a very different thing when copied by an unpractised hand. Again, the very freedom of the facile drawing, charming as in itself it is, is quite like to encourage a kind of slovenly slap-dash in the tyro already inclined to think he knows all about it. It seems a pity that so able and interesting a production should not be better adapted to further the ends which it has in view.

We had hoped for real help in the teaching of elementary drawing. The book on that subject is still to seek, but what we have here will be very useful to those exceptionally clever teachers who can adapt Mr. Crane's teaching to the needs of the elementary student.

What's What: a Guide for To-day to Life as it is and Things as They are. By Harry Quilter, M.A. xii. + 1,182 pp. (Sonnenschein.) 6s. net.—In testing the efficiency of this book as a *vade mecum*, we have been disappointed as well as pleased. A volume of this kind, like a dictionary, must provide an answer to a reasonable inquiry, or it fails of its purpose. Unfortunately, the principle which has guided Mr. Quilter in the selection of topics is not very clear, and the compression towards the end of the alphabetical order suggests that considerations of space have determined the number of matters to be dealt with rather than the intrinsic importance of the subjects. Among the subjects of educational interest on which we find the *ipse dixit* of Mr. Quilter or his coadjutors are public schools—each

of the great schools being presented with its merits and disadvantages; education, in many aspects; examination, kindergarten, study of languages, drawing, universities, grammar schools, Civil Service, and numerous other topics; but if the book is examined from the point of view of the general knowledge-paper it is often found wanting. For example, there is no explanation of Betterment, Blocking a Bill, Caucus, Chauvinist, Cinque Ports, Darwinism, Demyship, Scholarship and Exhibition (what are the differences between these three?), Fata Morgana, Fives, Longitude, Morganatic Marriage, Senior Optimes, Wrangler, Plan of Campaign, pre-Raphaelitism, Recidivist, the Rubicon, Sloyd, Tammany, Ultramontane, and many terms of this kind included in general knowledge examinations. It would have been to the advantage of the book if much of the present contents had been omitted or abridged in order to make room for descriptions of such subjects as those we have mentioned.

CORRESPONDENCE.

The Editors do not hold themselves responsible for the opinions expressed in letters which appear in these columns. As a rule, a letter criticising any article or review printed in THE SCHOOL WORLD will be submitted to the contributor before publication, so that the criticism and reply may appear together.

Artificiality in School Mathematics.

I HOPE you will allow me to enter a protest against a passage in your February number, viz.: "As the representatives of the traditional sequence of subject matter in school mathematics have not taken up the defence of the existing machinery, it must be assumed that they are either indifferent or cannot give substantial reasons against the proposed changes."

I venture to submit that the silence of the great body of mathematical masters gives no foundation for any such assumption. So far as I know, no invitation has as yet been given by the Committee for them to express any opinion.¹ The letter you publish has been written in response to an invitation from one of that body. There is no indication to whom the invitation was sent, or what the terms of the invitation may have been. The gentlemen who have signed that letter would not, I feel sure, make any claim to have acted as representatives of the opinion of schoolmasters as a body. A glance at the list will show that, except in the case of two schools, they do not appear to represent the body of opinion at the schools from which they write. The letter, therefore, appears to be only of value as representing their views as individuals.

Now for individuals, or bodies of men, who advocate any particular change, this is the time to push that change to the front. For those whose policy it may be to oppose the proposed changes, it will be the right time to express an opinion when it is known which of the many changes advocated are to be seriously considered by the Committee of the British Association. Though some members of that Committee have indicated an impatient contempt for the intelligence and open-mindedness of mathematical teachers as a body, which I con-

sider wholly undeserved, it is not conceivable that that Committee would propose radical changes in the whole system of elementary mathematical teaching in this country, and endeavour to enforce it—as you suggest—by bringing the weight of their influence to bear upon examining bodies, without taking into their earnest consideration the opinions of representative teachers. Presumably they will take steps to obtain the opinions of men representative of every school of thought, and of tried experience in the education of youth. Such men as these are not likely to spend their time in fighting shadows: they will wait until definite issues are put before them, and they will then be found perfectly capable of giving substantial reasons for or against any proposed change which may be submitted to them. An experience of nearly forty years, man and boy, convinces me that there is no body of men against whom a charge of indifference to the highest interests of their profession can less fairly be brought. The mathematical master in the majority of schools is hampered in many ways, but in my experience there is no class of masters more anxious and willing to take advice, more persistent in their efforts to adapt their teaching to the capacity of their pupils, more ready to adopt any plan which the experience of a colleague has shown to be beneficial in the training of his pupils. It is important to remember that the only experience which can be regarded as final is the experience of teachers whose work is exactly similar in character as regards material, as regards the aim of their work, as regards the conditions under which their classes are formed, and the time and encouragement given to the subject.

If you can afford me space, I should like to add a few words on the general subject.

It may help to clear our minds if we realise that the whole enquiry may be divided into two distinct heads.

(1) How may the teaching of certain facts and methods connected with mathematics be most successfully undertaken without undue prejudice to the education of the schoolboy? This may, I think, be safely relegated to the consideration of the teachers of our engineering classes, who might perhaps think it wise to attempt to carry out Professor Perry's syllabus, reserving to themselves the right so to modify and rearrange it as may be suggested by experience in the teaching of boys.

(2) What are the shortcomings of our present system of mathematical education, properly so-called, which have led to a widespread feeling that it is inefficient in its results and repellent in its methods? This charge is a very serious one, and it is one which no thoughtful teacher can receive with indifference. Personally I am quite willing to admit that there is some justification for it, but it requires very careful thought to find a remedy. The first step is to find the cause.

I have studied carefully the "Discussion on the Teaching of Mathematics," and it seems to me that all the charges brought against the present system as regards division (2) of our subject may be summed up by the one word "artificiality." We are bound down by artificial limitations, and, do what we will, so long as these are maintained we cannot be thoroughly efficient, and we find it hard, though not so impossible as many of our critics represent, to be moderately interesting.

In quite elementary work this artificiality is chiefly due to the want of originality in pass examiners. These copy one another with such wearisome reiteration that every novel question has instantly to be represented by bookwork. Our text-books consequently contain ghastly chapters on "clock problems," and on every conceivable form of simplification of fractions, with an appendix to include a mass of examples suggested by some original question which has appeared since the last edition came out.

To my mind, the most serious form of artificiality is arbitrary limitation as to the methods to be used. In elementary work

¹ Mr. Hawkins is correct in the view he takes of the letter sent to the British Association Committee by twenty-three masters in public schools. We are in the position to state that the Committee has not invited expressions of opinion from any body of teachers. It was, of course, quite permissible for one of the members to invite a statement of views from practical schoolmasters; but the invitation and the response must be regarded as of the nature of individual actions, and no more than this is implied in the letter.—Editors, THE SCHOOL WORLD.]

this principally takes the form of insisting on arithmetic or algebra being used for the solution of a particular problem, without regard to the suitability of the method insisted on. For higher work the arbitrary exclusion of the Calculus from questions which can best be done by use of it is deplorable. It is pitiable to take a clever boy who is fitted to go on to higher branches, and spend perhaps two years with him, grinding him up in methods of doing questions by disguised differential, in order that he may obtain thereby a scholarship at the university.

Another form of artificiality, and the one which is hardest to combat, is the continued use of Euclid's order and postulates in elementary work. Much has been written about this on both sides. My own opinion is that much better results could be obtained by an authoritative and judicious reform of the postulates and sequence of propositions than in any other way. That some authorised sequence is necessary is abundantly proved by the existence of a text-book in which converse propositions are alternatively proved by assuming the converse. The idea of picking out certain propositions as landmarks, and assuming the rest, is to me most repugnant. I cannot believe that such a course would be satisfactory to the "average boy." I would suggest, in the first place, that the postulates be amended to include all purposes for which modern instruments are ordinarily used. I would then alter the sequence so as to admit at once some of the properties of the circle. These properties are much the most interesting to the average boy, and his first instinct when asked to do a rider is to fly to them, although he knows nothing about them. Give him Prop. I. to start with, then III. 27, 28, 29, by superposition, let him prove by the same method that in circles of equal radii the semicircumferences are equal. I. 15 follows at once. In equal circles if the arcs AB , $BC =$ the arcs $A'B'$, $B'C'$, then the various angles of the triangles ABC , $A'B'C'$ are equal respectively. Show him that the same facts are true for arcs, &c., of the same circle, and I. 5 follows at once. Drop out all propositions which are only useful as lemmas, e.g., I. 7, and perhaps III. 23 and 24. Introduce some of the propositions of Book IV. as you go along, interest will be kept awake, and the use of instruments for their legitimate purpose will be encouraged. The amount of numerical verification to be used may safely be left to the teacher, who must never allow a boy to confuse verification and proof.

As regards the theory of parallels I have never seen a method of treating the question which I liked as well as Euclid's. The average boy finds no difficulty in understanding and accepting axiom 12 if it is explained to him as a sequel to I. 28. He may not be able to quote it, but that is a different thing.

The second book is, in my opinion, most useful for the purpose for which it was intended, to prove certain elementary theorems in the theory of numbers which boys as a rule have learnt to apply without proof. The restriction as to the use of the minus sign should be abolished.

The point to be aimed at all through is the abolition of artificiality, without leaving gaps or departing from logical sequence. Take geometrical and analytical conics together, therefore, rejecting either method whenever the other is distinctly preferable.

In conclusion, let us not forget that one great object of education is to strengthen weak points as well as to develop strong ones. Let us teach our pupils to surmount difficulties, not to be always dodging round them. By all means let us do what we can to smooth away unnecessary obstructions in the path of knowledge, but do not let us try to conduct the young learner along it in a motor car.

Haileybury College,

CECIL HAWKINS.

February 10th.

Euclid in Schools.

IN the schools of to-day, owing to the multiplication of subjects—scientific, technical and modern—the time devoted to each subject, and in particular to mathematics, is a minimum, and consequently it is imperative that all unnecessary prolixity should be removed. The general desire to replace Euclid by a more concise introduction to elementary Geometry has arisen mainly for this reason.

Now clearly, in the majority of schools, such a step can only be taken subsequent to corresponding decisions by the various Boards of Examinations. The important question at the present time is not so much "Shall Euclid be superseded?" as "What is to take the place of Euclid?" It is clearly impossible for the majority of the teaching profession to accept the dictum of any one teacher with all his peculiarities. On the other hand, for each master to provide a special geometrical groundwork for his pupils is to render Geometry a science of time, place and eccentricity.

It is most essential that elementary Geometry shall not be allowed to drift into the present state of Geometrical Conic Sections, in which subject every text-book has its own particular sequence, the riders of one book being the propositions of another, and most propositions set in an examination can be done with ease by the reader of Besant or Taylor, and with difficulty by the reader of Taylor or Besant.

The want of an authoritative basis and sequence in Conics is strongly felt; *a fortiori*, would it be so in elementary Geometry? I doubt amid the multitude of books if any mathematicians have a clear, comprehensive grasp of Conics comparable with their conception of the logic of geometry as obtained from Euclid. (Conic Sections needs its Euclid). For Euclid, however faulty and old-fashioned, cramped in idea and oblivious to common-sense, furnishes at least a basis to the science of geometry, and it should be superseded only by some system of elementary geometry clearly less faulty, more logical, and of equal authority.

Euclid gone, how is elementary Geometry to escape the chaos of many books and individual ideas?

There is one solution to this question. A committee of responsible mathematicians, men of authority on the subject, might be formed to decide these points:—

(1) The axioms and postulates of geometry.

(2) A general principle of sequence.

(3) Those propositions which are of first importance and quotable.

This would bring the subject into a practicable form. On such an authoritative basis those who will write books could do so on the same main principles.

Teaching would thus escape the confusion of many different books, or, on the other hand, a narrow submission to the eccentricities of a chosen book or of the teacher himself, and examinations would be set on a subject rather than on a text-book.

A. CLEMENT JONES.

Bradford Grammar School.

THE letter addressed by a number of mathematical masters in public schools to the Committee appointed by the British Association to consider improvements in the teaching of mathematics contains many suggestions which, surely, all mathematical masters will gladly endorse; but are they not too timid in their attack upon Euclid?

We are already many years behind other countries in our methods of teaching geometry, and this is due in great part to our reluctance to abandon our beloved Euclid. We can never hope to make up these arrears by merely tinkering with Euclid

—dropping a proposition here, changing the order of propositions there, and postponing the reading of a particular book until some of its propositions are required to prove one in another book.

Of course, there are serious difficulties in the way of any more sweeping reform, of which, I suppose, the most obvious is that of deciding upon what order should be followed, since there will be many authorities who will loudly advocate their own particular schemes.

But the change must be made some time, and why not now? If this Committee contents itself with dodging the difficulties, we shall find that the more progressive of our teachers will very soon cut themselves adrift from the public examinations and adopt one or other of the American text-books, which are easily obtainable.

This result I, for one, should be sorry to see, and should greatly prefer to find that a sufficiently up-to-date scheme is brought forward by the Committee of the British Association.

FRANK M. KINGDON.

The College,
Bishop's Stortford.

Historical Novels for Period B.C. 55—A.D. 1066.

WOULD it be possible for you to supplement the list of historical novels in the December number of THE SCHOOL WORLD, which cover period 1066-1399, with another list which would cover period B.C. 55-1066? This, with the list given in December, would cover the whole of the period for the Cambridge Local next Christmas, and, I think, would prove useful to other masters and myself preparing pupils for the Locals.

HAROLD G. HALL.

Battersea Grammar School,
St. John's Hill, S.W.

One or two of the lists of historical novels cited in our December issue begin at 1066. In addition to the thirty older books contained in Mr. H. C. Bowen's "Descriptive Catalogue of Historical Novels and Tales" (Stanford, 1882, 1s. 6d.), the following may be mentioned:—

ROMAN PERIOD.—H. Elrington,* "A Story of Ancient Wales" (Caradoc); G. A. Henty, "Beric the Briton" (Boadicea and Nero); L. M. P. Black,* "For His Country's Sake" (South-west Britain and Rome, *temp.* Trajan); A. J. Church, "The Count of the Saxon Shore" (Departure of the Romans).

EARLY ENGLAND.—Gertrude Holles,* "The Son of Ælle" (King Edwin, 616-628); Sir Clements Markham, "The Paladins of Edwin the Great" (introducing Muhammad); Charles W. Whistler, "A Thane of Wessex" (Viking Raids, c. 845); and "Wulfric the Weapon Thane" (S. Edmund and East Anglia).

ALFRED'S REIGN.—Annie L. Gee,* "A Door of Hope" (866-879); Mary H. Debenham,* "Keepers of England" (879-901); Gordon Stables, "'Twill Day Dawn and Light"; Paul Creswick, "In Alfred's Day, a Story of Saga the Dane"; G. A. Henty, "The Dragon and the Raven"; E. Gilliat, "God Save King Alfred."

DANISH CONQUESTS.—Robert Leighton, "Olaf the Glorious" (down to the Battle of Svold); Charles W. Whistler, "King Olaf's Kinsman" (Olaf Tryggvason and Knut).

THE ENGLISH RESTORATION.—Mary M. Davidson, "Edward the Exile" (Wanderings all over Europe of a son of Edmund Ironside); D. Ryle Griffiths, "Elgiva, the Daughter of a Thegn" (Godwine's Sons); E. S. Holt, "Behind the Veil"; Emma Leslie, "Gytha's Message"; G. A. Henty, "Wulf the Saxon." (The last three deal with the Norman Conquest.)

"Phra the Phœnician," by E. Lester Arnold, relates the adventures of a person endowed with a kind of intermittent immortality; there are episodes illustrative of the pre-Roman and the Roman periods and of the times of King Alfred.

NOTE.—Since the previous list was compiled there has been published an American romance—which has been exceptionally well reviewed—dealing with the First Crusade—by W. S. Davis, "God Will's It."

* Books marked by an asterisk have been noticed in THE SCHOOL WORLD.

"Subjects for London Matriculation Examination."

WITH reference to the letter appearing in your January number under this title, the writer takes exception to that portion of the memorial presented by the A.M.A. dealing with section (a) of the compulsory subjects. Referring to the changes advocated by the A.M.A., he says, "They amount to substituting geography for historical English language and English literature"; and afterwards speaks of the "suggestion" as being "unfortunate." Permit me to point out that the Committee used the words, "mother tongue, English history, and geography," in place of the one word "English" of the Regulations.

Surely the "suggestion" is that of the writer rather than that of the A.M.A. The expression "mother tongue" was purposely used to avoid the ambiguity of the term "English," which is made to do duty in the Regulations not only for English language but also for English history and the geography relating thereto. The memorial simply dealt with the general scheme of the examination, and the hope was expressed therein that the association would be given an opportunity of placing its views as to the scope of each subject before the Senate in due course.

CHAS. E. BROWN.

Christ's Hospital,
February 13th.

The School World.

A Monthly Magazine of Educational Work and Progress.

EDITORIAL AND PUBLISHING OFFICES,

ST. MARTIN'S STREET, LONDON, W.C.

Contributions and General Correspondence should be sent to the Editors.

Business Letters and Advertisements should be addressed to the Publishers.

THE SCHOOL WORLD is published a few days before the beginning of each month. The price of a single copy is sixpence. Annual subscription, including postage, eight shillings.

The Editors will be glad to consider suitable articles, which, if not accepted, will be returned when the postage is prepaid.

All contributions must be accompanied by the name and address of the author, though not necessarily for publication.

The School World

A Monthly Magazine of Educational Work and Progress.

No. 40.

APRIL, 1902.

SIXPENCE.

HOME LESSONS FOR BOYS.

By the Rev. C. W. BOURNE, M.A.
Headmaster, King's College School.

THIS subject is of such importance that I gladly avail myself of the Editors' invitation to join in a discussion upon it, especially because there is a considerable amount of vagueness in the opinions held about it, both by parents and by teachers. If, however, the discussion is to be of benefit, we must be sure that we are all starting from the same fundamental principles; consequently I shall begin by a few general platitudes, because nothing is so frequently forgotten as that which is obvious and matter-of-course.

The object of education is twofold, to convey a certain amount of information, and to create a capacity for acquiring more. For instance, a boy on leaving school should have mastered a certain amount of geometry, so that it is part of his "mental equipment"; he should also have gained the power of studying geometry for himself, so that if necessary he can learn more geometry by himself.

Consequently, education must develop two different sides of a boy's mind—the receptive and the inquisitive. The extent to which these can be developed changes with every year of a boy's growth. A young child has a powerful memory and weak reasoning faculties: as one's reasoning capacity increases so one's memory (in most cases) diminishes in power. A well-drawn scheme of education recognises and allows for this changing capacity.

Another fact that must be borne carefully in mind is that, though one may well understand a fact the first time it is presented to one, one does not generally assimilate it, so that one can retain it, without a certain amount of repetition of it, a certain amount of "rubbing it in," as it is often called.

These preliminary remarks will, I think, suffice to clear the ground. I should like further to add that I hope in the discussion nothing will be said to imply that what schoolmasters do in this (or other matters) is done with any base motive. My experience, after some thirty-three years of

public life, is that the vast majority of persons, whatever their occupation, do honestly try to do their best, and that the number of those who are actuated by unworthy motives in their work is very small.

Possibly, one further remark may be wise—that headmasters are not in any position of hostility to parents; both parent and master are desirous that the best should be done for the boy, and they ought to work together for this end. Unfortunately, some fifty years ago circumstances combined to make headmasters much more autocratic than they are now, and a tradition has survived from that time to the effect that masters dislike hints or advice from parents. Nothing can be further from the truth than this now; a master who is up to his work enlists the aid of the parent as much as possible.

As headmasters are after all only human, it does sometimes happen that one of them exhibits some impatience when he receives a certain amount of patronising advice from an amateur; the ordinary master, if he is up to his work, is (more or less) an expert, and does not need to be told the elements of his business. For instance, a very well-meaning person wrote to me the other day to suggest that schoolmasters ought to try to interest their pupils in what they have to learn; I think if he had known anything of the working of a decent school he would have learnt that this is a fundamental principle which governs the teaching of all masters, except here and there some inefficient one who has by luck escaped extinction.

In these preliminary remarks I have been obliged to raise a certain number of side issues, but I hope the discussion will not drift off into these (though some of them are very interesting), but will stick to the subject of home-lessons.

Now, an important question directly involved is the amount of time per day that a boy ought to give to his lessons, in school and at home. On this point some valuable advice is given in Dr. Clement Dukes's "Health at School." It must, however, be borne in mind that Dr. Dukes necessarily gives a "counsel of perfection," and that, as a matter of fact, with the average boy, the times he gives can be somewhat exceeded without doing harm to the boy. A schoolmaster is perforce obliged to study closely the character and physique of his boys, and he gets to do this so

much as a matter of course that he finds out directly when a boy is below the mark, and then sets to work to find out *why* this is so. The result of this close watching of a boy's health is that a schoolmaster can see what a boy is capable of, and he is therefore in this respect even a better judge than a doctor, who only sees a boy for a few minutes occasionally. Personally my belief, after thirty-three years' work, is that it is reasonable to increase Dr. Duker's times by one-sixth.

One great safeguard is that a master should learn the symptoms of over-work, and a master who is well trained can soon do this. Directly a master observes the slightest symptom of over-work, he should reduce the amount of work, and should warn the parent; but it ought to be the rarest thing in the world for a master to find a case of this; the premonitory symptoms are so easy to recognise that it ought not to happen that a boy should ever run the risk of over-work.

One easy hint may be given to parents on this point; if ever a boy goes to bed fagged and worried by his work, it is certain that harm is being done. However hard a boy has been working, if he goes to bed in good spirits and "chirpy" he is not suffering from brain fag; that is, he is not being hurt by his hard work. But if, after his brain work is over for the day he is listless and apathetic, a parent ought to take alarm at once. Of course, there are some few boys who have acquired lazy and indolent habits, but a parent is not likely to suspect them of any over-work, and in the case of almost all boys the hint I have given is sufficient to enable a parent to keep his boy in a fit state.

Now with young boys the amount of time that they should spend on their lessons, even at my estimate, is such that all the work *could* be comprised in the school hours, and many will therefore naturally ask why this is not done, so that a boy's evenings may be entirely free. The reply is simply because the evening is not the best time for a boy to have free.

No boy will keep in good health unless he gets *daily*, and during the *daytime*, some hard exercise; practically a boy ought to get to "perspiration point" very nearly every day; this he cannot do if his work is packed into the daylight hours; so that to secure a boy proper time for healthful exercise postulates of necessity that some of his work is to be done in the evening.

Schoolmasters would vastly prefer that there should not be this evening work; it causes far more trouble to them because of the precautions that have to be taken to ensure that suitable work is set, and because of the subsequent looking over of such work. But it seems a necessity, if a boy is to have as much work during the day as will do full justice to his mental capacity.

If, then, home-lessons are a necessity (a necessary *evil*, many would say), how are we to secure that the time shall be most suitably employed? In other words, what work can a boy most profitably do when the master is not at hand to help him?

Imprimis, he can perform the "rubbing it in" process. Suppose a boy has learnt how to do division of decimals, and has mastered the idea of the method, but is still slow and diffident in the work; here is just the thing to give him as home-work. Please observe that I suppose him to have mastered the idea; if he has not, but is still in a fog about it, it would be monstrous to give him this as home-work; he would only be breaking his heart over it if he was a conscientious boy, or would get to loathe the particular rule. This is where the skill of the master comes in; he has to decide clearly whether the boy has got to the stage at which he can profitably tackle the work as home-work.

Besides this, home-work is an opportunity for giving the boy practice in his inquisitive faculty. Say that he has been doing riders in geometry in class, and (as before) has caught the idea of a certain class of riders: he may then be given one of a *similar* nature to do at home; his pride in accomplishing it by himself will go far to create in him a liking for riders. Here again the skill of the master comes in; if the boy be set too difficult a rider, instead of a liking, a disgust will be created.

Lastly, home-work is just the opportunity for practising a boy's memory. If a boy has been taught how to learn by heart (for this can be taught, though many are not aware that it can be), and if his faculty of learning by heart has been well cultivated when he is young, and he therefore finds it easy, the boy will enjoy having some "Rep." to do at night; and many of us know from our own school-days what a store of pleasure and profit one is laying in by learning by heart.

Having said briefly what is suitable for home-work, let me go on to say what is unsuitable. Well, then, it is monstrous to give boys for this purpose any new work—that is, any work in which new principles are involved; the explaining of new principles is a most important part of a master's work, and it is gross carelessness on the part of a master to set for home-work any work involving new and unexplained principles. Again, fatiguing work ought not to be set; an example in algebra which a boy knew well how to do, but which was wearisomely long and uninteresting, would be likely to disgust a boy, and so do harm.

A bad teacher can do infinite harm by giving a boy a distaste for a subject; bad teaching—that is to say, bad methods—may be readily rectified in most cases by a good teacher, but disgust for a subject can seldom be eradicated. I once had a boy who really had quite an average capacity for mathematics, but he had been in the hands of an impatient master, who had told the boy that "he was an utter fool in mathematics," and the boy was so impressed with that belief that it was practically impossible to do any good with him in the subject. As to the amount of time to be devoted to home-work, it should be *nil* for a boy of seven, and very little for a boy of eight. An average boy of nine can fairly manage an hour's work, and the time can be gradually increased until it

reaches about three hours per evening for a boy of seventeen or eighteen.

Of course, if a boy comes from a home where the parents have leisure and intellectual tastes, the desirable thing would be that the boy's evenings should be left free, so that his parents might create and foster a love of science, of art, or of literature; but unfortunately those parents who have the desire to do this seldom have the time. And it must be borne in mind that it is not possible for a school to make independent arrangements for individual boys, except to a very limited extent; the essence of a school is that the teaching is class-teaching, that is, that the boys keep together; individual arrangements which break up the class-teaching necessarily increase the cost of the school to a degree which would make the fees a grievous burden to parents. Old Winchester men have told me that in their days one charm of the school was the amount of spare time which they had for private, unsupervised study; and I think this brought out the best qualities of the best men as nothing else would; but it is admitted that for all but the best men the system meant very grievous waste. Out of twenty boys taken at random one would probably find one boy who would work his best without any stimulus or encouragement, and one who would do nothing without the most severe stimulus; the other eighteen would be boys who, with a certain amount of stimulus and encouragement, would work well, but would do practically nothing if left to themselves. The old Winchester system would have made of the best boy probably more than our present system does, but it would have wasted the eighteen.

In conclusion, let me protest against one form of home-work—the setting of holiday tasks; anything more futile and more disastrous it is difficult to imagine.

HOME LESSONS FOR GIRLS.

By Mrs. WOODHOUSE.

Headmistress of the Clapham High School for Girls.

Apply your study to such hours as your discreet master doth assign you earnestly, and the time I know he will so limit as shall be both sufficient for your learning and safe for your health.

SO wrote Sir Henry Sidney to his son Philip, and the words suggest the lines on which we will treat our subject, though we should venture to invert their order, and to put health before learning in our "limitation" of time—in other words in our framing of time-tables for our pupils. It is indeed in the co-ordination and correlation of the physical and intellectual life that the skill and "discretion" of the teacher are tested.

The question of home-work now more immediately before us can hardly be dealt with as

an isolated one. Home-work, or to speak more accurately, independent work, is and must be an integral part of the school course, and as such, must be dealt with in relation to school life and the school time-table as a whole. We are aware that it has been suggested, as a drastic remedy for the ever-present fear of overpressure, that home-work, *i.e.*, independent work, should be done away with altogether. Those who advocate this course overlook the fact that, by adopting it, we should appreciably diminish, if not altogether destroy, opportunities of individual effort on the part of the pupil, and that without such effort progress is well-nigh impossible. This is obvious in the case of music and drawing. In both, the most competent teaching would be insufficient without practice and exercise on the part of the pupil. It is not less true that in mathematics and science, the work done in class, under the eye and with the aid of the teacher, must find its complement in work done out of class, in which individual effort may be exerted. Otherwise there is danger lest the mental attitude of the pupil should tend more and more to one of passive receptivity.

Granted, then, that independent work must have its place in the time-table, it is more than ever necessary that physical exercise and recreation should find place there also; in a word, that a time-table should set forth the complete day of the child, and not merely the part of it spent at school, or in preparation of work set in school. Such a time-table must take into consideration the needs of physical as well as mental development, and to plan it rightly and wisely two things are essential:—

(1) Knowledge of the physical condition as well as the mental calibre of the child.

(2) Co-operation between home and school authorities.

First, a knowledge of the physical condition of the pupil. A suitable time-table can only be framed when the physical as well as the intellectual powers of the pupil are known. This knowledge must be based on the results of a medical inspection, such as is now becoming customary in many public secondary schools for girls. I may here be permitted to quote from my article on this subject, already published in "Educational Reports," vol. ii., p. 133:—

Entrance Examinations, according to time-honoured custom, are imposed on all new pupils, and their course of intellectual work is based on the standard of attainments thus revealed. But the accuracy of our estimates as to potentialities can only be truly ascertained when the condition of the physical powers has also been made clear to us by an expert. The necessity for a physical examination is thus made evident. Without it we cannot, in individual cases, measure the relative importance of treatment for physical and intellectual well-being.

Into the details of this examination, lack of space forbids us to enter. May it suffice to say that it should be thorough and comprehensive, conducted in the presence of the mother or guardian, and that full notes should be made and registered for future reference. The value of a test

that ascertains the conditions of eyesight, hearing, lungs, heart, spine and muscles, cannot be over-estimated. Defects should be made known to the home and school authorities in order that the work may be regulated accordingly. The inspection may reveal important facts as to previous illnesses, temperament, interest in intellectual subjects or the reverse, and thus help us in one of our greatest difficulties, the consideration of the *individuality* of the pupil. Too much stress can hardly be laid on this consideration, as undoubtedly one of the greatest difficulties in dealing with pupils in classes is the fixing of an average standard of attainment. Schemes of work may be planned in theory for children of different ages, in practice it will be found how greatly children of the same age vary in mental capacity, bodily strength and life circumstances.

Hence the immense help in the apportioning of intellectual work of an intimate knowledge of the physical health of our pupils. How important it is that we should know that our daily demands are well within the powers of, say, a rapidly growing child (whose health may be a cause for anxiety), and on the other hand how equally important it is that with a certificate of normal health to guide us mental indolence should not be condoned.

Second. Co-operation between home and school authorities.—This should not be difficult to secure, since the aim of both is the same—the welfare of the child. Both should be fully aware of all claims on the child's time. We will suppose that the parents are furnished with a time-table showing the hours of the child's lessons at school, and the time that should be employed in preparation, and I submit that the time-table, to be complete, should show the hours allotted at home to physical exercise, work and play—that inalienable right of every child. If lessons are given at home, *e.g.*, music, dancing, &c., these should be noted on the time-table, so that all claims on the child's time and strength may be realised by home and school authorities alike. It would be impossible to dwell too strongly on the great desirability of limiting these outside claims. The dovetailing of home and school engagements often involves much waste of time and unnecessary wear and tear of temper and strength.

A school time-table can, and should, include all that is necessary for the complete education of the child. The days are past when it was thought needful to resort to special "academies" for music, drawing and dancing. Experts in all these subjects are now connected with the staff of every public school. The gain in actual time is great, to say nothing of that in peace of mind to the child who finds all her work carefully planned in one place, instead of having the attendant anxiety of keeping engagements in different places. May not a plea be here introduced for the limitation, also, of social claims to the whole holiday of the week? In some cases the pressure of such claims results in hurry, over-anxiety and undue excitement, all harmful to the young mind and immature body. Is it too much to ask that a fair amount of re-

creation being secured in a daily time-table, special pleasures, involving, perhaps, unusual fatigue, should be reserved for holiday times when the ordinary routine is necessarily interrupted, and that during term-time the Saturday whole holiday may be found sufficient for home claims, attendance at concerts, visits to galleries, and other places of interest.

The co-operation of parents is also necessary where preparation or independent work has to be done at home. In the case of young children, this preparation, or the greater part of it, may frequently be done at school, but in the case of the elder girls whose afternoon has been given to games and outdoor exercise it must be done after school hours and at home. For this a well-ventilated room, freedom from interruptions, and in some few cases sufficient supervision to prevent waste of time, must be provided. Unfavourable conditions of work are an unnecessary tax on health and strength, and should be avoided.

All facts as to the physical and mental conditions and environment being now fully before us, we are in a position to consider whether or not three languages should be attempted, one, or two, branches of mathematics, a full gymnastic course, and how far art and music can be embraced in the course. Here can also be considered whether the study and practice of two instruments are possible or desirable. To refer to our former postulate, only when these points have been duly ascertained and weighed can a time-table be rightly planned. No time-table framed at large can possibly fit the circumstances of each individual child in the form.

But we will suppose that a normal case has to be planned for, and we will also assume, though the assumption is a bold one, that the previous education has not been neglected, and that the principle of continuity (insisted upon in that most interesting book, "Educational Foundations," by Mr. Ware) has been kept in view. Let it also be granted that the physical fitness has merely to be maintained by daily drill, gymnastics, a due proportion of suitable outdoor exercise, and a sufficiency of wholesome food. Then with some certainty we can form our plans—plans based on the generally accepted morning hours in public secondary schools for girls. These are: three hours for the very youngest, three-and-a-half up to the age of ten, and four hours above that age. These hours, it must be remembered, have intervals for recreation and drill for all, and in the middle and lower schools include such subjects as singing, drawing, and needlework, affording variety and relief.

Independent or home-work can be done either from 3 to 4.30 at school (after a break of two hours for the younger children), or from 4.30 to 6 at home, after an afternoon of play and outdoor exercise, and, in the case of elder girls, concluded at a later, but strictly limited time. The amount of time devoted to independent work should graduate between the years of eight to nineteen from one hour daily to three. But it must be remembered that, after the age of sixteen, when

a general education has been secured, a girl's time-table is individually planned, and, by the discontinuance of one subject (*e.g.*, science in the case of a girl specialising in classics), three or more hours per week can be gained, and the morning hour thus set free can be utilised for so-called home work, which we prefer to call independent work.

With regard to that most difficult question of music, which most girls learn in addition to their other subjects, few, I think, will consider that the necessary time for the study and practice of two instruments can be given. With the high standard of performance which now happily prevails, I think we may dismiss the case of the girl who learns two instruments as quite unusual. In the earliest stages of learning music, I recommend a piano class, where the practising is done only in the presence of the teacher, and included in morning hours. After some time, varying individually from one to three terms, independent practice should rise in a graduated scale from fifteen minutes to thirty, forty-five, and finally one hour during the school course of the average pupil. In most cases, with good teaching, this will be found sufficient to build upon later, if music is to be carried further for professional purposes. In cases of exceptional talent, and of those who mean to devote themselves ultimately to music, a special time-table can be arranged as in the case of those specialising in classics, allowing more time for the special subject.

In connection with this question, the medical inspection is again proved necessary, that the length of time which may be devoted at one time to practice may be specified. Incalculable harm has often been done by a lack of knowledge in this matter, the whole practice being done at one time instead of being divided into two or more parts according to the strength of the pupil. In the schools with which I have the honour to be associated, we are free from the incubus of public examinations up to the age of 16, and I boldly assert that if children enter at the right age, and that there is time for gradual intellectual growth, the fear of overpressure is reduced to a minimum. But it must be acknowledged that few of the pupils presented for admission can and do satisfactorily pass the two-fold test sketched above. More frequently defective and ill-judged methods of teaching have hindered or warped the mental growth, and the physical health may be below the normal standard, leaving much to be corrected and strengthened before we can expect progress, and parent, teacher, and pupil must acquiesce in a lower position for a time and the postponement of promotion until proper standards have been attained.

It is not now difficult in most public schools to make ample and satisfactory provision for physical as well as intellectual culture. Well-fitted gymnasias can be found in most, and there are usually facilities, not only for recognised games, such as hockey, tennis, cricket, spiropole, and basket-ball, but in some, as in our own case, for gardening

under skilled supervision, bee-keeping, &c. A sign of the growth of general interest in this subject is to be found in the Nature-study Exhibition which is to be held in London in the course of the summer, and which, it is to be hoped, may afford evidence of the work already done in our schools and stimulate further effort in this direction.

We fear it is sometimes said that home duties and interests may clash with those of school. If this were true it would be not only a sad confession, but also a fault for which home and school must divide the blame, and must share the responsibility of finding a remedy. Many of us feel that the hearty co-operation of the two authorities is the absolute essential of any success to be hoped for.

Pestalozzi may have been a poor teacher, but he was an unrivalled educator, and the conviction that he must enlist the co-operation of mothers was at the root of the humanity, devotion and self-sacrifice that marked his educational methods. To Froebel, the life of the home, together with the school life, formed the basis and medium of all development, and, in his view, no thorough training was possible unless the germs of right feeling and thought were from the earliest years implanted by the mother in the child's life, and in after years were fostered and matured co-ordinately in the family and in the school.

THE GROWTH OF EDUCATIONAL IDEALS DURING THE 19TH CENTURY.

I.—THE EDUCATION OF GIRLS AND WOMEN.

By SARA A. BURSTALL, B.A.

Headmistress of Manchester High School.

THAT the movement for the better and higher education of girls and women is, roughly speaking, fifty years old, may be known to many; but why it began about 1850 is a question to which no complete answer has yet been given. No great mind has yet grappled with the history, the philosophy, the details of research necessary for such a labour: nor has any writer on this subject been gifted with insight keen and true enough to explain for us so remarkable a phase of human progress. There are obviously some general explanations in the action of forces affecting social life: the vast and far-reaching waves of thought and action set up by that great explosion, the French Revolution; religious movements such as those of Wesley, Simeon, Newman, Maurice; political reforms, themselves effect and cause of deeper reformation; the scientific new birth bringing with it scientific conceptions and modes of thinking, liberating reason from the superstitions and prejudices of the past—all these had their influence. The Reform Bill of 1832, which gave the middle classes political power, the Oxford Movement in the 'forties, and the sweet influences of a noble Queen and a purer court were factors acting

in the same direction, but, like all such forces, their effect did not appear immediately. Indeed, although the first colleges and secondary schools for women were founded in the middle of the last century, it was not until 1875 that definite public success was achieved. The pioneers, like Miss Emily Davies and Miss Clough, Miss Buss and Miss Beale, had been working for more than twenty years before the mass of even enlightened public opinion had been influenced sufficiently to produce on any large scale effective changes.

We may clear the ground somewhat by noticing a few dates which are landmarks in the story of this educational development. Queen's College, Harley Street, was founded in 1848 under the influence of F. D. Maurice, Dean Plumptre, R. C. Trench, and others, in connection with the Governess's Benevolent Institution, to provide a better preparation for women teachers; Bedford College followed in 1849. The first girls' high school, type and model to some degree of all the others, the North London Collegiate School, was founded by Frances Mary Buss in 1850. The Ladies' College, Cheltenham, which aimed at providing for



Frances Mary Buss.¹

girls similar educational advantages to those their brothers enjoyed at the boys' college in the same town, was opened as a day school in 1853, though Miss Beale, who is still its head, was not appointed till 1858. In the 'sixties Royal Commissions on Education set to work, and in 1865 ladies were summoned to give evidence as to girls' schools. In 1863 the Cambridge Local Examinations were opened, as an experiment, to girls; in 1867 the "North of England Council for promoting the Higher Education of Women" was constituted under the influence of Miss Clough; and in 1869 London University organised a special women's examination. Meantime the women's colleges at Cambridge were beginning under Miss Emily Davies and Miss Clough, and with the 'seventies their development became rapid. In 1873 the new buildings at Girton were occupied, in 1875 those of Newnham, while already their students had for

some years been allowed to take the Tripos papers. The high-school movement made a great advance in 1872, when Mrs. William Grey founded a National Union, under the presidency of the Princess Louise, to work for the reform of girls' education; this association established the Girls' Public Day Schools Company, and the foundation of their oldest schools, Chelsea, Notting Hill, and Croydon, quickly followed. Manchester, which likes to do things for itself, had already formed an association of public-spirited men and women to do locally the same work, and under their auspices the Manchester High School was opened in January, 1874. The crowning achievement of this eventful decade was the opening of degrees to women by the University of London in 1878.

Such is, in briefest outline, the history of the educational movement in that third quarter of the nineteenth century which saw the extension of the franchise to the masses of the people, the abolition of university tests, the Elementary Education Act, Darwin's "Origin of Species," Mill's "Subjection of Women," the writings of Charlotte Brontë, Elizabeth Barrett Browning, Mrs. Gaskell and George Eliot, the passing away of the generation to which belonged Wellington and Palmerston, and the spread of the influence of thinkers and teachers such as Matthew Arnold, Ruskin, Tennyson, and Maurice.

Events like these have a relation to the movement we are endeavouring to study; they are either effects or causes, or even sometimes both effect and cause, of social and educational change; they were forces tending to progress, emancipation, spiritual growth, or they were the product of such forces, and they acted on public opinion, and helped to make the successes that were to follow, in the struggle so long waged by the pioneers of girls' education. We may now try to formulate or to ascertain the ideas, the moving principles held by these pioneers, in so far as that is possible within the limits of a short magazine article. Such a task has its obvious difficulties; the women who were in the thick of the battle had little time or opportunity to express themselves, nor indeed were they orators, philosophers, or writers. Those of us who have lived through the story are necessarily partial and limited in our own view of it: we can but tell of the area and the leaders we best knew, and our feelings are too deep to allow us, it may be, to judge wisely even of these. Some few books¹ exist as original authorities, and it is possible at this distance of time to make some general statements

¹ "Thoughts on Self-Culture." By Maria Grey and Emily Shirreff. (London, 1850.)

"Intellectual Education." By Emily Shirreff. (London, 1862.) "The Higher Education of Women." By Emily Shirreff. (London, 188a.)

"The Higher Education of Women." By Emily Davies. (London, 1866.)

"On the Education of Girls." By Dorothea Beale. (London, 1866.)

"Frances Mary Buss, and her Work for Education." By Annie E. Ridley. (London, 1895.)

"A Memoir of Anne Jemima Clough." By B. A. Clough. (London, 1897.)

"Education of Girls and Women in Great Britain." By C. S. Bremer. (London, 1897.)

"The Renaissance of Girls' Education." By Alice Zimmern. (London, 1898.)

"Work and Play in Girls' Schools." By Dorothea Beale and others. (London, 1898.)

¹ The Editors are indebted to Mrs. Bryant for permission to use, from the "Frances Mary Buss' Schools Jubilee Record," the illustrations in this article.

which form themselves in the mind as one reads, remembers, and studies all that is left. First and all important is the salient fact that these women were not revolutionaries and extremists; they were practical Englishwomen, seeking a way out of practical difficulties, a remedy for definite evils in the world around them, among the women and girls they knew. Their ideals and aspirations, their beliefs and convictions, were those of other high-minded, true-hearted Christian gentlewomen of their day. They hated publicity, frivolity, social innovation; they were remarkable for a grace and dignity, an old-world refinement and charm, we miss in some of the modern leaders. Home, affection, simplicity, duty, were beloved realities to them. It was, indeed, their lofty moral ideal, as well as their practical common sense, which urged them to fight so well for an education which would give other women intellectual thought, practical success, pure tastes, and noble aims. The proof of this lies patent on every page of such records as exist, and comes vividly to the memory of those who, like the present writer, were privileged to know and to be influenced by such women.

There seem to have been three main principles held by all, though in different degrees, and the greater or less proportion of each has produced different effects and different lines of tradition. Foremost comes the economic problem, the question of fitting girls to earn a living; this led to the principle of securing for girls the same advantages of education as their brothers had, and is answerable in part for the intensity of the struggle to assimilate girls' education to that of boys, to gain admission to examinations and degrees on equal terms, to maintain in the schools a standard of thoroughness, discipline, and health which would fit women for the struggle for life. This principle was firmly held by Miss Buss and those who worked with her. "Why are women so little thought of? I would have girls trained to match their brothers"—a saying of her girlhood—was, as Miss Ridley says, "the keynote of her harmonious life. It was experience transmuted into sympathy."

Second, was the belief in intellectual education for its own sake, as an inherent human right. Mrs. William Grey, Miss Shirreff, and Miss Beale express this strongly. The latter, in a pamphlet published in 1866, says, alluding to the Divine Order of the world, "it was intended that the mental and moral capacities of women should be cultivated and improved"; and, in a more recent work, "the task of the educator is in the first instance to develop to the highest perfection all the powers of the child." Miss Shirreff, in "Intellectual Education," writes: "The task of education is twofold. First to cultivate moral and intellectual habits; secondly, to inspire love of knowledge." Mental activity was to be a remedy for the many evils in a woman's lot, which in the 'sixties was narrow and limited enough among the upper middle class. Thus mathematics, grammar, and logic were studies recommended by her, as

well as literature, history and geology. Miss Emily Davies protests in her "The Higher Education of Women" against the theory that a liberal



Emily Davies.

education was only necessary for men, and that women were an entirely different species of being. She points out that the Christian theory of education makes no distinction of sex, and that as things were then, the time of young women in the comfortable classes was spent on *dilettante* occupations, worthless to themselves and others. "The accurate habits of thought and the intellectual polish by which the scholar is distinguished ought to be no less carefully sought in the training of women than in that of men" (p. 73).

Third, was the principle of fitting women for the proper performance of their special work as centres of influence in the home, as the companions and helpmates of men, as guardians and educators of childhood, and as philanthropic workers. For this reason Miss Shirreff advises the compulsory study of physiology, philosophy, kindergarten methods, and social economy. Miss Emily Davies shows how the better intellectual training of women would make them better fitted to discharge their duties in the home and in society. Miss Beale, writing in 1898, points out that this hope has indeed been fulfilled:

Women, too, are more conscious of their responsibilities in the life of the family, as well as in that of the country, especially in social and church life. We see every year at the conference of women workers that the seed sown in faith has brought forth fruit; that the whole aspect of the woman's realm has changed since the days of Evelina and Miss Austen.

Thus the High Schools when founded under the influence of such women as these were a protest against superficiality and showiness; accuracy and thoroughness were their aim everywhere. An early prospectus of the Girls' Public Day Schools Company illustrates this by its opening paragraph: "The aim of the company is by the employment of an ample staff of competent teachers and the use of the best methods of instruction to ensure for girls an education adapted to their requirements, but as sound and thorough as that which boys now

receive in grammar schools of the highest class." The women's colleges were intended to give that scholarly training and that wider outlook on intellectual life which would help to remove the evils of frivolity, narrowness, and inactivity in women's lives, and also to provide academic preparation for teachers. These two ideals come out prominently in the story of Miss Clough's work, where the first steps taken by the North of England Council, of which she was secretary, was the provision of lectures by men of university standing, affording to older women opportunities for advanced study. Profs. James Stuart, Hales, Seeley, and Sir Henry Roscoe are a few among those giving these lectures—a movement destined to lead to University extension. The next step was the foundation



Anne Jemima Clough.

of special examinations for women by the University of Cambridge (the Higher Local), and, consequent on it, an attempt to secure preparation in Cambridge for this by academic teachers. Thus the germ of Newnham came into being, when Miss Clough went to Cambridge in 1870 to take charge of a house where women seeking this instruction could live. Her desire for friendly and affectionate relations between teachers, for that sort of common life among themselves which men had long had, but which in 1870 was practically unknown to women, helped to make this beginning a real advance socially as well as intellectually.

We may also note in this connection the striking fact that the whole movement was aided throughout by the chivalrous and devoted help of men. Maurice was one of the founders of Queen's College; Lord Lyttelton, Mr. James Bryce, and Mr. (now Sir Joshua) Fitch did much to rouse public opinion through the Royal Commission in the 'sixties. Their verdict is worth quoting:—

It cannot be denied that our picture of middle-class education is, on the whole, unfavourable. The general deficiency in girls' education is stated with the utmost confidence and with entire agreement, with whatever difference of statement, by many witnesses of competent authority. Want of thoroughness and foundation; slovenliness and showy superficiality; inattention to rudiments; undue time given to accomplishments, and these not taught intelligently or in any scientific manner; want of organisation; these may sufficiently indicate the character of the complaints received.

Mr. Bryce's recommendations are of special interest too, as reform has proceeded along the lines he traced. He advised:—

(1) The establishment of schools for girls under proper authority and supervision: "It would be most desirable to provide in every town large enough a day school for girls under public management."

(2) Considerable changes in the course of instruction: "It would be proper to lay more stress on arithmetic, introduce mathematics everywhere, and Latin where it was possible to give time enough."

(3) The provision of institutions where women could receive the higher education given by the Universities to men.

Such were the recommendations; in our next article we shall endeavour to carry on this necessarily hurried and inadequate sketch of the work that made these suggestions realities. Those who seek a more complete and thorough investigation may refer to the above-mentioned books, most of which are accessible in the Library of the Teachers' Guild.

THE HEURISTIC METHOD OF TEACHING CHEMISTRY.

ITS APPLICATION TO MORE ADVANCED PROBLEMS.

By F. CRANMER BENTLEY.

Science Master at St. Dunstan's College, Catford.

IN the December, 1900, number of THE SCHOOL WORLD Mr. C. M. Stuart described very briefly a course of work on salt and hydrochloric acid which concluded with the discovery of chlorine, bromine and iodine. These experiments are generally taken after the research on chalk and other carbonates is completed. The composition of hydrogen chloride and silver chloride is then ascertained, and after the definition of "equivalent" has been deduced, the equivalents of sodium, potassium, chlorine and bromine (by means of deci-normal silver nitrate solution, with either potassium chromate or potassium sulphocyanide) are determined. The atomic theory and the use of symbols is *not* introduced. Sometimes it is advisable to insert, as an alternative to this latter work, a series of quantitative experiments on acids and alkalis, and for this purpose the actual weight of dissolved hydrogen chloride is found by passing

the gas into water, the weight before and after being taken. The alkali used is caustic soda, which is obtained directly from a known weight of sodium. The method of entering results into the note-book is given later.

SULPHUR AND ITS COMPOUNDS.

Our next research includes an investigation of sulphur and its compounds, and in this course theoretical considerations, including the atomic theory, are entered into at some length.

As in the case of chalk, sulphur itself is examined. It is tested with solvents other than water, its solubility in ether, chloroform and carbon bi-sulphide being thus discovered. Its melting point is determined, using a capillary tube attached to a thermometer, which is heated in glycerine.

Sulphur is then warmed, and the changes which it undergoes at various temperatures are noted. The three principal modifications in which it exists are discussed, and some teachers may doubtless find it possible to introduce the subject of "allotropy" at this point.

We find that when sulphur burns in air it produces a strong-smelling gas, which, from our former work, we have reason to believe must be an oxide of sulphur. We therefore burn some sulphur in a cylinder of oxygen and find that, since the same gas is produced, our surmise is correct. The sulphur oxide thus obtained is found to have a characteristic smell, to be soluble in water, and to possess acid properties. We point out that an oxide of another non-metal, namely, carbon, is also soluble in water and possesses slightly acid properties, and we therefore ascertain how oxide of sulphur behaves with lime water. We find that no precipitate is produced, but on evaporating the liquid a white substance corresponding to chalk is formed, since on treatment with dilute acid it liberates oxide of sulphur just as chalk liberates the oxide of carbon under similar conditions. We also investigate the action of oxide of sulphur on other alkalis such as potash and soda, discovering that the alkali is neutralised and a soluble salt effervescing with acid is produced.

Our next problem is to determine the composition of this sulphur oxide. The method involves burning some sulphur and absorbing the resulting gas by soda-lime. A hard glass-tube is drawn out at one end, which is packed with a loose plug of asbestos fibre. The sulphur is put into a boat which is inserted in the tube. The tube is then closed by a cork carrying a smaller tube which is connected to a guard tube of potash, this latter absorbing carbon dioxide from the air. The drawn-out end of the weighed combustion tube is attached to two soda-lime tubes, which are weighed before and after the experiment. Air is drawn through the apparatus by means of a suction pump, and the sulphur is burned. The loss in weight of the combustion tube, and the gain in weight of the U-tubes, give us respectively the amount of sulphur used, and the quantity of oxide

of sulphur formed. The necessity of a boat is not at once apparent, but we find from experience that with it the burning of sulphur takes place more regularly than without it. The results obtained in this way are usually most satisfactory.

The composition of oxide of sulphur by volume is now determined. The apparatus is illustrated

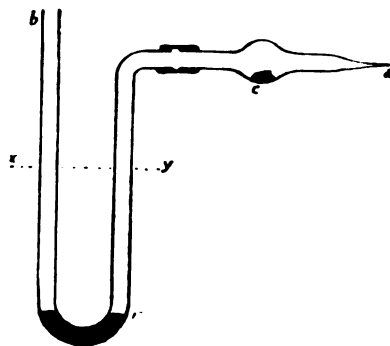


FIG. 1.—Arrangement for heating a solid in a closed volume of a gas. (From Simmons and Jones's "Elementary General Science.")

in the figure. The U-tube contains a small quantity of mercury just sufficient to fill the bend, and a very small piece of sulphur is placed in the tube, *c a*, which is then fixed to the U-tube by a piece of indiarubber. Oxygen is then passed in until it is considered that all the air is displaced. More mercury is poured into the U-tube, the drawn-out end is closed, either by a rubber stopper or by sealing in a Bunsen flame, and the level *x y* is noted. The sulphur is heated until it catches fire with a slight explosion. The tube with its contents is allowed to cool, and the mercury is found to stand at the same level as before, showing that the volume of oxide of sulphur produced is equal to the volume of oxygen used up.

Oil of vitriol is next examined. It is found to be a thick oily liquid, which, on mixing with water, produces great heat and a solution possessing powerful acid properties. It is highly corrosive, charring wood and other organic substances at ordinary temperature. When heated it does not boil as other liquids, but gives off dense white fumes. It neutralises alkalis and produces crystalline salts. Its behaviour with metals is observed. With iron and zinc the dilute acid gives off hydrogen, producing at the same time definite crystalline salts. In the light of former work on acids we are justified in concluding that oil of vitriol contains hydrogen. The strong acid, however, behaves differently, as with the following metals, iron, zinc, tin, mercury and copper, a gas is given off which is readily identified as oxide of sulphur. By these reactions we learn that oil of vitriol contains sulphur and oxygen as well as hydrogen. In the case of the solution of copper we isolate a crystalline salt, which resembles the substance formed when zinc and iron are treated with dilute acid. The behaviour of the strong acid with metals enables us to prepare oxide of sulphur in convenient quantities, and we use this method of obtaining the gas when quantities are required for

the purpose of determining its density. A very simple piece of apparatus is used for this purpose. It consists of a large bulb, having a capacity of about 100 c.cs. blown in the middle of a small glass tube. The ends of the tube are closed by rubber and glass stoppers, and the tube is weighed. It is then filled with dry oxide of sulphur and weighed again, after which, by filling with water and emptying it into a graduated cylinder, the volume is ascertained. The volume of the air in the bulb at normal temperature and pressure is calculated, and assuming that 1 c.c. of air weighs 0.0013 grm., the weight of air in the bulb is found. The following results of an actual experiment will show how the calculation is made:—

Weight of flask + air	=	35.679 grms.
Weight of flask + gas	=	35.809 grms.
Volume of air in flask	=	90.4 cu. cms.
Temperature and pressure of gas in flask	=	22°C. and 759 mm.
Volume of air at 0°C. and 760	=	83.5 cu. cms.
1 c.c. of air at 0° and 760° mm.	=	0.0013 grm.
Weight of air in flask	=	0.1086 grm.
Weight of flask + air	35.679 grms.	
Weight of air in flask	0.1086 grm.	
Weight of flask	35.5704 grms.	
Weight of flask + gas	35.809 grms.	
Weight of flask	35.5704 grms.	
{ Weight of gas	0.2386 grm.	
{ Volume of gas at 0°C. and 760 mm.	83.5 cu. cms.	
Weight of 1 cu. cm. of gas or density	0.002858 grm.	
Density compared with hydrogen	=	$\frac{0.002858}{0.0000896}$
		= 31.89.

Returning to oil of vitriol, the difference between this substance and the acid solution produced on dissolving oxide of sulphur in water is pointed out, although they both appear to contain the same elements.

With regard to the composition of the former, we know that it contains the same elements as the latter, but we are not sure that nothing else is present. However, we assume at first that, since no other element has been discovered, no other element is present. From our previous work we know that acids are generally produced by the union of an oxide with water. Is it so in this case? In fact, is there another oxide of sulphur which, on combination with water, will produce oil of vitriol? We therefore try to further oxidise the sulphur oxide, and for this purpose we employ the usual apparatus shown in the adjoining diagram (Fig. 2). It is impossible at this stage to explain fully the action of the platinised asbestos.¹

¹ This method of leading up to the composition of sulphuric acid is not altogether satisfactory. I shall be glad to hear if other teachers can suggest a somewhat more direct course of reasoning.

The oxide of sulphur together with a stream of oxygen is passed over heated platinised asbestos, and the product of the reaction is collected in a tube which is immersed in a mixture of ice and salt. Large quantities of fumes are produced and con-

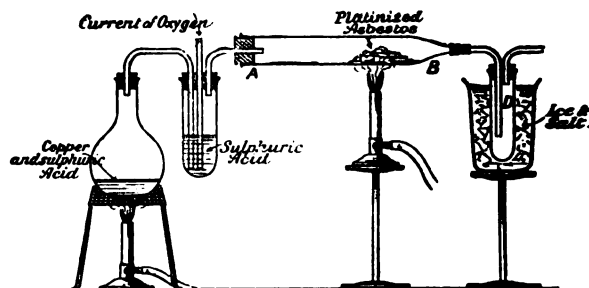


FIG. 2.—Preparation of the higher oxide of sulphur.
(From Simmons and Jones's "Elementary General Science.")

densed to white crystals in the cooled tube. These crystals, we know, are a higher oxidation product of sulphur. Will they on combination with water produce oil of vitriol? We carefully treat them with water and examine the product, which we find to be identical with oil of vitriol, and thus ascertain that this substance consists of an oxide of sulphur combined with water, the oxide of sulphur containing more oxygen than that which is formed when sulphur is burnt. We are now able to assign the name "sulphuric acid" to this compound, and the nomenclature of both the sulphuric acids and their compounds is introduced. It is also convenient at this point to make clear that the essential property of an acid is that it is a compound containing hydrogen which can be replaced by a metal, forming a salt.

The commercial preparation of sulphuric acid is next discussed without treating the theory of the reaction at all fully. The usual lecture experiment is exhibited, and the nitric oxide used is merely described as a compound which becomes oxidised by the air, and then delivers the oxygen to the sulphurous oxide. This explanation, although somewhat incomplete, is quite sufficient at this stage. At the same time some teachers will probably prefer to leave the experiment until the oxides of nitrogen are taken.

Here we usually introduce a course of experimental work on acid and alkali, which from practical experience we find takes a considerable time, but which, for many reasons, we believe to be important. Speaking generally, this seems to present great difficulties to boys. Most of these difficulties are due to a looseness of statement which they invariably adopt, and it becomes necessary in the first stages, at any rate, to insist on one particular form of statement. Much confusion also arises between words which refer to the dissolved substance and to the solution thereof. The following method of stating the results we have found convenient. The following is an actual example from a note-book:—

PROBLEM.—To determine the strength of a solution of sulphuric acid by means of a known acid and an unknown soda solution.

DATA.

Strength of known acid = 0.0049 grm. of hydric sulphate per c.c.

10 c.c. of known acid were neutralised by soda solution.

<i>Soda in burette.</i>	(1)	(2)
1st Reading	3.7 c.c.	9.2 c.c.
2nd Reading	9.2 c.c.	14.6 c.c.

Amount of soda used 5.5 c.c. 5.4 c.c.

Average amount of soda solution used, 5.45 c.c.

10 c.c. of unknown acid were then neutralised by soda solution.

<i>Soda in burette.</i>	(1)	(2)
1st Reading	14.8 c.c.	17.4 c.c.
2nd Reading	17.4 c.c.	20.2 c.c.

Amount of soda used 2.6 c.c. 2.8 c.c.

Average amount of soda solution used = 2.7 c.c.

CALCULATION.

Amount of known acid taken 10.0 c.c.

Amount of soda solution used 5.4 c.c.

Since 5.45 c.c. of soda solution neutralise 10 c.c. of acid,

5.45 c.c. of soda solution measures 10×0.0049 grms. of hydric sulphate,

1 c.c. of soda solution measures $\frac{0.049}{5.45} = 0.009$ grms. of hydric sulphate.

Amount of unknown acid taken = 10 c.c.

Amount of soda solution used = 2.7 c.c.

Since 1 c.c. of soda solution measures 0.009 grm. of hydric sulphate,

∴ 2.7 c.c. of soda solution measures 0.009×2.7 grms. of hydric sulphate = 0.0243 grm.

Again, 10 c.c. of unknown acid solution contains 0.0243 grm. hydric sulphate,

1,000 c.c. of unknown acid solution contains 2.43 grms. hydric sulphate.

RESULT.—1 litre of unknown acid solution contains 2.43 grms. hydric sulphate.

The students are now capable of appreciating the general laws of chemical action, and it is at this point that they are first introduced. Dalton's theory is explained, the law of Avogadro stated, and the use of formulæ adopted. In this latter connection, making use of the density of oxygen and sulphur dioxide, we deduce a formula for sulphur dioxide, and it is always gratifying to notice the pleasure that boys find in applying their own experimental data in support of such an abstract consideration.

We now return once more to sulphur, and endeavour to ascertain whether it will form any compounds with metals. The sulphides of copper and iron are prepared and their composition is determined. Their behaviour with dilute acids is observed, and the production of sulphuretted hydrogen is noted. The gas is prepared in large quantities, its properties are examined and its density determined. Adopting the same apparatus as in the case of sulphur dioxide, but using metallic

tin to abstract the sulphur, the composition of this gas is found. From the result of our operations we are able to assign a formula to this gas, thus once more making use of Avogadro's system of generalisation.

In concluding this course the opportunity of exhibiting the behaviour of sulphuretted hydrogen with some metallic salts is taken, and an endeavour is made to show how useful it may prove in separating these metals from others which do not react in a similar manner.

NOTES ON ARITHMETICAL CALCULATIONS.¹

By JOHN ORCHARD, M.A.(Oxon.)

III.

RESOLUTION INTO PRIME FACTORS.

FACILITY in the resolution of numbers into prime factors is essential to the apt arithmetician.

So many short processes depend on the expression of numbers as the product of primes—or, at any rate, of simple factors—that to be slow in this one process is to spoil all. The fundamental method is to exhaust the possibilities of a number as a factor-container by a process of continuous division by primes. It is generally advisable to do this by commencing with the lowest and proceeding to higher primes in ascending order of magnitude, dividing the number by each prime as often as possible before passing to the next.

Example: Find the prime factors of 194040.

2/194040
2/97020
2/48510
3/24255
3/8085
5/2695
7/539
7/77
11

Factors are $2^3 \cdot 3^2 \cdot 5 \cdot 7^2 \cdot 11$.

Two points which would tend to the shortening of this method are at once noticeable:—

(1) If, at a glance, it could have been seen that the number 194040 was divisible by 8 (= 2^3), it would have been unnecessary to have divided by 2 three times; a single division by 8 would have been sufficient. Similarly one division by 9 could have been substituted for the double division by 3.

(2) It would evidently be a great convenience to be able to tell at sight if any given prime were a factor of a number without going through the test of dividing the number by the prime.

Unfortunately it is not possible to say at a glance in every case whether a prime or power of a prime is a factor of a number. But it is possible in a few cases, and in others certain criteria exist which simplify the matter somewhat. The follow-

¹ Concluded from p. 52.

ing rules and criteria are useful in determining the divisibility of a number by the following primes and powers of primes :—

- 2 : The last digit of the number is even.
- 2² : The last two digits are divisible by 4.
- 2³ : The last three digits are divisible by 8.
- 3 : The sum of the digits is divisible by 3.
- 3² : The sum of the digits is divisible by 9.
- 5 : The last digit is 5 or 0.
- 5² : The last two digits are divisible by 25 ; *i.e.*, are 00, 25, 50 or 75.
- 5³ : The last three digits are divisible by 125 ; *i.e.*, are either 000, 125, 250, 375, 500, 625, 750 or 875.

7, 11, or 13 } Divide the digits of the number into groups of three, starting from the units end. Then if the difference between the sum of the even groups and the sum of the odd groups is divisible by 7, 11 or 13, the original number is so divisible.

Example: $1/234/324$. The critical number in this case is $324 + 1 - 234 = 91 = 7 \times 13$ so that, 1234324 is divisible by both 7 and 13, but not by 11.

11 : Another method : Find the sum of every alternate digit, beginning with the units digit, and also the sum of every alternate digit beginning with the tens digit. If the difference between these sums is 0 or a multiple of eleven, the number is divisible by eleven.

17 : Divide the digits of the number into groups of two, starting from the units end. Then if : first group - 2 (second group) + 2² (third group) - 2³ (fourth group) - [(fifth group) - 2 (sixth group) + 2² (seventh group) - 2³ (eighth group)] + &c., is divisible by 17, the number is similarly divisible.

Example: Test if 17 is a factor of 1,45,35,40,67,00,08,31. Critical number is $31 - 2 \times 8 + 0 - 8 \times 67 - \{40 - 2 \times 35 + 4 \times 45 - 8 \times 1\} = -663$ and $63 - 2 \times 6 = 51 = 17 \times 3$ \therefore 663 is a multiple of 17 and so is the original number.

19 : Divide the digits into groups of two as for 17 ; the criterion is that : (first group) + 5 (second group) + 5² (third group) + &c., should be divisible by 19.

37 : Divide the digits into groups of three as above, then the sum of these groups must be divisible by 37.

101 : Same as for 37 with groups of four.
73 } As for 7, 11 and 13, but the digits are to be
137 } divided into groups of four instead of three.

Criteria can be found for any prime, but in cases other than those mentioned they are generally more interesting than useful.

Example: (1) Factorise 2,308,600.

(a) Last three digits are divisible by 8 and by 25 \therefore 2³ and 5² are factors.

$$\begin{aligned} 2^3 \times 5^2 &= 200. \\ 200/2,308,600 & \\ &11,543 \end{aligned}$$

(b) Tests for 3² and 3 fail.

(c) $543 - 11 = 532 = 7 \times 76$ \therefore 7 is a factor, but 11 and 13 are not.

$$\begin{array}{r} 7/11,543 \\ 1,649 \end{array}$$

(d) Test for 17 :— $49 - 2 \times 16 = 17$ \therefore 17 is a factor.

$$17/1649$$

97 = a prime number

$$\therefore 2,308,600 = 2^3 \times 5^2 \times 7 \times 17 \times 97.$$

Example: (2) What primes less than 20 are factors of 3,396,432? Usual tests for 2 and 3 satisfy, but 5 is not a factor. $432 + 3 - 396 = 39 = 3 \times 13$ \therefore 13 is a factor, but 7 and 11 are not. To test for 17. $32 - 2 \times 64 + 4 \times 39 - 8 \times 3 = 188 - 152 = 36$. \therefore 17 is not a factor of the number, as it is not a factor of 36.

To test for 19. Critical number is $32 + 5 \times 64 + 5^2 \times 39 + 5^3 \times 3 = 32 + 320 + 975 + 375$ (use the shortened forms for multiplication by 5, 5² and 5³) = 1702.

Apply the process again to 1702.

$2 + 5 \times 17 = 87$, which is not a multiple of 19 \therefore 19 is not a factor of the number.

2, 3 and 13 are the only prime factors less than 20 of the given number.

Example: (3) Numbers like the following, in which the number of thousands equals the number contained in the last three digits, are always divisible by 7, 11 and 13 ; for $7 \times 11 \times 13 = 1001$.

Thus $17,017 = 17 \times (7 \times 11 \times 13)$,

$$999,999 = (7 \times 11 \times 13) \times 999 = 3^3 \times 7 \times 11 \times 13 \times 37$$

$$100,100 = 7 \times 11 \times 13 \times 100.$$

Example: (4) Similarly numbers whose last four digits are the same as those which precede are divisible by 73 and 137, for $73 \times 137 = 10,001$.

$$840084 = 84 \times 73 \times 137$$

$$2310231 = 231 \times 73 \times 137$$

$$\text{(But } 231231 = 231 \times 7 \times 11 \times 13 \text{)}$$

Example: (5) If in a number of four digits the last two are twice the first two, the number is divisible by 17. For $17 \times 6 = 102$. Thus $3978 = 39 \times 102 = 39 \times 6 \times 17$.

Note: If the critical number found by the process indicated for the primes 7, 11, 13, 17, 19, 37, 73, 101, 137, is still very large the process should be repeated (*vide* example 2 above) until a number is obtained less than 100 for the numbers 17 and 19, less than 1000 for 7, 11, 13 and 37, and less than 10,000 for 73, 101 and 137.

SQUARE AND CUBE ROOT.

Instead of using the ordinary methods of extracting square and cube roots, whenever possible resolve into prime factors by the above methods. The square and cube roots are then immediately written down by dividing the index of each prime by two or three as the case may be.

Example: Find the square root of 9922500.

$$\begin{aligned} 9922500 &= 10^2 \times 99225 = 10^2 \times 5^2 \times 3969 \\ &= 2^2 \times 5^4 \times 3^2 \times 441 = 2^2 \times 5^4 \times 3^4 \times 7^2 \end{aligned}$$

The square root is $2 \times 5^2 \times 3^2 \times 7 = 3150$.

COMPARISON OF VULGAR FRACTIONS.

There are three ways in which the magnitude of vulgar fractions may be compared.

(1) The ordinary method, *viz.*, to reduce all the fractions to a common denominator, which is the L.C.M. of the denominators of the fractions.

Example: Which is the greatest and which the least of the fractions $\frac{5}{11}$, $\frac{7}{11}$, $\frac{8}{11}$? The fractions are $\frac{5}{11}$, $\frac{7}{11}$, $\frac{8}{11}$. Therefore $\frac{8}{11}$ and $\frac{5}{11}$ are the greatest and least fractions respectively.

(2) If the denominators are convenient divisors, convert the fractions into decimal fractions to as many places as is necessary. In the last example, for instance, the three fractions are .666 . . . , .714 . . . , .727 . . . , and these decimals are easily comparable.

(3) If, on the other hand, the numerators are more convenient divisors than the denominators, convert the fractions into reciprocals of decimal fractions.

Example: Compare the fractions $\frac{3}{105}$, $\frac{3}{135}$, $\frac{7}{378}$ and $\frac{1}{571}$. They are respectively equal to $\frac{1}{35}$, $\frac{1}{45}$, $\frac{1}{54}$, $\frac{1}{571}$ The fractions in descending order of magnitude are $\frac{1}{35}$, $\frac{1}{45}$, $\frac{1}{54}$ and $\frac{1}{571}$, the fraction with the least denominator being the greatest and *vice versa*.

CONVERSION OF DECIMAL TO VULGAR FRACTIONS.

Note that in any number in the decimal system of notation the following combinations of digits may be represented by fractions of a unit which is situate in the digital place next before them in a number:—

$$\begin{aligned}
 5 &= \frac{1}{2} \text{ of } 10 \therefore .35 = 3\frac{5}{10} = \frac{35}{100} \\
 25 &= \frac{1}{4} \text{ of } 100 \therefore .525 = 5\frac{25}{100} = \frac{525}{1000} \\
 75 &= \frac{3}{4} \text{ of } 100 \therefore .2175 = \frac{2175}{10000} \\
 125 &= \frac{1}{8} \text{ of } 1000 \therefore .8125 = \frac{8125}{10000} \\
 375 &= \frac{3}{8} \text{ of } 1000 \therefore .82375 = \frac{82375}{100000} \\
 625 &= \frac{5}{8} \text{ of } 1000 \therefore .1625 = \frac{1625}{10000} \\
 875 &= \frac{7}{8} \text{ of } 1000 \therefore .0875 = \frac{875}{10000}
 \end{aligned}$$

In the same way a decimal, part of which recurs, may be easily converted to a vulgar fraction without going through the process usually employed, provided that this recurring part, when written without non-recurring figures, represents a simple fraction. Thus:—

$$\begin{aligned}
 .6 &= \frac{6}{10} \therefore .76 = 7\frac{6}{10} = \frac{76}{100} \\
 .142857 &= \frac{1}{7} \therefore .786142857 = 7\frac{861}{1000} = \frac{7861}{10000} \\
 .285714 &= \frac{2}{7} \therefore .7285714 = 7\frac{2857}{10000} = \frac{72857}{100000} \\
 .076923 &= \frac{1}{13} \therefore .06076923 = \frac{60769}{100000} = \frac{60769}{130000} \\
 .230769 &= \frac{3}{13} \therefore .013230769 = \frac{13230769}{1000000} = \frac{172}{3250}
 \end{aligned}$$

Some amount of cancelling can be saved by the use of this method whenever possible.

APPROXIMATE MULTIPLICATION.

To find the product of two numbers to a given degree of approximation, e.g., find the product of 87.894321 and 76.089762 true to two places of decimals. Take one of the numbers as the multi-

plier, say 76.089762. Evidently the last of the digits in the multiplicand which can affect the third place of decimals is the 2, for it represents $\frac{2}{100000}$, and the maximum value of any digit which multiplies it is 7×10 , giving a product of $\frac{14}{100000}$, or .0014. It is, however, more convenient to consider the 3, which represents 10,000ths, and the 7, which represents tens, as producing a product of 1,000ths, which is the denomination of the third place of decimals. The effect of the 2 can be allowed for by an addition. Proceed as follows:—

Place the digit of maximum value in the multiplier under that digit in the multiplicand, multiplication by which will affect one place beyond the last decimal place required, and write the other digits of the multiplier in reverse order as in the example below. When the multiplication by 7 has been completed, strike out the 7 and 3, and proceed to multiply the 4 by 6, carrying 1 from the product of 6 and 3. The result of multiplying thousandths by units corresponds to the multiplication of ten-thousandths by tens, so that the 4 will be in the third decimal place. Then strike out the 6 and 4, and 0 and 9, and multiply the 8 by 8 and so on.

$$\begin{array}{r}
 87.894321 \\
 \times 76.089762 \\
 \hline
 6152.602 \\
 527.365 \\
 7.031 \\
 791 \\
 61 \\
 5 \\
 \hline
 6687.855
 \end{array}$$

Ans. = 6687.86.

The 6 in the fifth decimal place of the multiplier only affects the result as regards the 5 in the third decimal place, and the 2 in the sixth place does not affect it at all.

Example: Find correct to the 8th decimal place the product of .002345678 and .0876532.

$$\begin{array}{r}
 .002345678 \\
 \times .0876532 \\
 \hline
 .000187654 \\
 16420 \\
 1407 \\
 117 \\
 7 \\
 \hline
 .000205605
 \end{array}$$

Ans. = .00020561.

DANS les premières opérations de l'esprit, que les sens soient toujours ses guides: point d'autre livre que le monde, point d'autre instruction que les faits. L'enfant qui lit ne pense pas, il ne fait que lire; il ne s'instruit pas, il apprend des mots. Rendez votre élève attentif aux phénomènes de la nature, bientôt vous le rendrez curieux; mais pour nourrir sa curiosité, ne vous pressez jamais de la satisfaire. Mettez les questions a sa portée, et laissez-les lui résoudre. Qu'il ne sache rien parce que vous le lui avez dit, parce qu'il l'a compris lui-même; qu'il n'apprenne pas la science, qu'il l'invente. Si jamais vous substituez dans son esprit l'autorité à la raison, il ne raisonnera plus; il ne sera plus que le jouet de l'opinion des autres.—Rousseau.

THE LEAVING CERTIFICATES OF THE SCOTCH EDUCATION DEPARTMENT.

THE latest circular of the Scotch Education Department, embodying important modifications in the existing method of granting Leaving Certificates, affords a suitable opportunity of reviewing the history of the scheme and of estimating its influence upon the higher education of the country. The gradual evolution of an efficient system of secondary education which it illustrates, and in which it has been a most important factor, has lessons for England which she may profitably study.

The Education (Scotland) Act of 1872, unlike the similar measure for England, conferred upon the Department the control of secondary as well as of primary education. But the onerous task of building up an adequate elementary system naturally tasked for many years all the energies of the Department. Secondary education was left uncontrolled and unguided, and every school was a law unto itself in organisation, curriculum, methods and standard. The best class of schools, with a strong university connection, still maintained a high level of attainments, but the general standard was very low. The institution of the Leaving Certificates in 1888, on the direct initiative of Sir Henry Craik, effectually rescued such schools from the chaos into which they were rapidly drifting. The scheme set up a standard of efficiency at which all could aim, and yet did nothing to crush the free development of individual schools. The impetus these certificates gave to higher education cannot be over-estimated. No better proof of this could be given than the fact that every recognised secondary school presents pupils for these examinations, and that the total number of candidates last year amounted to 17,000. The recognition of the certificates by the Universities of England and Scotland is a sufficient guarantee of the high standard exacted.

These certificates were issued in three grades—Lower, Higher, and Honours—for each subject in the curriculum of a secondary school. The issue of certificates for passes in isolated subjects was a radically wrong policy, and the principle of calling all such "Leaving" certificates—whether for passes in the lower grade of, say, English and Arithmetic, or in the Honours grade of Latin and Mathematics—was unjustifiable and misleading. In extenuation of the action of the Department, it should be recognised that an examination of any kind in secondary education was an innovation, and was regarded with suspicion, and the Department probably followed the line of least resistance. For many years the new certificates served admirably their intended function of stimulating the development of higher education, and of estimating to some extent its progress. But students of educational policy had noted growing defects in the system which seemed likely to impair its usefulness. Some of them, as already indicated, were inherent in the scheme, but the most serious

were due to the very popularity of the examinations and to the domination they had acquired over the whole field of higher education.

With teachers, school managers, and the general public, education was becoming more and more identified with leaving certificate results. The success or failure of a school was determined by the number of certificates obtained, and pupils of eleven and twelve years of age have been presented at the examinations in order to swell the number of certificates. The possibility of a "Leaving" certificate of a secondary school being obtained at the age of eleven or twelve carries with it at once the condemnation of the principle on which the certificate was based. In addition, the action of some County Committees, in allocating their grants according to the number of certificates gained, threatened to introduce into higher education the vicious principle of payment by result which has justly been discarded in the elementary system. For these reasons the radical changes announced in the new circular will be generally welcomed. Its leading features are:—

(1) Certificates will no longer be issued for single subjects, but for groups of subjects.

(2) Certificates will be of two grades, the Leaving Certificate proper, and the Intermediate Certificate.

(3) Candidates for the Leaving Certificate proper must be seventeen years of age, have attended for four years at a recognised secondary-school, and pass in four subjects on the higher grade standard, or in three subjects on the higher standard, and two on the lower. English and Mathematics are compulsory subjects for all, and Latin for all save Science students.

(4) Candidates for the Intermediate Certificate must be fifteen years of age, have attended two years, at least, at a recognised secondary-school, and pass in four subjects, of which one must be on the higher-grade standard. English and Arithmetic are compulsory subjects.

(5) The Department will only issue certificates to those who, in addition to satisfying the above conditions, are certified by the Inspector to have received a course of instruction of adequate range and quality, and to be proficient in those elements of the curriculum which do not admit of being fully tested by written examinations.

The Group Certificate. The outstanding feature in the new conditions emphasises the essential unity of all the subjects which go to make up that general education which it is the true function of a school to give. The single-subject certificate, on the other hand, supported the fallacy that education could be divided up into water-tight compartments with no relation to one another. It is not intended, in the meantime, to insist on all the subjects in each group being passed in one year, as the Department will issue a document to each successful candidate certifying the subject or grade in which he has passed towards obtaining the group certificate. It is to be hoped that this is only a temporary expedient to bridge the old and new systems, as its retention would perpetuate the evils of the old scheme and lead to specialisation

in certain subjects every year with a consequent neglect of others.

Compulsory Latin. But admirable as is the principle of a group certificate, its value depends on its application. Considering the many-sidedness of secondary education, justice to all demands that the grouping of subjects should be sufficiently varied to suit every type of school. In the Intermediate Certificate this is the case, and it promises to be a highly popular and useful factor in school life. But the conditions governing the Leaving Certificate proper are so reactionary in tendency, that one is at a loss to understand how they have come to be issued by a Department which has shown itself so anxious to build up an educational system suited to modern needs. The insertion of Latin and Mathematics as compulsory subjects renders the certificate a purely academic one. Indeed, it makes it merely another name for the university preliminary examination in Arts or Science. As only a small fraction of secondary pupils look forward to a university career, the great majority of pupils are to be sacrificed to the fetish of a classical education. It is in no wise the purpose of this article to belittle the value and importance of the classics as training instruments. But it is surely too late in the day to have to enter a plea for the impartial treatment of modern languages. The teaching of modern languages in this country has now reached such a stage that a training can be given in them, which is as effective and useful as any other that can be given within the same time. Lord Balfour recently said that, while the classics at their best were the highest means of culture known, yet the effective use of even one modern language was of much more value than the fragmentary knowledge of a classical language, which was all the great majority of pupils ever attained. Yet it is this fragmentary knowledge that the new circular seeks to impose on all pupils. The insistence upon this condition will have a disastrous effect upon the commercial schools that the Department has done so much to encourage. Such schools must either make the lower certificate the goal of their efforts, or remodel their curriculum and take up Latin instead of German. The better schools will adopt the latter alternative, as no higher school can long maintain its reputation when its full curriculum can only win a lower grade of Leaving Certificate.

In response to the representation of educational bodies throughout the country, the Department have agreed not to enforce the condition as to compulsory Latin till 1904. But the strong opposition with which the clause has been received should secure the entire abandonment of the regulation. So strong is the feeling in certain circles that the retention of the condition would eventually lead to the withdrawal of many schools from the whole system of Leaving Certificate Examinations. Such a result in the interests of schools and education would be very undesirable.

The Age Limit. Compared with the pupils who leave the English public schools, the Scottish youth certainly leave school very early.

In order to prolong the school life, and at the same time to remove the temptation to over-pressure of the pupils, the Department have fixed seventeen years as the minimum age for obtaining the Leaving Certificate proper. This will mean the addition of at least one year to the present average age of leaving school. Teachers are in general sympathy with the aims of the Department in this respect, but it remains to be seen whether the public appreciation of the value of the certificate will be sufficiently high to secure this additional year of school life. If the Education Department could attach to their certificates some of the exemptions and privileges of the *Abiturienten Examen* of German secondary schools, the success of the attempt would be assured. Failing that, the commercial community can infinitely enhance the value of the certificate by making its possession the necessary passport into their employment. Sir Henry Craik, in last year's report on higher education, emphasises this view: "The educational machinery of the country can never have a fair chance until merchants as a body set their faces against the practice of putting boys into business at thirteen or fourteen, and until in their selection of apprentices they give preference and reasonable encouragement to those who can produce evidence of having profited by their school training."

To ensure the hearty support of this class, upon whose attitude the whole success of the new departure depends, it is essential that modern languages should have absolute equality with the classics in qualifying for the Leaving Certificate Examination. If this concession is granted, the new scheme of the department will not only deserve success, but will do much to command it.

THE CRY OF PREMATURE SPECIALISATION.

By H. MACAN, M.A.

LORD ROSEBERY, in one of his recent eloquent disquisitions on things in general, deplored the extent to which the people of this country are being led away by catchwords and phrases, and so refuse to think out the problems of the day for themselves without the aid of the leader writers in the newspapers. A study of the educational controversies of the last ten years on the work and limits of the spheres of technical and secondary education respectively has led me to the conclusion that the phrase "premature specialisation" is in this category of catchwords, and so has been greatly misunderstood and, I fear, often intentionally abused.

The origin of the phrase lies with the first-grade secondary school, which prepares its pupils for a university career and the learned professions. When some thirty years ago the subjects of science and modern languages first began to invade the sacred portals dedicated to classics and at a pinch to mathematics, the advocates of "modernisation" as usual pressed their claims with undue ardour. Just as under the old *régime* the classical boy was

cut off his English, some of his history, and much of his mathematics at an early age so that he might devote his time to the elegant accomplishment of verse making, so the reformers claimed a rigorous and entire modern curriculum to be imposed upon the modern-side boy at an early age. As a protest against this, the phrase "premature specialisation" was invented by those very pedagogues who were keen to specialise almost from infancy as long as it was in those subjects which they themselves could teach. However, irrespective of its origin and to a large extent condemnatory of its authors, the truth of the phrase, properly understood, soon made itself apparent even to the most rabid man of science. The best and most successful science scholar at the university was not, it was found, the product of a technical forcing shop, but was one whose liberal and general education, not omitting even the classics, had been continued until he was sixteen or seventeen at least, and whose "specialisation," *alias* cramming for a scholarship, was carried on *pari passu* with the general work and general life of a secondary school. Oxford and Cambridge Colleges even were impressed by the discovery, and inserted essays, general papers or mathematical papers among the science papers in the competitions for their science scholarships. No longer was it customary for the science scholars to be "ploughed in Smalls," and consequently "Stinks" have become almost a respectable study. Hence the phrase "premature specialisation" became axiomatic and almost "Mesopotamic." It naturally followed that it became available for illegitimate purposes.

The meaning first dropped out of sight. Of course the sting of the phrase lies in the word "premature." Specialisation is not in itself an evil; in fact, everyone who affects to know "everything of something" must be a specialist, and must therefore at some time in his life have specialised. The doctor, the lawyer, even the parson, are specialists, and they have used the tertiary stage of their education for this purpose; it is not, however, yet necessary for a secondary schoolmaster to specialise unless it be in athletics. But none of the members of learned professions find it necessary to specialise except in the final stage of their education and after the secondary stage has fully run its course.

But what of those who from the very circumstances of their life and surroundings can only receive at best a second or third-grade secondary education, if any at all? For them the word "premature" must have a different meaning, and it is only ignorance which allows this word to be always used as if it were equivalent to "early." For persons who can have no tertiary education it is meaningless to say, "You must not prematurely specialise in the secondary stage." For those less fortunate still who can have no secondary education it is worse than folly to condemn a specialisation in the primary stage. The word "premature" must be used not in reference to any fixed standards of age and attainments, but entirely with reference to what is to come after,

and in view, as the Royal Commissioners had it, "of the life which has to be lived." Now it must be remembered that the vast majority of those whose education is supplied wholly or partly at the cost of public funds are of the class whose education must be truncated. They go to work before their education is finished, and have to finish it, if at all, in the evening class. Hence it follows, in the first place, that, as the evening class is a *terminus ad quem*, it must provide specialised instruction, and nothing which it can give is "premature." Not only so, but the evening-class student wants his knowledge (it is, of course, not education) as a means of livelihood, and of very immediate livelihood too. His evening lesson is to him as is the "pot-boiler" of the artist. He wants bread, and the educational theorist not only offers a stone but throws it in his face. To take a few instances. The real "educator" jeers at the new examinations of the Society of Arts adapted to the "genuine continuation schoolboy" because they lay stress on shorthand, book-keeping, tots and tables, and go so far as to begin French or German at the commercial-dictionary end instead of at the proper grammatical beginning. This, forsooth, is "premature," though there is no further educational stage, and these tricks of the trade if not learnt then will not be learnt at all; if they are learnt, the student gets his ten shillings a week converted into fifteen shillings, and the commercial machinery of the country has a more efficient wheel. Of course this is not education, but we cannot all be educated. The wise sneer not at these make-shifts, but try to prolong the process of instruction and divide it if possible into two stages of principles and practice, the continuation school and the polytechnic.

Again, the City and Guilds Institute expects its plumbers to have a knowledge of the properties of lead and solders and certain solvents, and its electric wire-men of parts of voltaic electricity and of the action of heat and cold on certain metals. Yet not one in a hundred of these men has ever been through a "course" in any science, they know not the atomic weights, and I doubt if they have ever heard that oxygen is not the same as hydrogen; yet they are better plumbers for this premature specialisation. Somebody must still hew our wood and draw our water, and, until at least that Saturnian age beloved of Russell Square or Cambridge returns, it will not be generally considered that a course of extension lectures is a necessary qualification for a Gibeonite.

When, however, we come to consider the day school with the truncated secondary education ending at fifteen (or seventeen at best), we are on more delicate ground. Here, of course, there is no question of teaching the principles of a trade, employment, or industry, much less of giving tit-bits of information useful to persons actually employed. The general scheme of work must be educational, and a well-ordered and coherent curriculum must prevail. I venture to say that between the ages of twelve and fifteen or twelve and seventeen this curriculum should be such as will fit the

pupils for the life which *in all probability* and *for the majority* must be lived. For these, in so far as the schoolmaster can mould the tastes or direct the abilities in a particular direction, their life should be as that of the white "slop" rather than of the black coat, of the bench or the "jigger" rather than of the counter or the counting-house. This means certainly for the third-graders the devotion of a large portion of time, possibly one-third of the whole, to acquiring "accuracy" by scientific and manual studies, and for the second-graders the devotion of possibly nearly half the school time to a systematic course in science and mathematics. Because such schemes would be "premature" for the first-grade boy going to a college at nineteen, they are not necessarily premature for a lad beginning to earn his living at fifteen or seventeen. The recent attack in *The Times* by Mr. Lyulph Stanley on the School of Science curriculum and the raging of the Elementary Teachers' Associations against the Higher-grade Minute are admirable examples of the folly of reducing all grades of education to a common denominator and erecting any title or phrase into a fetich, or even, I fear, a stalking-horse for political purposes. It is a little curious, moreover, that this discovery of the demoralising effect of devoting fourteen out of twenty-six hours per week to a specialisation in science or mathematics comes just at the time when School Boards are being legally warned off this very Tom Tiddler's ground upon which they used to "pick up gold and silver." Hence it behoves us to scrutinise keenly the knowledge, and possibly suspect the honesty, of all who throw at South Kensington or the County Councils this taunt of premature specialisation.

RURAL EDUCATION IN FRANCE.

THE seventh volume of the "Special Reports" issued by the Board of Education appears at an opportune moment, and gives us a detailed account of how our neighbours in France have endeavoured to tackle the problem of primary education in rural districts. It contains two reports, one by Mr. J. C. Medd, an active member of the Agricultural Education Committee, and dealing entirely with the rural schools in north-west France; and the other treating France generally by Mr. C. Brereton, who, as vice-president of the Jury on Primary Education at the Paris Exhibition of 1900, has had "excellent opportunities of coming to close quarters with the practical problem connected with the welfare of country schools."

The volume before us shows how greatly the proverbial uniformity of the French educational system has, despite the story of the minister and his watch, been varied to meet local needs.

Under the Third Republic, in the decade between 1878 and 1887, provision was made for the building and maintenance of schools, and the training and

certification of teachers; and, further, Ferry's three-headed scheme rendered education free, compulsory, and lay. Before this epoch elementary education had been, to a great extent, in the hands of the religious orders and the local clergy; but by the law of 1886 these schools were divided into state and private schools; "certain formalities were laid down for the opening of any new private school," while provision was made for those belonging to the state, but still in the hands of religious orders, gradually falling into line.

The entire cost of the state schools is borne in carefully adjusted proportions by the state, the department, and the commune; in our phraseology, by the central, local, and parochial authorities, and *la morale* is taught in the place of any denominational religion. The private schools, on the other hand, receive no aid except from their promoters; they are subject to inspection only as to morals and sanitation, and are gradually being starved out. Still, in 1897, out of the six million children receiving primary education, one-fourth were still in private schools.

Decentralisation has been the keynote throughout. Thus, in 1878, the onus was thrown on the commune of providing the buildings, with state aid; in the next year that of starting a training college was thrown on the department; even in the higher primary school, though the director is appointed centrally, yet that official in council with his staff draws up the programme of work for his school; and finally, for the purpose of education, France was divided into seventeen academies (universities), each responsible for the primary education of its area.

The "rector" is appointed by the President of the Republic, and has the normal and higher primary schools under his immediate control: for the ordinary primary schools there is an "Academy inspector," who has under him a staff of ordinary inspectors. These "Academy," or as we should say, "chief" inspectors, seventeen in number, are "the real pivot between the central authority and the schools"; in general they have been masters in secondary schools; while the ordinary inspectors are selected by competitive examination. At first these were generally taken from the ranks of the elementary schoolmaster, but a regulation requiring the attainment of certain degrees has somewhat restricted the field, and they are now almost entirely taken from the teachers in the normal and higher primary schools.

The striking point to the English mind is that the elementary school-teachers are paid directly by the state, a system which has been much advocated for England by those who are trying to level up the schools that receive no aid from the rates to those that do.

There is not room in a short notice to tell of the ingenious devices by which teachers and inspectors of all grades are joined in common efforts for the improvement of their pupils; of the adaptation of rural schools to the production of useful agriculturists; and of the variation in town schools, according to the trade of the district and the

probable future of the pupils, and of the important and much-criticised *certificat d'études* gained by the best children when they leave school.

For this and for much else, the reader must be referred to the volume itself. It would be interesting enough at any time: at the present crisis it is full of instruction both as to the ideals at which our educationists should aim and the pitfalls they should avoid.

THE WORKS OF CHAUCER.¹

CHAUCER now takes his place in the admirable series which has already comprised the works in a handy form of Homer, Dante and Molière. The only fault one can find with either the general scheme of these editions or the particular volume under notice is that in all the cases cited there is so much matter to be crowded into so little room that one finds the type inconveniently small. This is more than ever unfortunate in the case of the growing company of Chaucer's admirers, because, when once his metre and spelling and other idiosyncrasies have ceased to present any difficulties to a reader, there is no poet (save Shakespeare, perhaps) whom it is harder to put by.

For the work itself no abler editor could possibly have been selected than Professor Skeat, a list of whose works at the end of the volume induces the conviction that what he does not know about early English and its writers is hardly worth knowing. A critical discussion of the text as it is here presented would be of no service in this place. Suffice it to say that very obvious care and profound scholarship have been expended upon a task which is not by any means easy owing to the number and the difficulty of the MSS. which have to be consulted before any accurate idea of Chaucer can be gained. This is a matter for scholars rather than for *littérateurs* or for poets, and the textual interest of this volume will strongly appeal to that class. The inclusion of Chaucer's very inexact translation of the "De Consolatione Philosophiæ" of Boethius is welcome, as supplying in a handy form a version of a remarkable work of which some twenty other renderings exist (many of them dating from the eighteenth century, and some more trustworthy than this), but of which the translation of King Alfred the Great is too often considered as being the only one worth the consideration of English readers. The "Treatise on the Astrolabe," left unfinished by Chaucer, and taken in the first instance chiefly from Messahala, is also to be found here. The fact that Chaucer only left two parts of this work out of a projected five, however, strikes a modern reader as involving no great loss, either to the world at large, or to

"litel Lowis my sone," whose "bisny prayere in special to lerne the tretis of the Astrolabe" gave rise to it: yet who would be without Chaucer's view of the way in which "to know in special the latitude of oure countray. I mene after the latitude of Oxenford, and the heighte of oure pol?" Professor Skeat's introductory sections are very brief, and the "life" of Chaucer could not well have been made more like a dry compendium of annalistic details. Indeed, a good life of Chaucer, exhibiting his character and genius in an adequate way, in spite of Mr. A. W. Ward's book, still remains to be written, and in any case could hardly hope to find itself within the compass of a work like this edition. The hints on Chaucer's grammar, metre, and versification are likewise brief, but they succeed in covering the whole ground. It is, however, in his voluminous glossarial index that Professor Skeat displays his strength most absolutely. This part of the volume is as bulky as it is learned, and one may also say as useful as it is necessary. No one can tackle Chaucer comfortably without some such help, and Dr. Skeat has conferred upon the readers of this volume an inestimable benefit by the way in which this part of his work is done. The whole edition is thoroughly adapted to aid in spreading an adequate knowledge of the work of the first great English poet.

AN AMERICAN VIEW OF EUROPEAN HISTORY.¹

SOME little while ago, we drew the attention of our readers to Messrs. Rivington's "Periods of European History." To those who lack time, money, or inclination to buy and read that excellent set of volumes, we may recommend this volume from America. It contains within its 600 pages a sketch of European history, 350-1900 A.D. The title page and a note tell us that it has been "edited and adapted for use in British Universities and schools" by Mr. Hassall, who has "altered the spelling of many words, remedied certain omissions and corrected some errors in detail." We still remark several minor misprints and slips of which perhaps the most curious are "judicial jurisdiction" (p. 195) and "Dante, De Monaschiri" (p. 121). There is no clear distinction between monks and friars. Savonarola is a "monk," and (on pages 281 and 286) so is Luther, though the latter is at first described correctly as an Augustinian friar. "Folkland" is still regarded as equal to "public land," and Justinian's is described as the first codification of Roman law. John Hampden's dispute is presented as if it were a criminal not a civil case, for he is "arrested and tried." Surely when Poland was united with Lithuania (p. 236) it was not Poland that acquired. If so, it was a case of "catching a Tartar."

¹ "Chaucer's Complete Works." Edited by the Rev. Professor W. W. Skeat, Litt.D. (The Oxford Poets.) xxiv. + 732 + 149 pp. (Glossary.) 1 vol. (Henry Frowde.) 9s. 6d.

¹ "A General History of Europe." By O. J. Thatcher and F. Schönl. (Murray.) xxi. + 584 pp. 9s.

But to speak of the book as it probably left the hands of its American authors. On the whole, it is a worthy production of the University of Chicago in which Messrs. Thatcher and Schwill are professors. The general reader and the incipient student will learn much from its pages. There are good genealogies and maps. The bibliographies are inclusive rather than judicious. Among many real "sources of information" are included also many that are merely manuals and compilations, and there is, at any rate in those which head the chapters, no attempt at discrimination.

Among the paragraphs which strike us as both new and good are those in which the authors explain that feudalism was not a system, defend the middle ages from the charge of being unintellectual, and describe the rise of Mahomed and Mahomedanism. The account of mediæval ecclesiastical matters is too much inspired by Milman, and in consequence there is an excess of anti-clerical bias. Not enough emphasis is laid on the difficulties of the Cluniac movement. The eleventh-century reformation is therefore presented too much as a mere advance of the papacy, not sufficiently as an uplifting, inspired by a higher conception of the character of the Christian Church. In a similar way, though it is highly desirable that the popular view of the Crusades should be corrected, we think the sympathies of the authors with Mahomedan culture have led them to depreciate too much the ideals of the early crusaders and to ignore the statesmanship of some of the best among them. We think, too, that the natural sympathy of American authors with democratic forms of government has led them to antedate ideas and practices in English constitutional history both early and late, and has altogether vitiated their treatment of nineteenth-century European movements. They have no sympathy with the Metternich school of politics, and in speaking of the Greek revolt use the quite unhistorical phrase, "the inalienable right of every people to liberty and self-government" (p. 493). Whatever may be the orthodox creed in the United States, there are some of us on this side the Atlantic who cannot pronounce this "shibboleth." But if sufficient allowance is made for this "liberal" bias, we think a perusal of this book will be useful to many of our readers.

Barbara West. By Keighley Snowdon. 382 pp. (John Long.) 6s.—According to the author, "Barbara West" was written with two ends in view: to advocate more definite teaching for young people on the most important of all social questions, and to plead for greater leniency towards those who transgress the received conventional code. In the second of these aims he has been successful. No one with a human heart can fail to be moved by this most pitiful and lifelike story. But we cannot see that it has any bearing whatever on the writer's first point. The terrible catastrophe is brought about by reckless folly on one side and villainous baseness on the other. Of ignorance, in the ordinary acceptance of the term, there is no suggestion. Barbara, poor little butterfly, is not in the least blind to the dangers she incurs, as a girl in a better social position might conceivably have been. She simply concludes to risk them. Dreading marriage as a bar to her artistic career, she discourages an honourable suitor, but cannot forego the dear delight of flirtation carried to its extreme limit.

EDUCATION IN GREEK AND ROMAN TIMES.¹

THIS book contains more and at the same time less than its title might seem to imply. It not only contains some account of the educational significance of Plato and Aristotle, and of Cicero and Quintilian, but it gives a whole body of educational passages translated from their works, so that Greek and Roman education is set forth in accepted translations in all the fulness of treatment to be found in the writings of those authors specially dealing with education. Nor is this all. Portions of such writers as the following are given from the Greek: Plutarch, Thucydides, Xenophon, Aristophanes, Isocrates, Plato, Decrees of the Athenian Senate and Assembly, Gregory Nazienzen;—from Latin: The Laws of the Twelve Tables, Suetonius, Plautus, Tacitus, Cornelius Nepos, Marcus Aurelius, Horace, Martial, Seneca, Pliny the Younger, Juvenal. The passages, which are thoroughly comprehensive, are prefaced by interesting introductions either stating or suggesting the educational significance of the passages quoted in relation to contemporaneous civilisation and progress, and especially noticing the historical continuity of educational systems and ideas. Such a book is clearly an excellent text-book for the history of education in Greek and Roman times. It leads the student to consider the main mass of the material for forming judgments at first hand. In the writer's own words: "It renders accessible to the student with limited time and limited library facilities the ideas of the Greeks and Romans concerning education, and such descriptions of their educational systems as are given in their own literature." It certainly leaves no excuse for the ordinary student to take down his lecturer's lectures and reproduce them as his own ideas without any direct study or personal references to the authorities on which all sound judgments must be based. Such a collection of passages comprehensive and illustrative of the history of education is distinctly valuable in itself, showing probably a much larger amount of material than is ordinarily supposed to exist. It is even more valuable in the suggestion conveyed for a method of direct study, and as a means of carrying such study into effect.

This "source book" also contains less than might be expected from its title, in that it does not pursue the byways of research, "such as inscriptions, vase and mural paintings, and other art works." But what is more surprising is that, apparently, there are no references to the works of authors on the history of education amongst the Greeks, e.g., P. Girard, "L'Education Athénienne," or L. Grasberger, "Erziehung und Unterricht in Klassischen Alterthume," or Laurie's "Pre-Christian Education." References to these and other books of a scholarly character on the subjects treated even in footnotes would not take

¹ "Source Book of the History of Education for Greek and Roman Period." By Paul Monroe. 515 pp. (Macmillan). 10s. net.

away from the purpose of the source book, and in certain respects would enhance its usefulness to the student. We welcome the book as distinctly deserving recognition by the teachers and students of the subject. Indeed, it prepares the way for training colleges and university lecturers to introduce the subject into courses on the history of education where they have hitherto neglected this period and treated education as if it only was worthy of study historically after the time of the Italian Renaissance.

THE DAWN OF MODERN GEOGRAPHY.¹

IN a volume published some years since Mr. Beazley told the story of "The Dark Age of Geography"—from the Conversion of the Roman Empire to the close of the ninth century. In the present volume he begins with the period which, from the standpoint of West European civilisation, was most emphatically "the Dark Ages," but which, from his point of view, is truly described as "the Dawn"—for the Northman raids which plunged ninth-century Europe into gloom are to the historian of Geography an age of growth and enlightenment. Commencing with the explorations of the Northmen, he proceeds to deal with pilgrim travel to Palestine, Hebrew travellers, diplomatic and missionary enterprise in the Far East, commercial intercourse both within and without the Mediterranean; and he concludes with an exposition and criticism of the ideas of notable geographical writers and map-makers, and with a description of typical maps of the period, admirably illustrated in facsimile. It is to be hoped that the author will proceed with the intention, more or less obscurely expressed, of carrying on the story with the exploits of Marco Polo and Henry the Navigator.

Mr. Beazley is to be envied—though not grudged—the opportunities which he has had during the past ten years for the study of this extremely fascinating subject; he is to be congratulated on not falling into the mire of superfluous manual-making; and his present work shows a great advance on the "popular" biography of Henry the Navigator which some seven years since he contributed to "The Heroes of the Nations." But unfortunately he is still much superior in the import than in the export business. He seems to have read conscientiously and understandingly everything worth reading on his subject, contemporary and later; and he has here set forth the results of his reading and thinking in a sufficiently clear and well-arranged manner; but he has not achieved the distinction of welding his materials into a living piece of literature.

In this place we have to consider books not so much as literary compositions or as contributions to learning, but in regard of their utility to the

school world. And from this point of view Mr. Beazley's book must be warmly welcomed. In a comparatively small compass, it contains very much that the diligent teacher of history, geography or literature will find uncommonly new and useful in filling-in his mental background as to mediæval ideas. Such great men as Olaf Trygvason, Saint Olaf, Magnus Olafson, and Harald Hardrada—who flit like phantoms across the pages of our text-books—here become sufficiently real to us to make us ask for more. The activity of the Northmen—one wonders whether there is any good reason for Mr. Beazley's confusing adoption of "Norsemen" in a general sense—and its sequel, the Crusades, here take their proper place as "epochs" in European history and not as mere meaningless and troublesome interludes in English history. Another striking characteristic of the Central Middle Ages is brought into prominence, and that is the absolute indifference and contempt of good Christians for everything pagan. Saewulf of Gloucester, for instance, cheerfully mixes up the Colossus of Rhodes with the Colossians of the New Testament, the Syrians and the Assyrians, Babylon in Egypt with Babylon in Mesopotamia; and to him Athens is merely the place "where Paul taught." The mediæval pilgrim will be found a fine quarry for journalists or others in search of new schoolboy "howlers." And to all serious teachers Mr. Beazley's volume will be found invaluable. In particular we may commend a perusal of the book to teachers working at the period of European history prescribed for the Oxford Local this summer.

PROGRESSIVE EDUCATION.

It is a national misfortune that the people who control a large part of the educational work of this country are inadequately equipped for their responsibilities. Local influence will secure a candidate's election upon the School Board far more easily than expert knowledge, and political speakers please the public with their platitudes while men who are familiar with many aspects of education remain silent. Most of us have neither time nor inclination to go into the public arena and say what we know, though we may occasionally be visited by an uncomfortable feeling that the duties of citizenship are neglected by this abstention. But when we see men competent by experience to speak on educational topics instructing the public in the aims and methods of school work, we are grateful for their efforts. This sentiment is inspired by an address delivered recently at Accrington, by Archdeacon Wilson, before a large audience of co-operators. Experience gained at Rugby, Clifton and Rochdale, and sympathetic contact with men of many classes, give his views on education exceptional value, and make his remarks such as can be read with interest by teachers as well as the laity. We cannot even mention the many points touched upon, but the following extracts from his speech describe defects, and suggest reforms, which must be borne in mind if educational work of the future is to proceed on rational lines:—

"Why is it that we English, compared to the Germans, the French, the Swiss, and the United States of America, care so little for education? I assume the fact as obvious. The most neglected domestic animal in England, it has been said, is the

¹ "The Dawn of Modern Geography. Part II. A History of Exploration and Geographical Science from the Close of the Ninth to the Middle of the Thirteenth Century (c. A. D. 900-1260)." By C. Raymond Beazley, M.A., F.R.G.S. xx. + 651 pp.; 16 maps. (Murray.) 18s.

child. Other nations consider the training of their children's bodily and mental faculties as of primary importance; they think it a national interest to educate all as far as may be, and to select and give the best possible stimulus and assistance to those few who possess real ability; and therefore they provide the most advanced teaching in science, and in literary, and commercial, and technical subjects. They believe that money so spent on a few brings gain to all. They further believe that education is a real science founded on observation and experience, and both study and teach it as a science; and therefore insist on the presence on their local Boards of Education of some members chosen for the sake of their educational experience and judgment. That is, of course, the very last thing we should think of in voting for a member of a School Board, even if we thought of it all. They think that the training of a teacher, and then the setting him free to work out his own results, with a Board over him which has in some of its members the intelligence to perceive anything remarkable in those results—that this is the surest way to develop the originality and intelligence of teachers and scholars.

"The prime factors of success in any progressive profession or business, given of course good health and vigour, are intelligence and character. Confining ourselves for the present to intelligence, we can see that what is wanted in all such professions and occupations is the power of perpetually facing new circumstances and conditions, such as have never occurred before. In the professions, clerical, military, and medical, we are always being brought face to face with what is new. It is fatal to a clergyman, a general, or a doctor to think that he can dispense with that habit of mind which regards every problem as a new one. Our engineers of all kinds, our manufacturers, our tradesmen, our merchants, have in the same way to meet ever varying conditions, to make new inventions and designs, to find new markets.

"Our education could be throughout the whole course directed far more than it is to the development of originality and insight. To give children the delight and the power of inventing, of doing something for themselves, is the secret of developing their power. Germany promotes research in its higher schools. There is no branch of education the treating of which, and the examination of which, is not influenced by this aim. Of course there are subsidiary processes, such as writing, drawing, and summing, which are almost mechanical, and must be learnt. But we have allowed these subsidiary processes to eclipse the real work of education, which is to develop resourcefulness. The defect becomes more conspicuous, more fatal, as we rise above elementary schools to the higher elementary, secondary, and technical schools of our country, and even the Universities. Of course, it will be said that in our schools there are laboratories for practical work. Yes; but practical work may be so taught as not to encourage the attitude of mind implied in research; and I have no hesitation in saying that it usually is so taught in England.

"The voices of our great educationists have failed to awake our people to that fact. Slowly, however, Cambridge has become a school of investigation in history, criticism, and theology, and Oxford is following suit; but in no branch of learning is research so fully the atmosphere of the place as it is in German Universities and those of the United States of America. Or to turn to another level of education, the public schools of England made an effort in the 'sixties to engraft science in their course of studies; and at first it was introduced on wholesome lines of research; but the competition for scholarships, which can rarely test original powers, has largely damaged the methods of teaching. And in the science and technical schools of the country, the same fatal effect of the examiner, and of the teacher who is not himself a learner, is seen. We seem to feel no security that we shall get our money's worth out of a teacher, unless we exact from his pupils so large an amount of producible knowledge that they have no time or desire for original work, and from himself so many hours of work that he has neither time nor heart to learn, even if he had the power. Now you should insist that in educational authorities there shall be represented, by nomination or co-optation, those whose interest is in research—men of science and literature, who look at educational questions from the highest point of view. Preference in educational appointments should be given, where possible, to men who show power for research, rather than to men who accumulate first-class certificates in every branch of knowledge. The love of research in the active, fermenting

mind is contagious. It is the first condition for the teacher of everything beyond the elements. It saves teachers from the deadly sin of dulness. Again, you can, if you will, set your faces against the vulgar depreciation of classical education. After all, no substitute for it has been found. Latin or Greek do train in boys the faculty of problem solving, or investigation, more completely than any other subject taught by any method yet invented; and hence they give a certain readiness to acquire new knowledge, a sort of capacity, which is what most men need. The Germans, therefore, train their promising boys on sound classical lines before they specialise in scientific investigation, and they are right both in theory and in fact. Boys so trained in a kind of research acquire the methods and the spirit of investigation in science far sooner than boys trained in a miserable course of what is called English grammar and commercial geography."

CURRENT GEOGRAPHICAL TOPICS.

By DR. A. J. HERBERTSON, F.R.G.S.

Colombia.

THE northern portion of the Andes has its political difficulties, which are more dramatic if less interesting to the geographer than those of the southern portion discussed in the December, 1901, number of THE SCHOOL WORLD. One of the political outbursts, which are normal events in the evolution of so many South American states, has recently occurred, and stirs in us much the same interest as an outburst of one of the many active South American volcanoes. One is tempted to explain both as due to too thin a skin—in political rivals in the one case and of the Earth in the second. More seriously, however, we may certainly trace an indirect geographical factor in these recurrent revolutions. They are partly due to the diverse geographical conditions which determine opposing interests, the din of whose encounter faintly stirs us. We forget the vastness of South America, and the paucity of its inhabitants. The discipline of the give-and-take adjustments of crowded areas is wanting. A community with one set of interests is isolated in one district, another community with perhaps rival interests is isolated in another; they come into contact in the legislative chambers and executive offices. Personal ambitions no doubt also count for very much, and, in countries where legal luminaries and military commanders control both legislation and administration, fighting—of different varieties no doubt—is the trade of both types of its rulers, who flourish on quarrels. South American revolutions, like measles, are not to be treated too seriously. They may have bad effects, and this or that individual state may even succumb. On the whole they are merely manifestations of youth, of life unadjusted to its environment and still struggling with it. They will become obliterated as the current of life shapes them, just as the irregularities of an immature landscape are gradually eliminated as the current of its rivers smooths them.

The problem is the opposite to that of our country with its crowded cities, where there are too many people for the available land, for in South America there is too much land to be exploited by such a handful of people. Take Colombia, for instance, and accepting the *Statesman's Year Book* estimates of its still partly undefined area, it contains over 500,000 square miles, or over 10 Englands, and about 4,000,000 people, or one-eighth those of England. In Colombia there are 80 acres for every man, woman and child compared with little more than one acre to each in the case of England. The mountainous nature of Colombia is no doubt partly responsible for this, but for a country extending from 1° S. and 12° N. it is an advantage to be mountainous.

The mountains and valleys of Colombia spread out like the ridges and furrows of a half-open fan from the handle at Pasto. The coastal ranges (Cordillera de Choco) are low, and the valley which lies to the east of them is drained to the south and the Pacific by the San Juan river, and to the north and the Atlantic by the Atrato, an easy route by which it has even been

tated over a perpendicular cliff into a deep gorge some 600 feet below" (Tequendama falls).

The rainy season, or "winter" (*invierno*), lasts from the end of September to the end of the year, and consists of a succession of thunderstorms and bright spells—the dry season, or "summer" (*verano*), lasts from December to February. In March rains begin on the eastern mountain slopes, and continue in the west until May, in the east until July.

The climate of Colombia, however, varies greatly, and would require a special article to describe (See Hettner's "Die Kordillere von Bogota," *Petermann's Mit. Ergänzungsheft*, 104.)

Wheat and other cereals and potatoes are cultivated. Sowing and reaping may be seen at the same time, and two or three crops may be raised in a year. Many cattle are kept, especially on the Llanos east of the mountains crossed by tributaries of the Orinoco.

Minerals abound. Coal, iron and salt (from which the Government obtains much revenue) are found on the Bogotán plateau, and gold on the Antioquia plateau.

Railways are slowly being built up the steep slopes to these plateaus, from Puerto Berrio to Medellín, the chief town of Antioquia, and from Jirardot to Bogotá, a city of some 120,000

inhabitants. Bucaramanga is the centre of the chief coffee district. Two towns are keys to the Magdalena Valley. Cartagena, famous in the days of Spain's greatness, is losing in importance as that of Barranquilla, near the mouth of the Magdalena, with its sea-port of Puerto Colombia to which it is joined by a railway, increases. The Meta and other rivers of the Llanos may form important routes to Colombia when the country is opened up.



proposed to carry an inter-oceanic canal. The rainfall in this region is excessively heavy, and the Atrato is estimated to carry more water to the sea in proportion to its drainage area than any other river. The mountains are dark with dense forests.

The main ranges diverge in three lines, forming the Western, Central and Eastern Cordilleras of Colombia. Between the Western and Central ranges the Cauca, and between the Central and Western ranges the Magdalena flow northwards to the Atlantic.

The Cauca is a rapid river dashing down through deep gorges. The upper streams of the Magdalena are also torrential, but much of the course is through a flat valley, and is rarely broken by rapids, the chief being near Honda. From 7° N. to the sea it winds with many loops across a swampy plain. The valleys are all richly wooded, and yield rubber and other forest growths. Cacao, coffee, tobacco and maize are cultivated.

Most Colombians live on the plateaus, especially on those of Antioquia and Bogotá. A description of the latter by Mr. W. L. Scruggs ("Colombian and Venezuelan Republics," Low, 1900) gives a good idea of the plateaus:

"It may be compared to a great oval dish, the high circular wall of treeless mountains corresponding to the outer rim. The entire plain is a treeless prairie, but well-watered by a number of small fresh-water lakes and numerous running streams . . . Just before reaching the edge of the plateau the Funza (or Bogotá river) runs with a deep and rapid current, and is precipi-

A "Table of Holiday Courses on the Continent for Instruction in Modern Languages, 1902," prepared by the Special Inquiries Branch of the Board of Education for circulation for the information of students and of educational authorities, can now be obtained on application to the Board of Education Library, Cannon Row, Whitehall, S.W. Courses have been arranged in Germany, at Greifswald, Jena, Kiel, and Marburg; in Switzerland, at Geneva, Lausanne, and Neuchâtel; in Spain, at Avila and Santander; and in France, at Caen, Grenoble, Honfleur, Nancy, Paris, Tours and Villerville-sur-Mer. The "Table" gives full information as to dates, fees, return fares from London, lowest cost of pension per day, the principal subjects of study, and other important details. Since, in addition, the names and addresses of the gentlemen in charge of the respective courses are also given, and further information can be obtained from them, the pamphlet is indispensable to the teacher who thinks of attending a holiday course.

ITEMS OF INTEREST.

GENERAL.

ALL teachers and other students of education are familiar with the "Cockerton" case and its bearing upon the legitimate scope of School Board activities. A second discussion has arisen, and this, too, is associated with the name which has now become historic. Certain ratepayers have objected to the application by the London School Board of public rates to the erection and maintenance of buildings for the purposes of pupil teachers' centres. It is contended for the objectors that expenditure on these special schools is *ultra vires*, and that by the judgment given in the Appeal Court in "Rex v. Cockerton" it was settled that School Boards only have power to give elementary education and that to children. It is, on the contrary, urged generally by the London School Board that they have the right to educate their own pupil teachers and prepare them for examination preparatory to entering the teaching profession. The question has yet to be decided; but it seems clear that, should it be ruled that the education of pupil teachers is no part of the work of School Boards, no time must be lost in making quite evident whose duty it is to look after this important educational work.

THE recent dismissals of assistant-masters at Merchant Taylors' School again raises the vital question of security of tenure. Five masters of long standing, whose periods of service vary from twenty-five years downwards, have received notice, some with no compensation, one with a year's salary, and a third with a solatium of £100. The responsibility for these proceedings would seem to be with the Court of Assistants of the Merchant Taylors' Company and not with the Headmaster. The custom at Merchant Taylors' has been to pension masters after a long service, and in view of the presumption under which the dismissed masters have worked, that they would be similarly treated, this abrupt termination of their engagements is particularly hard. Such deplorable instances as these, which are far more frequent in minor secondary schools throughout the country than in the greater public schools, show with vivid distinctness the need which exists for a right of appeal for assistant-teachers to some impartial tribunal of high standing.

THE Board of Education have not agreed to the request of the Incorporated Associations of Head and Assistant Masters for a complete inquiry into the present conditions of tenure in secondary schools; the majority of schemes of the Charity Commissioners give the headmasters of endowed schools absolute power in the matter of appointing and dismissing their assistants; and well-considered pension schemes for masters and mistresses in secondary schools are still exceptional. It is painfully evident, therefore, that the Associations of Assistant Masters and Mistresses have still plenty of work to occupy all their energies in the direction of convincing the authorities of the need for radical changes in the status of the assistant teachers in secondary schools. After all, the success of any system of national education depends ultimately upon the teacher; and unless, by removing all his anxiety as to his future, we leave him free to use his best efforts in educating our children, we cannot reasonably expect much improvement in the work of our schools.

REPLYING to questions by Colonel Lockwood, Sir John Gorst recently informed the House of Commons that schools conducted for private profit could, if efficient, become "recognised" schools in accordance with the recent Order in Council

regulating the registration of teachers, and that the publication of a list of recognised schools is to be considered by the Board of Education.

A COMMITTEE has been formed to promote a Nature-Study Exhibition to be held in London about the end of July. It is suggested that the Exhibition should be open to:—(1) urban and rural elementary day schools; (2) continuation schools; (3) higher grade schools (boys and girls); (4) Home Office schools; (5) secondary schools (boys and girls); (6) other institutions and colleges. Prizes or certificates will be offered in each class for:—(1) The best collection of common dried plants, injurious insects, &c., apparatus for class lessons, drawings made in class of natural objects, home-made maps, note books, natural history calendars, plans of gardens, photographs, models in clay or plasticine of natural objects, plants grown in boxes and pots, rustic carpentry and similar objects. (2) The best individual exhibit of one pupil's work. (3) The best scheme of instruction and descriptive account of work, methods, &c. A strong executive, which will shortly issue a detailed schedule, has been appointed. Sir John Cockburn is the Chairman of the Executive, which also includes such well-known educationists as Sir Thomas Dyke Acland, Sir John Dorington, M.P., Mr. Henry Hobhouse, M.P., and Mr. M. E. Sadler. Mr. John C. Medd, Stratton, near Cirencester, is acting for the present as Hon. Secretary, and Mr. C. S. Roundell, 7, Sussex Square, Brighton, as Hon. Treasurer. The expenses of organisation and for printing, advertising, hire of hall, &c., will necessarily be considerable, and donations in aid of the scheme are invited.

THE Board of Education, South Kensington, has issued a Memorandum, stating that: "In view of the date appointed for the Coronation of Their Majesties, the day examinations fixed to be held during the week ending June 28th next will be held during the week ending July 5th." A revised copy of the timetable has been issued accordingly.

PARTICULARS have now been published of the Modern Languages Holiday Courses for 1902, arranged by the Teachers' Guild. French courses will be held at Tours and Honfleur and a Spanish course at Santander. At the French centres the lectures will commence about August 1st. The exact dates will be published later. There will be a three weeks' course at Tours, with an additional week if a sufficient number of students wish it. At Honfleur there will be twenty lecture days (extending over nearly four weeks), and at Santander the course will run from August 5th to August 25th. Towards the end of the courses, at each of the French centres, examinations will be conducted by a Board of French Professors, to test the progress and proficiency of the students. These examinations will be of two grades, elementary and advanced. Each will consist of two parts: (1) a written composition; and (2) an oral examination. The elementary examination will be intended to test the power of the student to write and speak French and to understand it when spoken, with fair correctness and facility. The advanced examination will aim at testing the power of the candidate to teach the French language efficiently. The representatives of the English Committee are for 1902:—at Tours, Mr. A. Wilson-Green, Blackheath School, Blackheath, S.E.; at Honfleur, Mr. Sheldon R. Hart, the Grammar School, Handsworth; at Santander, the Rev. H. J. Chaytor, 21, Alexandra Road, Great Crosby, Liverpool; to whom (according to the centre chosen) intending students should send their names as early as possible.

NONE of the Cretan discoveries has excited keener interest than the long series of documents in the new script, or scripts if

there are really two. Mr. Evans, we understand, is hopeful that he is on the track of the interpretation; but the rashness in theorising which he has shown in identifying the discovered palace with the Labyrinth has somewhat shaken our confidence in him. We are inclined to think that affinities will not be found between this script and the Egyptian; there may have been several alphabets or syllabaries independently developed in the Aegean area, as there have been in the Siamese peninsula. But it is worth noting, because nothing is too small to note, that some of the most mysterious letters of the Greek alphabet resemble some of the Cretan signs; and that some signs resembling the Cretan have been found on remains of the prehistoric Egyptian period and later (*Journal Anthro. Inst.*, 1899, plate xxviii.). Among the recent acquisitions of the Ashmolean Museum is a four-sided seal which bears linear signs not dissimilar. But our only hope of really deciphering these tablets lies in the chance of finding a bilingual inscription like the Cypriote inscriptions.

THE German Modern-Languages Association, which has upwards of 1,200 members, was formed for the purpose of propagating and encouraging the study and knowledge of modern languages. General meetings are held every other year for lectures and debates on the best methods of studying languages. A meeting will take place this year, during Whitsuntide, at Breslau, when, in addition to the other events, there will be an exhibition of books and periodicals dealing with the teaching of modern languages.

IT is proposed to hold a Conference at Warwick Castle, on May 1st next, to provide an opportunity—(1) for those engaged in the lighter branches of agriculture or rural industries to make known their work; (2) for those who are interested in the welfare of country districts to learn what is being done to stay rural depopulation; (3) for an interchange of ideas between those engaged in allied industries; (4) for those who need teachers or trained workers to meet those who are capable of teaching others; (5) for the binding of all these in one strong organisation for co-operation. Persons interested in the objects for which the Conference is called are invited to write for particulars to the Warden, Lady Warwick Hostel, Reading; or to Lady Warwick.

THE important and inspiring discourse recently delivered to the Royal Institution by Mr. H. G. Wells, entitled "The Discovery of the Future," has been published in book form by Mr. T. Fisher Unwin. The book may be obtained bound in cloth for two shillings, or in paper covers for one shilling. Mr. Wells is so well known to our readers as a successful schoolmaster, who has developed into one of our most popular writers and profound thinkers, that it is unnecessary to do more than note the publication of his last book to ensure its perusal by them.

OUR readers will have noticed that we have constantly laid much stress on the use of historical novels as aids to the teaching of history; and our correspondence, published and unpublished, has shown that our efforts to help teachers in this matter have been warmly appreciated. It will, therefore, be good news to many to know that Mr. Elkin Mathews has in the press a comprehensive "Guide to the Best Historical Fiction," compiled by Mr. J. Nield. This book does something more than bring up to date the excellent "Descriptive Catalogue" compiled by Mr. Courthope Bowen nearly twenty years ago; it differs from that book, not only in method of arrangement, but also in being "select," not "complete," and in being based on the study of the books themselves, not, as the previous list confessedly was, on the study of publishers' catalogues. The list includes some eight hundred novels and tales, arranged in approximately chronological order and briefly described.

MESSRS. EYRE AND SPOTTISWOODE have published excellent portraits of the King and Queen which are sufficiently large to hang in school and class rooms. The published price of the pair of pictures, which are very effective reproductions, is 5s. 9d., unframed, carriage free to any part of the United Kingdom. Frames of various kinds can be obtained from the publishers, who will send full particulars on application.

AN anonymous writer who signs himself "Vigilans" contributes to the current number of the *Fortnightly Review* a pessimistic article entitled "England's Educational Peril." He endeavours to justify the recent well-known criticism of the education of our public elementary schools as "shoddy education," and to trace the causes that have led to our "deplorable shortcomings." The writer then proceeds to suggest some necessary and possible palliatives and remedies. The instances given to justify the criticism of our system of elementary education are, to say the least, inconclusive; they afford an example of what the teacher knows as "generalisation from insufficient premisses." Throughout his article the writer's desire to justify and extol all the actions of the present Education Minister has introduced a bias which detracts considerably from the value of his criticisms.

MISS VIOLET A. SIMPSON a short time ago came accidentally into possession of an old prospectus, of 1787, of a Girl's Boarding School held at Salisbury. A study of the aims of the Lady Principal as set forth in this prospectus led to an inquiry into the subject of "School Life a Century Ago," with the result that we have in the *Cornhill Magazine* for March a delightfully entertaining article on the subject. The immediate consequence is that we must correct the ideas we have gathered from Charlotte Brontë and other writers. The fact seems to be that the girls of a hundred years since were well looked after and had a very good time, and the article shows that this is as true of the schools abroad, to which English misses were sent, as of the academies at home. We commend this entertaining essay to our lady readers.

FORMS of application for permission to attend the examination for admission to the Royal Military Academy, Woolwich, and the Royal Military College, Sandhurst, must be returned to the Secretary, Civil Service Commission, S.W., on or before April 1st next. The date of commencement of the examination is July 1st, and candidates must be between the ages of 16 and 18 on that date. The subjects of examination are mathematics, Latin, French, German, English composition, chemistry and heat, geometrical and freehand drawing, geography, Greek, English history, physics, physiography and geology. There are certain restrictions as to the number of subjects which may be offered, the restrictions for Woolwich differing from those for Sandhurst. The fee for attending the examination is £2 in London, and £3 at provincial centres.

SCOTTISH.

AT a meeting of the Executive Committee of the Carnegie Trust, the reports of the secretary and treasurer were submitted, and showed that fees had been paid by the trust to 2,441 students, at an expenditure of £22,941 16s. 6d. It is well known that the benefits of the funds were, in the words of the trust deed, intended by the benefactor for "the deserving and qualified youth of the country to whom the payment of fees might act as a barrier to a university career." For the first year the Committee determined to apply no test in regard to applicants, save that of scholastic qualifications. To have made an inquisitorial scrutiny into the circumstances of the individual candidates was impossible, in the short time

at their disposal before the opening of the college session, and in any case they thought the determination of the term "deserving" might be left to the good sense and conscience of the students. According to Principal Story, this policy has been a failure, as many have obtained the benefits of the trust who were perfectly able to pay their own fees. While the Committee will be well advised to inquire into this charge, it is hoped they will not without grave deliberation depart from the principle of this year's allocation of the fee funds.

THE first annual report of the Executive Committee was submitted to the members of the Carnegie Trust at Westminster Palace Hotel, London. The trustees, after approving the report, discussed various points of future policy. They were unanimous in supporting the view of the Executive Committee, that there should be no inquiry into the financial circumstances of the students. The necessity of maintaining a high and uniform educational test was generally recognised, and it is probable that medical students wishing to participate in the benefits of the scheme will have to pass the Preliminary Examination on the Arts' standard. This will mean a very serious raising of the standard, so far as they are concerned, but no hardship is thereby entailed, as they are only put on the same platform as students in other faculties. Post graduation work was another subject that was under review. Post graduation work has never been a feature in the Scottish Universities, and where it has been attempted it has been on a haphazard and unorganised basis. The trustees intend to establish research fellowships under conditions which will ensure research of the highest character in the different departments of study.

THE third annual Conference in the interest of Modern Languages at the various Universities took place this year in the Students' Union, Glasgow. Reports submitted regarding the status of modern languages in the universities showed that the number of students in French and German steadily increases. The Conference did not regard with favour the proposal to establish special entrance bursaries for modern languages. They claimed that justice to the subject demanded that they should be admitted to equal competition with other subjects at the general bursary examination. It was resolved to recommend to the Carnegie Trust that in view of the urgent requirements of modern languages in the universities a certain portion of their trust funds should be set aside for the better equipment of the modern language department by means of instituting chairs, and research and travelling scholarships.

THE Teachers' Guild, at a recent meeting in Glasgow, had under consideration the new regulations for leaving certificates. The principle of the group certificate was heartily welcomed by all the speakers, but it was held that its value was greatly discounted by the rigidity of the basis upon which groups could be formed. The following resolutions were unanimously passed:—(1) That the new conditions whereby candidates taking two modern languages are deprived of their eligibility for the leaving certificate on equal terms with candidates taking any other two languages marks an abandonment of the impartial attitude hitherto preserved by the Scotch Education Department. (2) That this condition is out of harmony with the great bulk of professional opinion and with the express wishes of the parents of Scotland, and is a retrograde step prejudicial to the study of modern languages, and therefore to the interests of the nation.

AN interesting discussion on the teaching of Mathematics in Schools took place at the last meeting of the Edinburgh Mathematical Society. Dr. Carslaw, of Glasgow University, criticised

at considerable length the various alterations and improvements suggested by Professor Perry and other speakers. Dr. Carslaw maintained that the main objections urged by Professor Perry did not apply to the teaching of mathematics in Scottish schools. He admitted, however, that so long as examinations maintained their dominating influence in education, no general reform in methods of teaching could be looked for till the desired changes had obtained the approval of the leading examining bodies. A representative committee was appointed to draw up the outlines of an improved scheme for Elementary Mathematics, and to submit the same to the next meeting of the Society. Whatever be the final outcome of the suggestions of Prof. Perry, the stirring up of the dry bones which they have occasioned from Land's End to John o' Groat's cannot fail to be productive of lasting and beneficial effect upon the teaching of the subject.

THE new regulations for the training of teachers have come in for a good deal of criticism, not always very well informed. It has been asserted that the effect of the circular will be to set up two distinct grades of teachers—the university trained and the non-university trained. But it is forgotten that these two grades have existed in the profession for the past twenty years. The Department have only accepted a classification which they saw no prospect of removing, and have endeavoured, with considerable success, to set up for each class conditions of work better suited to their respective circumstances and needs. The only real ground for criticism is that the new regulations are made effective at once; and considerable hardship is thereby occasioned to the large class of students who have not been afforded an opportunity of preparing themselves for the new conditions. Notwithstanding this drawback, it is very satisfactory to find that fully 75 per cent. of the Scottish teachers in training are classed as university students. In the near future it may be possible, so far as male teachers are concerned, to obtain all the supply from the ranks of the university students.

ADVOCATES of drawing in secondary schools will be pleased to learn that this subject is for the future to be an integral part of the Leaving Certificate Examination, and a pass in the subject will count as a lower grade in the new group Leaving Certificate. Applications for sitting at the examination will only be entertained where the Department is satisfied that the conditions in regard to the equipment of the school and the qualifications of the staff are adapted for the effective teaching of the subject. Candidates must be 15 years of age on or before October 15th succeeding the examination, and must have been under instruction two hours per week during a period of three years. The examination will be held at the respective schools, by the Inspectors of the Department, or by persons officially appointed. All drawings and exercise books of the candidates are to be preserved for submission to the examiners, who may in addition set such tests, relative to the approved course of instruction, as they may think expedient. The institution of the certificate will be very generally approved, as the pressure of examination subjects was tending to crush Drawing out of the secondary schools.

IRISH.

THE Catholic Headmasters' Association has forwarded a Memorial to the Intermediate Board, making suggestions under three headings. The first deals with Examiners and Inspectors, urging that the former should be experienced teachers, and that the standard of the examination papers, both pass and honour, should be carefully arranged, and asking several important questions about the latter,—what will be their nationality, the scope

of their work, will there be any appeal from them, &c. ? The second heading deals with science and art teaching, complaining of the inadequacy of the grants, asking for a limitation of the school year for science and art to thirty weeks, requesting the Department to prevent technical institutes from interfering with the work of secondary schools, and condemning the tendency to introduce mixed education. Under the third heading various criticisms are offered on the Intermediate Programme, similar to those forwarded by other associations.

A MEMORIAL has also been forwarded by the Association of Irish Schoolmistresses in many respects similar to those of the Teachers' Guild and the Schoolmasters' Association. The following points, however, are characteristic. The Board are requested to send to each headmistress a copy of the Inspectors' report of her school. A suggestion is made that history should constitute a separate subject. The difficulties are pointed out under which small country schools labour in endeavouring to use the Intermediate system, especially in meeting the requirements of science teaching. And lastly, it is suggested that the junior classes of intermediate schools should be inspected and their efficiency taken into account in awarding grants.

It will be noticed that both these memorials refer to inspection. The present inspectors, the first under the Intermediate Board, are only temporarily appointed. They have not given universal satisfaction, but it is at present impossible to offer adequate criticism, because the instructions given to the inspectors have not been published, and the policy of the Board is not known in sufficient detail.

THE Board have taken a new departure as regards examiners. They have appointed eight senior examiners, one for each subject or group of subjects, and in doing so have given the Gaelic League a grievance. The examiner appointed for Irish is the famous Celtic scholar, Dr. Kuno Meyer, who was a short time ago lecturing in Dublin in support of the Irish movement. His offence on the present occasion is that he is not an Irishman. There can, however, be no doubt that the Board are in the right. Irish, wrongly or rightly, this year takes equal rank as a pass and honour subject with other ancient and modern languages, and it is in the interest, both of education and of the language itself, that a proper standard of examination should be set in it. In previous years, when it was not so favoured a subject, the papers in it were easy and the marks high.

THE King's County, which in January refused to vote any grant for technical education, has rescinded its resolution by a majority of 12 to 10, so that the work begun last year will not be interrupted. We understand that, even if the County Council had not changed its mind, the Department would have continued the work.

AT the inaugural meeting of the Rathmines School of Commerce, held in the Rathmines Town Hall, Mr. Horace Plunkett asked a question which he said he was unable to answer, viz., What is Commercial Education? Mr. Oldham, the head of the School, at the end of the meeting exhibited some lantern slides of schools of commerce on the Continent, and of classes within those schools, but did little towards enlightening the ratepayers present on Mr. Plunkett's question. He did indeed insist that the longer boys and girls stayed at secondary schools the more likely were they to do well when they came to the Rathmines School of Commerce, but the only teaching he spoke of was shorthand, typewriting, make-believe banking and issuing of railway tickets, in addition to the learning of foreign languages. This is not education, but merely

instruction. Commercial education implies a training in the knowledge of the laws underlying commerce, in other words, of the principles, or may we say the science, of business.

THE Association of Intermediate and University Teachers has issued an appeal for continued support. The first general meeting of the Leinster Branch was held at the Royal University on March 1st, when the following resolutions were passed: (1) That only those who have practical knowledge of the working of Irish schools be appointed as inspectors, and (2) that increased facilities for the training of science teachers be granted. The Association reminds teachers of the useful work it has performed among assistant-masters and others, especially on the important question of registration.

WELSH.

THE new Principal of the University College of South Wales and Monmouthshire has hit upon a novel idea—at any rate, in Wales. He has announced his intention to try to get 250 persons to give a sovereign a-piece for three years, and with the £250 a year to try an experiment. He would propose to appoint a man at a liberal salary to go to the manufacturers, the shippers, the traders, the employers of labour, and ask them to fill up any vacancies on their staff by taking the men whom the College should recommend. The College would undertake to give honest reports on the men leaving them, and no man would be recommended unless they had full confidence in his efficiency and qualifications. Principal Griffiths thinks that if the experiment be tried for three years it will be for the advantage of the people of Cardiff and will materially help forward the cause of education. But he does not explain whether the College purposes to continue its present curricula, or to modify them so as to suit the merchants and manufacturers for their more immediate and technical purposes.

EDUCATIONAL Conferences are becoming the order of the day in Wales. One was recently held at Blaenau Festiniog to consider the steps to be taken to carry out the idea of establishing a Mining Department in the University College of North Wales, Bangor. The difficulty occurs that Merionethshire and Festiniog have allocated the whole of their technical rate. Principal Reichel, of Bangor, wrote to the Conference to say: "Your Conference should clearly understand that the success of the whole movement is at stake. It is practically certain that the maintenance must be provided from the technical rate or not at all." The enthusiasm of Festiniog, however, for education runs high. One speaker said, "Festiniog and Merioneth would be ready to the call when the time came." This, at any rate, is the spirit which characterises the leaders of the Welsh counties in what has lately been called the Welsh Educational Renaissance.

BARRY DOCK is one of the most progressive towns in South Wales in elementary education, quite a parallel to Blaenau Festiniog in North Wales. Certainly the citizens of Barry have something to be proud of in the handsome town-schools. The Holton Road Schools at Barry are most attractive and conspicuous buildings. But on a recent Sunday they suffered a shameless outrage. The following description is given in a local paper. The whole buildings were ransacked, not a room escaping vandalism. Every teacher's desk was broken into. Kindergarten materials were strewn about the floor. The glass of the museum was broken, and contents of the museum strewn on the floor. The cupboards were ransacked. The whole school was in a state of disorder and ruin. In addition, fire was set to the building. Extensive damage was done.

THE Executive Committee of the Welsh County Schools Association have unanimously adopted the following resolutions : (1) That in Wales and Monmouthshire the representation of the County Governing Bodies should be so modified as to render them the local authorities responsible for primary and secondary (including technical) education. (2) That there should be an upper age limit in the case of primary schools, as there is in all schemes dealing with secondary schools, with a view to prevent undue overlapping. (3) That local authorities should have the power of adopting or adding to their number in a fixed and definite proportion persons possessing adequate knowledge and experience of the work of teaching in primary and secondary schools. (4) That it is undesirable that there should be a statutory limit to the rate raised by the county councils and borough councils for purposes of secondary and technical education.

THE Court of the University of Wales has decided that the installation of His Royal Highness the Prince of Wales as Chancellor shall be held in North Wales, at Carnarvon and Bangor. The details of the ceremony are not yet completed, but it is generally expected that the installation itself will take place in Carnarvon Castle. If this is so, there can be no doubt that there will be a most picturesque and imposing function, one which appeals to the imagination of Welshmen, far beyond the limits of academic circles. We trust that in the invitations to be present there will be a large and generous inclusion of those concerned with the elementary and the intermediate education of the country. Nor, if there is room, would it be unfitting to consider bringing together the captains of the intermediate schools—to represent Wales that is to be.

THERE can be little doubt that the Welsh language should be used in teaching in the Infants' classes in Welsh-speaking districts, but it would scarcely be wise to attempt to require Welsh to be taught universally in all the elementary and intermediate schools of Wales. There is a strong case for the principle of local option. At Merthyr Tydfil, the question has been under consideration. The School Board there received a report from the School Management Committee, who submitted the question to the head teachers of their schools. Apparently there was not a referendum to the parents, presumably because it might be assumed the Merthyr parents would wish Welsh to be taught. After the replies from the head-teachers, the School Management Committee recommended that Welsh be taught, that the direct method of teaching should be used, that pictorial lesson cards be adopted in all standards; that after the end of the present school year Welsh reading-books be used in all the classes; that two hours each week should be devoted to the teaching of the subject. These recommendations were adopted, and it was agreed that a sub-committee should draw up a circular giving further instructions to the teachers.

CURRENT HISTORY.

IT is a commonplace of history that in the vigorous days of the Roman Empire the strength of that Empire lay in its extremities. While the city lay in absolute security at the centre, her Emperors were ubiquitous with their armies defending the immense circumference against Teutonic, African or Parthian enemies. And the result was that Rome at last became, as it were, a provincial city of the Empire to which she had given her name and her laws. All the great cities of modern Europe began by being frontier fortresses. Paris against the Normans, Vienna against the Magyars, Berlin against the Wendas, Frederick of Prussia left Berlin every war-time, and even allowed it to be ravaged, because the Prussian State was where he was

with his armies in Silesia, in Bohemia, in Hanover. The Dutch in their distresses sometimes thought of drowning Holland and Zealand and sailing away to some new conquest of the ocean. Their great revolt began with a fleet of "Sea Beggars." So too with the British Empire. Its colonies are growing, and the Crown is showing a true wisdom in leaving home politics to the Conservatives and the various Liberal parties and cultivating the Empire. Just as James I. wanted to be King of Great Britain, not of England and Scotland, so Edward is King of all the Britains, Sovereign Lord of the Britains beyond the Seas, and those rising communities are loyaller to him than they are to the Brito-Irish Parliament. Herein is a "grain of mustard seed."

WHAT a shallow view that is which is generally taken of the functions of the various institutions which together make up our Brito-Irish constitution. Ever since Montesquieu wrote his "Esprit des Lois," we have taken his misrepresentation of our Parliament as gospel-truth. Nay, his theory was so powerful that it made itself true—like a prophecy which helps to fulfil itself—in the U.S.A., where the executive and the legislative are carefully kept apart. And since the Industrial Revolution of the 18th century, and the successive constitutional revolutions which we call Reform Bills of the 19th, our Parliament has been so busy making ever new laws—and we might add, repealing them as well—that we have come to believe that the Cabinet is the Executive and governs, while Parliament is the legislative and legislates; the two functions being mutually exclusive. But when the House of Commons discusses changes in the constitution as it has been doing this session, we find it quite otherwise. Members resisting the new rules of procedure say among other things: "The House is the Grand Inquest of the Nation, and not a mere factory of statutes; it is falling into contempt because it is coming to be regarded as a mere machine for registering the decrees of the Cabinet. The effect of the new rules would be to reintroduce the state of things that had existed in Tudor times, when members were told that their only privilege was to vote. The function of the House of Commons is to discuss great subjects adequately. The new scheme might put obstacles in the way of effective criticism of the Executive."

"THE Premier of Queensland regrets the actions of the Commonwealth Government and says they have bitterly disappointed the strongest advocates of the Union." "The Premier of New South Wales protests against the Premiers of Australian States being placed, as regards the Coronation, in a position inferior to that of the Premiers of New Zealand and other self-governing Colonies." The British Empire is being "Americanised." In other words, the Constitution of the Empire is being assimilated to that of the United States of North America. We are federating, sometimes by separation as in Canada, sometimes by union as in Australia. It would be interesting and instructive to make a plan, like the familiar genealogical tree, representing the construction of this wonderful Empire. Meanwhile we watch the working of our newest experience in constitution making. Did the makers of the Australian Commonwealth study the history of the American Constitution? If so, how did they miss seeing that the individual States lost "freedom" by making a strong central government? "Freedom, it was then declared, would perish." And so it did, in a certain degree. What power was given to the U.S.A. was lost, and must in the nature of things have been lost to the individual states that gave it. You cannot eat your cake and have it!

"PARLIAMENT consists of the King, the House of Lords and the House of Commons. Of these, the House of Commons is the representative House." So we learn and teach with that incompleteness which makes our history lessons as unsatisfactory

as chaff, because our statements lack touch with things as they are. "Representative" of what? And because the Brito-Irish constitution is a "growth," not an artificial product of doctrinaires, because it resembles the poet—"nascitur non fit"—or Topsy who "never had no father nor mother," but simply "grewed," we do not know what our House of Commons does represent, except, in some vague way, the "people." We speak of Parliament as "the three Estates," but our text-books are not clear as to what the Estates are, and tell us nothing of why there are three. And therefore we can have such discussions in the House as happened in January last, when Mr. Balfour said that members represented constituencies, not nationalities, and Mr. Asquith supported him in that contention. Does the House represent "estates," *i.e.*, classes of the community, or does it represent "places," and are the Acts of Union, those respectively with Scotland, and with Ireland, dead letters, and is our country now *really* a "United" Kingdom which can ignore national distinctions? These are the questions which press for a solution if we are to solve the political questions of the day with some approach to sanity.

COLLEGE OF PRECEPTORS' EXAMINATION: SECOND CLASS (JUNIOR),
JUNE, 1902.

Revision Test Papers.

English Grammar.

A.—SPELLING, COMPOSITION, &c.

(1) Write out in full, in a single column, the words imperfectly given in the following:—

Never since lit-t-re became a calling in England had it been a less pro-table calling than at the time when Johnson took up his residen-e in London. In the pre-d-ng generation, a writer of e-in-nt merit was sure to be munif-ntly rewarded by the gov-m-nt. The least that he could expect was a pen-ion or a sin-cure place; and, if he showed any aptit-e for polit-ics, he might hope to be a member of parl-m-nt, a lord of the tre-s-y, an amb-s-d-r, a secr-t-ry of state. It would be easy, on the other hand, to name sev-r-l writers of this cent-y of whom the least suc-s-ful has rec-ved fo-ty thousand pounds from the book-sellers.

(2) Write a short essay, of not more than two pages, on one of the following subjects:

(i.) Wireless telegraphy; (ii.) Flying machines; (iii.) The King's coronation.

(3) Paraphrase:—

This is the state of man; to-day he puts forth
The tender leaves of hope; to-morrow blossoms,
And bears his blushing honours thick upon him:
The third day comes a frost, a killing frost,
And when he thinks, good easy man, full surely
His greatness is a-ripening, nips his root,
And then he falls.

B.—GRAMMAR.

(1) Give examples to prove that the same vowel sound is not always represented by the same symbol. In what other ways is our alphabet an unsatisfactory one?

(2) Explain the uses of relative pronouns. Give the cases of all the relative pronouns in the following sentences, and account for them:—

(i.) This is the man who did it; (ii.) I know the book that you want; (iii.) Fetch the boy whose book was torn.

(3) Parse fully:—

I am monarch of all I survey,
My right there is none to dispute.

(4) Analyse:—

In this poor gown my dear lord found me first,
And loved me serving in my father's hall:

And this poor gown I will not cast aside
Until himself arise a living man
And bid me cast it.

(5) What parts of speech may adverbs modify?

Parse fully the words *alone*, *almost*, in each of the following sentences:—

(i.) He almost succeeded alone; (ii.) He succeeded almost alone; (iii.) He, alone, almost succeeded.

(6) Draw up a scheme of tenses of the indicative mood of the verb *to write*.

(7) What are the rules for the comparison of adjectives? What classes of adjectives do not admit of comparison?

English History, 1066-1603.

(1) In what ways did Henry II. strive to put an end to the evils of the Anarchy and to prevent their recurrence?

(2) Enumerate the principal occasions, during your period, on which a minor either succeeded to, or was excluded from, the English throne.

(3) Trace carefully *either* (a) the dealings of Henry I. with Normandy, *or* (b) the dealings of Edward I. with Scotland, *or* (c) the dealings of Mary I. with Spain.

(4) Name two prominent ecclesiastics in each of the five centuries of your period, and give an extended account of *any one* of those whom you name.

(5) Write a short connected account of *either* (a) the Wars of the Roses, *or* (b) the struggle between England and Spain in the time of Queen Elizabeth.

(6) Name a dozen places which were the scenes of notable battles in England during this period (excluding those between 1455 and 1485); and briefly describe the position of the places and the importance of the battles which took place there.

(7) What were the chief faults found with Henry III. and Richard II.?

(8) Distinguish, in both occasion and provisions, between the several *Acts of Uniformity* and *Acts of Supremacy* which were passed during the sixteenth century.

Geography.

(N. B.—All candidates must take Section A, together with ONE of the sections B, C, D.)

A.—GENERAL.

(Answer not more than three questions in this section.)

(1) Describe the course of the "continental axis" of Europe and Asia with reference to the various oceans and seas.

(2) Assuming that you are being examined in London, place a small dot in the centre of a sheet of paper to represent the position of that city; then draw lines indicating the direction and the relative distances between London and the following places:—New York, Calcutta, Melbourne, Archangel, Rome, Madrid, Cape Town.

(3) Explain and give instances of:—desert, distributary, watershed, isthmus, glacier, steppe.

(4) Mention the British possessions in Africa, and write a short note explaining the importance of each.

B.—SCOTLAND, GERMANY, AND AUSTRALASIA.

(Question 5 is obligatory; not more than THREE others may be attempted.)

(5) Make a sketch map of Germany showing the courses of the chief rivers with the watersheds between them. Indicate the districts where the population is densest. Mark the chief Baltic ports, the boundary between Germany and Russia, and that between Germany and France.

(6) Germany has 250, Scotland 150, Australia less than two people per square mile. Account for these differences.

(7) Account for the difference between the climate of New Zealand and that of New Guinea.

(8) To what is the importance of the following towns due:—Berlin, Glasgow, Sydney, Munich, Edinburgh?

(9) What are the chief wool-producing regions of Australia? Compare Germany and Australia with regard to this industry.

(10) What do you know of:—Carse o' Gowrie, Great Barrier Reef, Black Forest, Trossachs, Kaiser Wilhelm Canal?

C.—SCOTLAND, AMERICA SOUTH OF MEXICO, AND AUSTRALASIA.

(Question 5 is obligatory; not more than THREE others may be attempted.)

(5) Make a sketch map of Scotland showing the distribution of the highlands and lowlands. Indicate the districts where the population is densest. Mark the positions of the following:—Greenock, Stonehaven, Oban, Stornoway, Stirling, and trace the course of the Tay.

(6) Explain why the chief source of Australia's wealth is sheep. What originally caused the immigration of Europeans to that continent?

(7) What advantages would result from the cutting of a canal across the isthmus between North and South America? What rival schemes have been put forward, and what are the chief difficulties to be encountered?

(8) What do you know of Maoris, Aztecs, Incas, Papuans, crofters, peons?

(9) To what is the importance of the following towns due:—Aberdeen, Melbourne, Buenos Aires, Vera Cruz, Glasgow?

(10) Name the chief products of Brazil, Venezuela, Argentina, Mexico, and connect them with the conditions of climate and structure that obtain in each country.

D.—PHYSIOGRAPHY.

(Question 5 is obligatory; not more than THREE others may be attempted.)

(5) On an outline map of the world show and name:—

(a) The countries and seas through which the Equator passes; (b) The course of any warm ocean current; (c) The chief deserts; (d) The regions where most rain falls; (e) "Grass lands," i.e., prairies, llanos, &c.

(6) Explain in three different ways how to draw a north and south line.

(7) Describe how you would make a thermometer and explain its uses.

(8) What do you understand by the following terms:—Midnight sun, lagoon, solstice, watershed, bore, irrigation canal, aurora borealis?

(9) Give a brief explanation of the monsoons.

(10) What is meant by the life-history of a river?

Arithmetic.

(1) A consignment of flour consists of 789 sacks, each sack weighing 1 cwt. 3 qrs. 10 lbs. 8 ozs. What is the total weight of the whole consignment?

(2) A chain contains a hundred links and measures 22 yards. How many square inches are there in a square link?

(3) Simplify

$$1 \div \frac{1\frac{2}{3} \times 4\frac{5}{7} \div 2\frac{2}{3}}{3\frac{1}{2} + 4\frac{4}{7}} \div \frac{2\frac{1}{2} \div 1\frac{2}{3}}{3\frac{1}{2} + 2\frac{1}{2}} \times \frac{1}{1 - \frac{2}{3} \div 1\frac{1}{2}}$$

(4) Find, by Practice, the value of 7,234 ounces of standard gold at £3 17s. 10d. an ounce.

(5) Express 2.3 of 18s. 4d. + .1013 of £3 2s. 6d. + 4.876 of £1 os. 9d. as a decimal of five guineas.

(6) If it takes 18.5 metres of silk to make a dress, and the silk is 3 fr. 25 c. per metre, what will be the price of the silk for the dress in English money to the nearest penny (£1 = 25.22 francs).

(7) A cubic foot of water weighs 1,000 ozs. A metre is equal to 39.37 inches. Find the weight to the nearest ounce of the water which a rectangular vessel can contain whose inside measurements are 12 decimetres × 24 decimetres × 6 decimetres.

(8) A square field contains 24½ acres; find the length of one of its sides to the nearest yard.

(9) What is the simple interest on £385 at 3½ per cent. from 28th March, 1901, to 9th June, 1903?

(10) A, B and C are in partnership in business. At the beginning of the year each has £600 in the business. At the half-year A adds another £200 and B adds £300, but at the end of eight months C withdraws £400 of his capital. If A gets £140 from the year's profits, what do B and C get?

(11) A room measures 18 ft. 6 in. by 14 ft. 9 in. A border, 1 ft. in width, running round the room, is covered with felt at 1s. 6d. per square yard, and the rest of the room with 27-inch

Axminster carpet at 4s. 6d. a yard. Find the total cost of covering the floor.

(12) A train arrives 10 minutes late after doing a journey at 24 miles an hour, but if it went at 30 miles an hour it would be a minute early. What is the length of the journey?

Answers:—(1) 72 tons 14 cwt. 2 qrs. 24 lbs. 8 ozs. (2) 62.7264. (3) 2½. (4) £28,152 6s. 4d. (5) 1.428571. (6) £2 7s. 8d. (7) 61,023 ozs. (8) 344 yards. (9) £16 3s. 4 8d. (10) B gets £150 and C £93 6s. 8d. (11) £7 6s. 5d. (12) 22 miles.

Algebra.

(1) Prove that, when $a = 2\frac{1}{2}$, $b = -3$, and $c = \frac{1}{2}$, the following relation between the three quantities a , b and c , &c., holds good, viz. : $a^2 + b^2 + c^2 = 3abc$.

Prove that it also holds good when $a + b + c = 0$.

(2) Show that $a(b+c) = ab+ac$.

Find the value of $[a - \{b - c - (a - b)\}] [c - \{a - b - (c - a)\}]$.

(3) Resolve into their simplest factors the following expressions:—

(i.) $a^3 - 2ab^2 + b^3 - 2a^2b$; (ii.) $x^3 - x^2y - 240xy^2$;

(iii.) $x^3 - 16x^2y^3 + 64y^6$.

(4) What expression must be subtracted from the fourth power of $x + 2y$ to render it exactly divisible by the cube of $x - y$?

(5) Find the square root of:—

$$4x^2(27y^2 + 4x^2) - 12xy(9y^2 + 4x^2) + 81y^4.$$

(6) Solve the equations:—

(i.) $\frac{x-3}{5} - \frac{4-x}{7} = \frac{2x-3}{14} - \frac{1}{70}$.

(ii.) $14 - 2x = 4 - 3y = 10(x + y + 1)$.

(7) Simplify:—

(i.) $\frac{x-4}{x^2-5x+6} - \frac{2x-1}{x^2-x-2} + \frac{1-x}{x^2-2x-3}$.

(ii.) $\frac{x^4 + 3x^3 - 7x^2 - 21x - 36}{x^4 + 2x^3 - 10x^2 - 11x - 12}$.

(8) (a) A room measures x yards in length and y feet in breadth. Express its floor area in square inches.

(b) How many miles an hour does a cyclist go who travels m times as fast as a pedestrian who takes p minutes to walk from one town to another q leagues away?

(c) A market-woman bought k eggs at l pence a dozen, and n times as many at r shillings a score. She sold them for s pounds and made l pence profit. Find n in terms of k , l , r , s and l .

(9) Ten years ago a man was three times as old as his son, and in twenty years time the father will be half as old again as the son. Find their present ages.

(10) A number of two digits is reduced by 9 when the digits are interchanged. The sum of the digits is also 9. Find the number.

(11) Solve $x^2 - 5x + 6 = 0$ by means of resolving the left-hand side of the equation into factors, and state fully the reasons for the deductions made.

Solve:—

$$\frac{2}{x-1} - \frac{3}{x+2} = 1\frac{1}{2}.$$

Answers:—

(2) $2c^2 - 2b^2 - 4a^2 + 6ab + 2ac - 3bc$.

(3) (i.) $(a+b)(a^2 - 3ab + b^2)$; (ii.) $x(x-16y)(x+15y)$;

(iii.) $(x-2y)^2(x^2 + 2xy + 4y^2)^2$. (4) $27y^2(2x^2 + y^2)$.

(5) $4x^2 - 6xy + 9y^2$. (6) (i.) $4\frac{2}{3}$; (ii.) $x=2, y=-2$.

(7) (i.) $\frac{-2x^2 + 7x - 9}{(x+1)(x-2)(x-3)}$; (ii.) $\frac{x^2 + 2x + 3}{x^2 + x + 1}$.

(8) (a) $432xy$; (b) $\frac{180mq}{p}$; (c) $\frac{5}{36kr} (2880s - 12l - kl)$.

(9) 40; 20. (10) 54. (11) (i.) $x=3$ or 2 ; (ii.) 2 or $-\frac{19}{5}$.

Euclid.

A.—BOOK I.

(1) Define a line, a straight line, a circle, a square, and a parallelogram.

(2) Name the four cases in which Euclid proves that two triangles are equal in all respects. Name also, with diagrams, the different kinds of triangles mentioned by Euclid in his definitions.

(3) You are given a terminated straight line PQ. Find its middle point and prove your construction.

(4) In the triangle ABC, if BC is the greatest side, which is the greatest angle? Prove that your answer is right.

If in the above triangle any point D be taken in the base CA, then BD will be less than BC.

(5) Prove that the sum of the three angles of any triangle is equal to two right angles.

Four angles of an equiangular polygon are together equal to seven right angles; how many sides has the polygon?

(6) Describe a rectangle equal to a given irregular pentagon.

A point P moves so that the difference of the squares of its distances from fixed points A and B is always equal to the square on AB. Prove that P is always on a fixed straight line.

Either B.—BOOK II.

(7) If a straight line be bisected and produced to any point, the rectangle contained by the whole line thus produced and the part of it produced, together with the square on half the line bisected, is equal to the square on the straight line which is made up of the half and the part produced.

(8) Find a point Q in the straight line PR such that the area of the square whose side is PQ shall be equal to the area of the rectangle whose two equal pairs of sides are equal to PR and QR respectively.

Prove that the square on the line PR with the square on line QR would be equal to three times the square on PQ.

Or C.—BOOK III., 1-19.

(7) Prove that two circles which cut one another cannot both have the same point as centre.

(8) Draw two tangents to a circle from an external point and prove they are both equal.

French.

I. Translate into English :—

WINTER IN SWEDEN.

Le long des côtes, le sol est sec et durci, l'hiver est tempéré par le voisinage de la mer; mais quand on arrive dans l'intérieur du pays, on n'aperçoit plus que les lacs couverts de glace, les grandes plaines chargées de neige; de distance en distance quelques tiges solitaires de bouleaux (*birch-trees*), qui penchent vers le sol leurs branches, et les forêts de sapins qui entourent de leur ceinture noire les campagnes toutes blanches. L'air est d'une pureté sans égale, mais le ciel est sombre. Le soleil laisse à peine entrevoir vers midi quelques rayons fugitifs. Le jour commence à neuf heures et finit à trois; un nuage épais pèse sur la terre comme une masse de plomb, et quand parfois la lune pâle brille à travers ce nuage, elle apparaît comme une lampe d'albâtre.—XAVIER MARMIER.

II.

(1) Write out in full the future and present subjunctive of: *finir, rompre, aller, venir* and *pouvoir*.

(2) Translate: (a) Napoleon died on the fifth of May, eighteen hundred and twenty-one. (b) Which of these pens is yours? (c) He is a workman. (d) I shall want some more money. (e) He has broken his leg.

(3) How are adverbs formed in French? Translate: cruelly, prudently, slowly, quickly, politely.

(4) Give the masculine and feminine of: traitor, traveller, fisher, director, governor, widower, twin, new, hero, liar.

(5) Give a list of the relative pronouns in French, and decline them.

III. Translate into French :—

Life in Sweden is very primitive. You pass out from the gate of the city, and the scene changes to a wild wood. Around you are forests of fir. The air is warm; on a wooden bridge you cross a little stream. Across the road are gates, which are opened by troops of children. The peasants take off their hats as you pass. The houses in the villages are built of wood, and painted red. In many villages there are no inns, and the peasants receive travellers. The wife feeds you well, and the husband lends you his horses for your carriage.—LONGFELLOW.

COLLEGE OF PRECEPTORS' EXAMINATION: THIRD CLASS, JUNE, 1902.

Revision Test Papers.

English Grammar.

(Study the following passage before answering Questions 1, 2, 3, 4.)

If you have tears, prepare to shed them now.

You all do know this mantle. I remember

The first time ever Cæsar put it on;

'Twas on a summer's evening, in his tent;

That day he overcame the Nervii.

Look! in this place ran Cassius' dagger through:

See, what a rent the envious Casca made.

(1) Give in your own words the meaning of the passage.

(2) Parse fully :—

Look! in this place ran Cassius' dagger through.

(3) Write down the subjects, and, where possible, the direct objects, of the following verbs :—*have, prepare, know, remember, put, was, ran, made*.

(4) Make a list of all the adverbs in the passage, and say to what words they belong.

(5) *That* and *round* are two words that belong to more parts of speech than one. Make sentences in explanation of this statement.

(6) Substitute pronouns for the nouns italicised in the following passage :—*John* (the person speaking) was driving this morning, when *John* noticed *James* (the person addressed) with a lady and a gentleman. Was the *gentleman James's* uncle, and was the *lady the gentleman's* wife? *John* would be glad if *James* would tell *John* whether *the lady and the gentleman* are staying at *James's* house, and whether the *lady* is younger than the *gentleman*.

(7) Give the actual words of the person whose speech was reported as follows :—

He said that he had hoped to give them a more encouraging report of the progress of the war, but, as they doubtless knew, he had received news from the front which had compelled him to take a somewhat gloomy view of the present position. They must, however, remember that he was personally inclined to look on the darker side of things. Let them rest assured that nothing on his part should be lacking to ensure their ultimate success.

(8) Write, with proper capitals, stops, inverted commas, &c. :—dead exclaimed the duke dead repeated the lawyer sharply and how many children has he left inquired the duke he died unmarried then i you are the lawful heir.

English History, 1066-1603.

(1) What did William the Conqueror do towards making England a strong and orderly kingdom? Mention not more than six notable persons who lived during his English reign.

(2) Arrange the following ten persons in the order in which they lived :—Anselm, Drake, Caxton, Cromwell, Gaveston, Montfort, Thomas of Canterbury, Warbeck, Wolsey, Wycliff. Mention in what reign each lived, and add a short biography of *any one* of them.

(3) Write an account of the Great Pestilence, commonly called the Black Death.

(4) How did Henry II. become involved in fighting in Ireland, Edward I. in Wales, Edward III. in France, Henry VIII. with Scotland, and Elizabeth with Spain?

(5) Name half-a-dozen naval battles in which the English took part during your period, choosing not more than two from the sixteenth century.

(6) Tell the story of *any one* of the following episodes :—(a) The Coming of the Friars, (b) The Third Crusade, (c) The Introduction of Printing, (d) The English Share in the Discovery of America, (e) The Pilgrimage of Grace.

(7) Draw or describe any two of the following persons :—A Crusader, a Monk or Friar (state what kind), A Knight in Armour (state period), A Cardinal.

Geography.

(Marks will not be given for more than SIX questions, of which the first must be one.)

(1) On an outline map of Southern England draw the course of the Thames; show the position of the Isle of Wight, Sheppey, the Goodwin Sands, Eddystone Lighthouse, and the following towns:—Plymouth, Canterbury, Southampton, Oxford, Taunton.

(2) What is meant (a) by the source, (b) by the mouth of a river?

Give the source and the mouth of each of these rivers:—Tyne, Danube, Shannon, Trent.

(3) What countries contain many lakes? Name two in each. Why are there generally lakes where there are mountains?

(4) What are the following places noted for:—Birmingham, Southampton, Belfast, Manchester, Nottingham, Liverpool?

(5) Why are there fewer people in Wales than in England?

(6) Why is wool made in Yorkshire, pottery in Staffordshire, silk in Derbyshire? In what parts of England is most wheat grown? Why?

(7) Explain:—archipelago, promontory, embankment, equator, delta, canal.

(8) Where and what are the following:—Dogger Bank, Zuyder Zee, Crimea, the Landes, Hecla, St. Gothard Tunnel?

Arithmetic.

(1) What number must be added to four thousand and three times twenty thousand and fifty to make one hundred millions? Write the answer in words.

(2) How many halfpennies are there in £70,181 10s. 3½d.? Taking the width of a halfpenny as one inch, how far would this number of halfpennies stretch if placed in a straight line so that each coin touched those next to it?

(3) Butter costs £135 6s. 8d. per ton. What does a pound cost?

(4) Multiply 3 acres 2 roods 21 square poles by 297.

(5) A man finds he has walked 16 miles in 5 hours; if he keeps walking at the same pace, how much longer will he take to finish his journey of 21 miles?

(6) Reduce the following fractions to their lowest terms:— $\frac{110}{120}$, $\frac{128}{144}$, $\frac{792}{1080}$ and $\frac{147}{156}$.

(7) Find the value of:—(a) $1\frac{1}{2} + 2\frac{1}{3} + 3\frac{1}{4} + 4\frac{1}{5} - 6\frac{1}{6}$.
(b) $\frac{1}{11} + \frac{1}{13} - \frac{1}{14} + \frac{1}{15} + \frac{1}{16}$.

(8) Simplify:— $\frac{\frac{3}{10} + \frac{1}{5} \text{ of } \frac{7}{16} + \frac{1}{18}}{(\frac{2}{5} + \frac{1}{3}) \text{ of } \frac{7}{15} + \frac{1}{18}}$.

(9) What is the use of the decimal point in arithmetic? Explain how you would divide a number by 1000 by simply moving the decimal point?

(10) Add together 1'3274, 2'37, 4'845, and divide the result by 4'56, correct to two decimal places.

(11) A train goes 17 miles in 28 minutes. What is its speed in miles per hour?

(12) Find, by Practice, the value of 2 tons 7 cwt. 3 qrs. of coal at 23s. 4d. per ton.

Answers.
(1) Nineteen millions, seven hundred and thirty-nine thousand, eight hundred and fifty. (2) 33,687,127; 531 miles; fur. 16 p. 5 yds. 1 ft. 7 in. (3) 1s. 2½d. (4) 1078 acres 1 r. 37 sq. poles. (5) 1 hour 33½ minutes. (6) $\frac{1}{2}$, $\frac{1}{30}$, $\frac{5}{6}$, $\frac{1}{2}$. (7) (a) $4\frac{1}{2}$; (b) $\frac{1}{15}$. (8) 1½. (10) 8'5424; 1'88. (11) 36½ miles per hour. (12) £2 15s. 8½d.

Algebra.

(1) Find the value of the following expressions when $a = 1$, $b = -2$, and $c = 0$.

(i.) $a + 2b - 3c$; (ii.) $(a - b) - (b - c)$; (iii.) $ab + bc + ca$.

(2) Reduce to its simplest form:— $a(b - c + 2d) - b(c - d + 2a) + c(d - a + 2b) - d(a - b + 2c)$.

What is the value of this expression when $a = 1$, $b = 2$, $c = -2$, and $d = -1$.

(3) Multiply:—(i.) $2p - q$ by $2q + p$.
(ii.) $2x^2 + 3xy + 4y^2$ by $3x^2 - 4xy + y^2$.

(4) Add twice the sum of $3a + 2b$ and $2a - 3b$ to three times their difference.

(5) Divide:—(i.) $27a^2b^2m^3$ by $3a^2m^2$.
(ii.) $16x^4 + 36x^2y^2 + 81y^4$ by $4x^2 + 6xy + 9y^2$.

(6) Solve the equations:—

(i.) $2x + 3 = 3(x - 1) - 4(x - 2) + 1$.

(ii.) $\frac{x}{2} + \frac{1}{3} = \frac{x - 1}{3} - \frac{x - 2}{4} + 1$.

(iii.) $(5x + 3)(x - 2) = (3x + 4)(2x + 5) - (x - 1)(x + 2)$.

(7) Resolve into factors:—(i.) $4a^2b + 6abc + 12ab^2$.

(ii.) $x^2 + 6ax + 9a^2$.

(iii.) $81^4 - 16m^8$.

(8) Prove that the difference between the squares of two consecutive numbers is always an odd number. What are the consecutive numbers when the differences between the squares is 17?

(9) The property of three persons together is worth £3,300, and one of them is twice as rich as the second and three times as rich as the third. What is the poorest of them worth?

(10) I buy e sheep for f pounds each, c lambs for d shillings a couple, and l pigs for 30 shillings each. How many shillings did I give for the lot?

Answers.

(1) (i.) -3; (ii.) 5; (iii.) -2. (2) $-ab - 2ac + ad + bc + 2bd - cd$; -9. (3) (i.) $2p^2 + 3pq - 2q^2$; (ii.) $6x^2 + x^2y + 2x^2y^2 - 13xy^2 + 4y^4$. (4) $13a + 13b$ or $7a - 17b$. (5) (i.) $9a^2b^2m^2$; (ii.) $4x^2 - 6xy + 9y^2$. (6) (i.) 1; (ii.) 2; (iii.) $-\frac{28}{29}$. (7) (i.) $2ab(a + 3c + 6b)$; (ii.) $(x + 3a)^2$; (iii.) $(3l + 2m^3)(3l - 2m^3)(9l^2 + 4m^4)$.

(8) 8 and 9. (9) £600. (10) $20ef + \frac{cd}{2} + 30l$.

Euclid.

(1) What is an *axiom*? Write out any six of Euclid's axioms.

(2) Define the following expressions with diagrams to illustrate the definitions:—right angle, obtuse angle, circumference of a circle, and hypotenuse of a right-angled triangle.

(3) On each side of a finite straight line PQ describe equilateral triangles PQR and PQS. Prove that the figure PQRS is a rhombus. Write out in full all the postulates which Euclid asks may be granted in order to make the necessary constructions.

(4) Two triangles LMN and XYZ have their sides LM = XY, MN = YZ and the angle LMN = the angle XYZ. Prove that the triangles are equal in area.

(5) Prove that the straight line which bisects the vertical angle of an isosceles triangle also bisects its base.

(6) The side QR of a triangle PQR is produced to S; prove that the angle PRS is greater than the angle PQR.

(7) D, E and F are three towns and G is another town inside the triangle formed by D, E and F. A man walks from D to F. Prove that the road *via* G is shorter than the road *via* E, assuming the roads between the towns to be straight.

(8) If two triangles have two sides of the one equal to two sides of the other, each to each, but the angle contained by the two sides of one of them greater than the angle contained by the two sides equal to them of the other, the base of that which has the greater angle must be greater than the base of the other.

French.

I. Translate into English:—

Il se dirigeait vers la gare, quand, passant devant un admirable pagode, il eut l'idée d'en visiter l'intérieur. Il ignorait deux choses: d'abord que l'entrée de certaines pagodes indoues est formellement interdite aux chrétiens, et ensuite que les croyants eux-mêmes ne peuvent y pénétrer sans avoir laissé leur chaussure à la porte. Il faut remarquer que, par raison de saine politique, le gouvernement anglais, respectant et faisant respecter jusque dans ses plus insignifiants détails la religion du pays, punit sévèrement quiconque en viole les pratiques. Il admirait l'ornementation brahmanique, quand soudain il fut renversé sur les dalles (*flagstones*) sacrées par trois prêtres.—JULES VERNE.

II.

(1) Give the past definite (preterite) tense in full of—*avoir*, *être*, *recevoir*, *punir*, *rendre*.

(2) Give the singular and plural of—the eye, the halfpenny, the pebble; the masculine and feminine of—light, old, young, unhappy; and the comparative of—good, well, little.

(3) Write out the ordinal numbers from 1st to 20th.

(4) Translate: this man, these women, here it is, this is mine, each one, it is six o'clock, my sisters, the third of June, I give it to you, it is warm.

III. Translate into French :—

(1) The steamer arrived on the 20th of October. (2) The train started for Paris at 8 in the evening. (3) He went into a pagoda without taking off his shoes. (4) Three priests immediately attacked him and threw him on the ground. (5) He escaped and arrived at the station in time. (6) Do not give it to me, give it to him.

EXAMINATION PAPERS FOR TEACHER'S DIPLOMA—UNIVERSITY OF LONDON.¹

EXAMINATION IN THE ART, THEORY, AND HISTORY OF TEACHING: 1901.

History of Education.

[Only EIGHT questions should be answered, namely, THREE from each of the Sections A and B, and either TWO from Section C, or TWO from Section D.]

A.

(1) How would you define the position of Locke's *Thoughts in the History of Education*?

With which of his predecessors has he most in common?

(2) Illustrate the influence of Locke's philosophy and of his experience as a teacher, respectively, on his ideas about education.

(3) What are the requisites of an educated gentleman according to Locke? How far is he open to the charge of taking an "utilitarian" view of education?

(4) Critically discuss in the light of later ideas the soundness and the value of Locke's views on the following :—(a) rewards and punishments, (b) getting children to take pleasure in learning, (c) physical exercises.

B.

(1) What light do the *Letters* throw on the connection between Herbart's practical experience as a teacher and his theory of education?

(2) Briefly summarise Herbart's views as set forth in the *Letters* on (a) the need of studying the child as an individual; (b) the education of the imagination and the feelings; (c) a suitable curriculum for young boys; (d) early training in morality.

(3) What are the foundations of the Science of Education according to Herbart? How did his interpretation of the fundamental Sciences affect his theory of Education?

(4) Summarise Herbart's theory of attention and apperception as given in the *Lectures*, and compare this with his earlier treatment of the subject.

C [alternative with D].

(1) Explain the division of educational authority between federation, canton, and commune in the Swiss schools, and compare this with the system of control of schools in Prussia.

(2) Bring out, and give the reason of, the more important differences between the curricula of the several kinds of higher school in Prussia.

(3) What are the chief tendencies observable in the recent developments of the training of teachers in Germany?

D [alternative with C].

(1) Distinguish and compare, in respect of their importance, the sources of influence to which the primary schools of England owe their development.

(2) What is implied in a system of national education? What characteristic tendencies of English national life and thought help to explain the condition of English education during the nineteenth century with reference to such a systematic organisation?

(3) What seem to you to be the more important differences between the development of educational ideas in Germany and in England during the nineteenth century?

RECENT SCHOOL BOOKS AND APPARATUS.

Classics.

Horae Latinae. Studies in Synonyms and Syntax. By the late Robert Ogilvie, M.A., LL.D., H.M. Chief Inspector of Schools for Scotland. Edited by Alexander Sowter, M.A., with a memoir by Joseph Ogilvie, M.A., LL.D. xxiii. + 339 pp. (Longmans.) 12s. 6d. net.—This book consists of a number of articles, arranged alphabetically under significant English words, in which meanings are analysed with subtle discrimination, and a number of quotations are given in full to illustrate them. The articles are much fuller than those of the dictionary; but full as they are, we miss quite a number of Latin authors whose usage would repay examination. In fact, this deals practically with a very few—Cicero, Caesar, Sallust, Livy, and Nepos. We are not to suppose that Dr. Ogilvie intended his book to be a complete handbook to Latin, but had it been more complete it would have been even more interesting. As it is, the scholar will find it a most useful companion to the dictionary, and we imagine there will be few who will not be made the wiser for it. It is a good antibarbarus. Take, for example, the last sentences on ACCURATE:

"Accuratus is used only of what is done *cum cura*; hence we say, not 'doctrina' or 'scientia accurata,' but 'exquisita,' 'singularis,' 'interior,' 'subtilis,' or 'elegans.'

"Similarly we say, 'accurate loqui, disputare, scribere,' but not 'accurate scire' for 'exploratum habere,' nor 'accurate nosse' for 'penitus,' 'plane,' 'recte,' or 'optime,' nor 'accuratius videre' for 'diligentius.'"

Dr. Ogilvie has a gift of exposition which makes him remarkably clear (see, for example, the distinction between *praesertim cum* and *cum praesertim*, pp. 99, 100). So good is he at distinguishing synonyms that we cannot help wishing he had sacrificed some of his syntactical articles and given us more of these. The scholar will find this a delightful book.

Schoolmasters should read Professor Percy Gardner's lecture on *Classical Archaeology in Schools, with an Appendix containing Lists of Archaeological Apparatus*, by J. L. Myres. (Clarendon Press.) 35 pp. 1s. net. They will find some practical hints, and also a few warnings which are not superfluous. Professor Gardner wisely recommends travel as the best possible incentive to the teacher; and raises a voice in the wilderness to proclaim how generously poor schoolmasters are helped to travel by the German government with their *Reise-stipendien*. He may wait until the Greek Kalends for such a thing to be done by an English government, unless some one performs a miracle and creates one which is really "efficient." As regards school work, readers are warned that a certain amount of preliminary knowledge is necessary before a boy can understand what a Greek drawing means; otherwise the artistic expression is too strange for him. It is also hinted not obscurely, that many of the pictures in the over-illustrated school books of to-day are not only unaesthetic but are positively misleading. Mr. Myres's catalogue of pictures and models is alone worth the price of the pamphlet.

Gaii Iulii Caesaris De Bello Gallico I. With Notes and Vocabulary for Beginners. By E. S. Shuckburgh, M.A. xxxiii. + 132 pp. Map and illustrations. (Cambridge Series for Schools and Training Colleges.) 1s. 6d.—The introduction contains a short account of Caesar and of the Roman army, with illustrations. The notes need strict compression, and there is too much translation; otherwise they are useful. Mr. Shuckburgh is an optimist: "The vocabulary is designed for the use of

¹ [Continued from page 64.]

beginners; others will still use their dictionary." Not if we know the British schoolboy.

The Fables of Phaedrus. Books I. and II. With Introduction, Notes, and Vocabulary. By J. H. Flather, M.A. xiii. + 68 pp. (Cambridge Series for Schools and Training Colleges.) 1s. 6d.—There is a dreadful mistake in the Introduction, where Mr. Flather calls a pyrrhic " by the name of "trochee" (p. xii.). He also scans *mūlērīam*, and nothing is said of the comic or colloquial licenses in the metre of Phaedrus. It is wholly incorrect, from the comedian's point of view (which is that of Phaedrus), to scan:

"quōd ārbōrēs lōquāntūr nōn tāntūm fērae."

The notes are adequate.

The Aeneid of Virgil. Book I. By H. B. Cotterill, M.A. xlii. + 159 pp. With Vocabulary. (Blackie.) 2s.—Mr. Cotterill has given study to his author, and there is original matter in his notes; especially such illustrations as he has drawn from observation of the African savage, which are often surprisingly apt. Introduction and appendices (on the Phoenicians, and on "Wings in Art") are interesting; but both they and the notes are too long for a school book. This is the book for a teacher to use; but when will editors learn that the learner requires as little as possible, and if practicable, that he is better without notes at all? The edition shows both learning and good taste. The pictures are capital.

Caesar's Gallic War. Book III. By J. Brown, B.A. xlii. + 99 pp. With Vocabulary. (Blackie.) 1s. 6d.—The notes in this book are briefer than in the last, and better suited to the schoolboy; they are quite adequate. The introduction, as usual, deals with Caesar and the Roman army (fully illustrated); appendices discuss ancient ships and Roman naval warfare. A few useful hints on translation are given, and exercises for re-translation appended.

Latin Composition, based upon Selections from Caesar. By B. L. D'Ooge, Ph.D. (Bonn). 36 pp. (Ginn.)—This book is designed to accompany a Reader by the same author. It consists of sentences, leading up to connected prose, which uses the vocabulary and constructions of the corresponding parts of the Reader; but in such a manner as to introduce new things gradually. All the chief usages of Latin syntax are worked in, and the index enables the teacher to find the place where each is exemplified. It is skilfully constructed, but from its plan is most useful for those who have the Reader.

P. Ovidi Nasonis Metamorphoseon Liber VIII. With Introduction, Notes, Vocabulary, and Index. By W. C. Summers, M.A. xx. + 107 pp. (Pitt Press Series.) 1s. 6d.—Unlike most of the school-book brood, this volume contains some original work. If Mr. Summers exaggerates in placing Ovid in the same class as Homer, Chaucer, and Spenser, he shows thus at least that he loves his author. We forgive him, therefore, for stating that Ovid had imagination. With allowance for this prejudice, the introduction is likely to interest readers. We should regard *fuera* = *erat*, by the way, not as due to metrical reasons (xix.)—a very unlikely thing—but as a survival of old Latin, where *fuera* and such forms were the preterite. The notes are good as a rule.

Edited Books.

The Victorian Anthology. By the Right Hon. Sir Mountstuart Grant Duff. 570 pp. (Swan Sonnenschein.) 7s. 6d.—The contents of this volume are of a higher order of excellence than the style of its binding; for while the compiler admits that he has not published it as representing any critical attitude on his own part towards Victorian poetry as a whole, but merely as

a collection of the things that please him; not as professing any degree of completeness but only as a selection dictated by his personal preferences; nevertheless Sir Mountstuart Grant Duff's known ability and eclectic taste in judging literature renders this volume a very pleasant companion for a leisure hour. Of course some names are omitted. One does not even find here Mr. Douglas Sladen or Mr. Coventry Patmore, nor Miss Katherine Tynan, Miss Norah Hopper or Miss Ethel Nesbitt, nor many others of the increasing band of minor celebrities in verse, some of the ambitious males among whom may feel that their claims to additional fame have been rather unfairly treated. If, nevertheless, the first two that we have mentioned might fairly (or more than fairly) have secured a place in these pages, and if Sir Mountstuart does make the admission that at least 120 other poets and poetasters are left unrepresented here, still it will, we think, be conceded by anyone who reads this volume without prejudice—especially a poet's prejudice in his own favour—that a very comprehensive and representative selection of admirable matter has been successfully made. It is true that in some cases the space secured by names already great seems a little in excess of the proportion devoted to many others of much excellence. Hence Macaulay gets a good deal, and Keble (one thinks) far too much. Matthew Arnold and A. H. Clough are represented at length, and the editor acknowledges his debt to the former in terms which are highly honourable to his own gift of discrimination; Tennyson naturally is too important to be ignored, but Browning is not over generously treated. Sir Mountstuart Grant Duff has, however, given us an anthology which is eminently serviceable; and whoso among modern critics will praise what is good, without demanding that it should be much better in order to satisfy his own taste, is likely to be of real service both to letters and to the public.

Legends of King Arthur and his Court. By Frances N. Greene. xxii. + 126 pp. (Ginn.)—In general character, this book may be compared with one of Lamb's Tales from Shakespeare, for it presents in prose form some stories of King Arthur as told by Tennyson. In a large part the text is a paraphrase of the poem, with occasional quotations in verse form. There is a simple introduction, and twelve excellent full-page illustrations from original drawings by Mr. E. H. Garrett. The book will inspire a love of good literature in children who read it or to whom it is read, and will serve a good purpose as an introduction to the classical versions of the King Arthur Legends by Tennyson and Malory.

Selections from the English Poets. The Goldsmith Anthology 1745-1774. Edited by Professor Edward Arber. 312 pp. 2s. 6d.—When this series came out first as a number of Anthologies and without illustrations, attention was directed in these columns to its many promising features. These one and all reappear in its new dress, and under its new title, and in addition the inclusion of a large number of well executed portraits make the newer series extremely valuable. Of the literary merits of this volume it is not necessary, therefore, to speak at all, but among the portraits an exquisite one of Horace Walpole deserves to be mentioned.

Macbeth. 122 pp. (Blackie.) 1s.—The best of the pictures in this volume is the frontispiece, which is in colours; the rest of the illustrations are hardly numerous enough to justify the title of the series. The notes are brief, and suitable for junior forms, but what should have been an introduction is placed obscurely at the end of the volume and called an appendix. Even so, it is not particularly valuable.

Much Ado about Nothing. The Warwick Shakespeare. By J. C. Smith, M.A. 173 pp. (Blackie.) 1s. 6d.—This volume, like many of its predecessors in this serviceable series, deserves to

be favourably mentioned for its general utility. The introduction makes very good matter, the notes are brief but excellent, the glossary is elaborately prepared, and, in as far as the thing can be done in a small book like the present, a genuine attempt is here made to deal with this charming play in its literary aspect and not merely as so much material for the study of philology or grammar.

English.

Webster's International Dictionary. 2,348 pp. and 5,000 illustrations. Twentieth Century Edition, with a new supplement of 25,000 additional words, phrases and definitions, prepared under the direct supervision of W. T. Harris, Ph.D., LL.D. (Bell.)—All students know, and very many use, the "International Dictionary." It has so long been our habit to work with this magnificent volume at our elbow that we have come to regard it as indispensable. It has decided so many disputes and cleared up so many difficulties for us that reference to it has almost developed into a reflex action. "Webster," in fact, has become the court of appeal at which we expect a final judgment. But though constant use had led to the conviction that the "International Dictionary" was as near perfection as possible, the appearance of this new and enlarged edition forcibly reminds us of the continuous growth of the English language and of the necessity, duly foreseen by the publishers, of revising and enlarging it, if it was to remain the best dictionary for practical, everyday use. It is true that from time to time new words have been inserted in the body of the work by means of extensive and costly plate changes, but in order to maintain the unique reputation secured by the Dictionary, the publishers have now added some 234 pages of new words which may largely be regarded as the outcome of the phenomenal Anglo-Saxon activity during the ten years which have elapsed since the last great revision of the Dictionary. These new words may be classified roughly under the following headings: Scientific, Technical, Foreign, Dialect, and Slang words. Dr. W. T. Harris, the United States Commissioner of Education, has, in his capacity of editor-in-chief, secured the co-operation of many special editors who have been severally responsible for different branches of knowledge, but the editor-in-chief has closely revised the whole supplement. The Dictionary may be obtained either in one or two volumes, bound in a variety of bindings, full particulars of which may be obtained on application to the publishers; but, for constant use, it would be difficult to improve upon the single volume, with marbled edges and bound in sheepskin, which is published at two pounds net. We strongly recommend the addition of this particular form of the new edition of the "International Dictionary" to every school's stock of reference books, and suggest that it might with advantage be put in an easily accessible position, for it would certainly soon be in constant demand by every teacher and every senior pupil. Comprehensive in scope, trustworthy in intelligence, and concise in definition, the Dictionary will long hold the foremost position which its merits have gained.

A Junior English Grammar. By W. Williamson, B.A. vi. + 231 pp. (Methuen.) 2s.—A somewhat novel feature of this book is the number of references to what may be termed market competitors, especially the well-known books of Messrs. West and Nesfield. Setting out with the intention of "revising" English grammar, the author naturally differs from other writers on the same subject. Much that he tells his readers is undoubtedly fresh and stimulating, but his treatment of that grammatical anomaly—the English gerund—is by no means convincing; personally we think it unscientific. The book is, confessedly, a compromise between old and new methods, and, as such, it cannot meet with unqualified approval.

The Language and Metre of Chaucer. Set forth by Bernhard Ten Brink. Revised by F. Kluge and translated by M. Bunting Smith. 280 pp. (Macmillan.) 6s.—By adding this volume to their series of works on English literature, the publishers have conferred a boon upon those students of Chaucer whose interest in him is not æsthetic or human, but grammatical and philological. It may at once be said that "it is caviare to the general," and presupposes a degree of advancement which would entitle a reader to become a candidate for the Modern Languages Tripos at Cambridge. Those who study Chaucer with the same avidity as some other people study Aristotle, and some few study Shakespeare, will find very serviceable the mass of clearly-arranged matter set forth here with magnificent care for detail. A biographical notice of Ten Brink himself, which is prefixed to this volume, serves happily to render it clear how such an elaborate volume was possible at all, and also to set up a standard of accurate scholarship on this side of the North Sea which is more common on the other. When Professor Ten Brink deals with Chaucer's rhyme, his use of alliteration, and of the general characteristics of his heroic verse, he grows very interesting indeed; and the account of Chaucer's treatment of the stanza in his lyric poetry, his management of the Ballade and its Envoi, his employment of the Roundel and other forms, will be of great service to those who are in any way attracted by the French and Provençal forms of poetry. The translation has been accurately and painstakingly done.

History.

Oxford Studies. By J. R. Green. Edited by Mrs. J. R. Green and Miss K. Norgate. xxxii. + 302 pp. (Macmillan.) 5s.—This little volume is a collection of papers written by the author of the "Short History of the English People" for publication in various periodicals, having for their subject for the most part Oxford in the Eighteenth Century. There are also articles on the "Early History of Oxford," "Young Oxford," and "Oxford as it is." Notes are added by the editors, and there is an introduction, biographical in its nature. All our readers know that J. R. Green's object in his study of history was, as he himself says in this book (p. 180), to "learn not merely how our forefathers fought and died, but how they walked, were dressed, ate, drank, spoke, laughed, or swore." And in these fugitive papers on the history of his birthplace and university he gives full play to these delights. There is very little that is deep in this volume, but the surface life of the town and university is told in Green's inimitable manner, and we recommend the book as a source of much pleasant and instructive reading.

The Student's Synopsis of English History. By C. H. Eastwood. 163 pp. (Arnold.) 2s.—This is a summary, "based chiefly upon Professor Oman's History of England," and on several similar manuals. There are chronological lists, genealogical tables, short biographies, tables of battles and important treaties, &c., &c. If only the work had been done with fuller knowledge and with more care in execution, it would have been as useful as other similar books we have seen. The ecclesiastical questions of the seventeenth century and the international events of the eighteenth, are the least satisfactory parts of the summary.

Certificate Note-book of European History, 1814-1848. By J. S. Lindsey. (Cambridge: Heffer.) 2s. net.—This is another of Mr. Lindsey's carefully prepared books of problems and exercises on history. It is not, however, one of the series on English history, but deals with the general history of Europe during the thirty years following the fall of Napoleon. The title indicates that it is specially intended to meet the require-

ments of the candidates for the "Certificate" examination of the Board of Education. Since this examination takes place early in July next, the appearance of this book seems somewhat belated. We trust, however, that it will have a much wider sphere of usefulness than its title would claim for it. It contains a bibliography which should prove of great value to Civil Service or University scholarship students, though it is absolutely caviare to the "Certificate" candidate for whom it is supposed to be intended. The sketch of the period and the thirty-two questions and answers seem well calculated to give a good grasp of most topics of prime importance.

A History and Description of Roman Political Institutions. By F. F. Abbott, Professor of Latin in the University of Chicago. 437 pp. (Ginn.) 7s.—Prof. Abbott's treatise is a most useful companion to the Roman history. We might offer the general criticism, that he might have been wiser to regard it wholly in this light, and accordingly to have shortened the purely historical part. It is true that the history is strictly subordinated to the main purpose, but in bulk it is considerable. Prof. Abbott has a firm grasp of principles, which he enunciates clearly. Take, for example, what he says of Tiberius Gracchus: "In securing the removal of Octavius from office, Tiberius was acting on the theory that a



Mexico City.

(From Keane's "Central America and the West Indies.")

representative of the people ceases to be such when in a particular matter he acts out of conformity with the wishes of a popular majority. The logical application of this theory in all cases would remove all constitutional limitations upon the expression and execution of the people's will, and would put the state absolutely under the control of a temporary popular majority. The principle was not only out of harmony with the genius of Roman political institutions, but it is subversive of stable government." The theory is now held by many, as our readers know, and the lessons of Roman history are here as often practically useful. Prof. Abbott also brings the tribunician veto into perspective better than we have seen it done elsewhere. The Roman institutions are followed down to Septimus Severus. Authorities and bibliography are also given, with textual specimens of acts and edicts. It is an excellent little manual, which we can cordially recommend, especially for teachers and the more advanced pupils in schools.

Geography.

Central and South America. Vol. II. *Central America and West Indies.* By A. H. Keane, F.R.G.S Edited by Sir Clements Markham, K.C.B., F.R.S. Maps and illustrations. xxiv. + 496 pp. (Stanford.) 15s.—A word in explanation of the title. A re-issue of the well-known Stanford's "Compendium of Geography and Travel" is now being made. In the original series Central and South America were described in a single volume; in the new series two volumes are devoted to them. The present, Vol. II., deals with Central America, the West Indies and the three Guianas. (For review of Vol. I. see THE SCHOOL WORLD, August, 1901.) We know of no series likely to be so serviceable to teachers as this. They will find in "Central America and the West Indies" ample illustrative material for their geography lessons, and a study



Bread-Fruit Tree.

(From Keane's "Central America and the West Indies.")

of the book cannot fail to be both informative and suggestive. Mr. Keane does not confine himself to mere details of topography; the ethical, physical and political conditions of each country are described in a lucid manner, and the book is never "dry." His remarks, for instance, on such questions as the Nicaragua and Panama Canals, the industrial future of the West Indies, and of the Guianas, will be read with interest. With regard to the Nicaragua Canal, Professor Helprin's views on the fluctuating level of Lake Nicaragua are referred to; personally, we think too much importance is attached to them in some quarters. We mention this in order to exemplify the general up-to-date character of the book. At the same time we are surprised that Mr. Keane has not made use of the U.S. official census (1899) of Puerto Rico in giving the population of that island. A special word of praise must be given to the illustrations, two of which are here reproduced. Unfortunately, we cannot say the same of some of the maps; something has gone wrong with the printing in one or two cases; that on p. 30 (in our copy, at any rate) is by no means a specimen of neat workmanship. However, the book is one that every teacher of geography who really takes an interest in the subject should buy and read.

The Journal of Geography. One of the most helpful periodicals known to the teacher of geography in England was *The Journal of School Geography*. The present monthly magazine represents the combination of this with *The Bulletin of the American Bureau of Geography*. Professor Dodge, whose editorship of *The Journal* was so successful, is now associated with Messrs. Goode and Lehnerts, whilst the associate editors include such well-known geographers as Messrs. Davis, Fennemans, Redway, Tarr, Ward, &c. The chief articles in the first number of the new magazine are: "Useful Products of the Century Plants," by W. B. Marshall; "Field Work in Physical Geography," by W. M. Davis, and "The Trade and Industries of Western South America," by E. R. Johnson. The printing and illustrations are beyond criticism. Teachers in Britain may obtain the new publication from Mr. E. McGegan, Outlook Tower, Edinburgh. The price is 10s. a number, or 6s. (10 numbers) per annum, prepaid. We recommend all teachers to see at least a specimen copy.

Science and Technology.

The Experimental Study of Gases. By Morris Travers, D.Sc. 320 pp. (Macmillan.) 10s. net.—The discovery of argon by Ramsay, and the subsequent liquefaction of air by Hampson and Linde, gave great impetus to the study of gases, especially those of the atmosphere. Dr. Travers summarises the recent work and discoveries on this subject. He begins with useful descriptions of the methods now employed in gas analysis, and gives many valuable practical hints on the construction of apparatus. The methods of calibrating apparatus are well described, and the remarks on taps, the preparation of pure gases, and their collection, are worth noting. The chief merit of the book, however, lies in the accounts of the practical methods of obtaining and separating the rare gases of the Helium group. Practical information on these points, notably in the preparation of helium, neon, &c., has, up to the present, been inaccessible to the majority of students. The book supplies a long-felt want in this direction. The details on the separation of helium from neon, for example, are lucidly given. The physical properties of gases—the relation of "V" to "P" and "t," and the methods of determination are stated with clearness. The book contains useful tables of the more important physical constants, and discussions on Van der Waal's equation, vapour pressures and critical phenomena. Many subjects for research are suggested. Dr. Travers writes clearly and concisely, with exceptional knowledge of his subject.

The Student's Hand-book of Stratigraphical Geology. By A. J. Jukes-Browne, B.A. xii. + 589 pp. (Stanford.) 12s. net.—Mr. Jukes-Browne is already well known both by his contributions to our knowledge of British geology and as the author of several important and interesting volumes on different branches of this ever-developing science. The present book is really an older work in a new form. It is based upon the author's "Student's Hand-book of Historical Geology," published in 1886; but the large accumulation of material made available by the continued investigations of an army of observers has rendered it necessary to rewrite the previous volume. The result is that we now have a complete account of the chief facts, up to date, of the stratigraphical geology of the British Isles, in which all the excellencies of the former book are repeated with the enhancement caused by the addition of small geological maps of the most important parts of the country from the geologist's point of view, and of many new illustrations of fossils and an instructive series of horizontal sections. To the private student these geological sections will prove of exceptional value. As teachers of geology know, there is nothing more difficult for the student than the exercise of the scientific imagination necessary for the production of a correct horizontal section showing the relation to one another of the strata of a district, and it should prove a very useful exercise to the student to follow in the field the sequence of beds shown in the clearly drawn sections here provided. The book may be highly recommended. It will serve both as an introduction to historical geology and also as a handy book of reference to the working geologist.

Practical Chemistry. By R. Abegg and W. Herz. Translated by H. T. Calvert. xiii. + 118 pp. (Macmillan.) 6s. This book of 120 pages forms a new departure in the literature of the working bench and merits serious attention. After dealing in twenty-three pages with simple preparations, a brief outline of the theory of reactions is given, and the rest of the book is devoted to qualitative analysis. The book is based on the theory of ionisation and Ostwald's dot-and-dash system for cations and anions is adopted. Reactions are generalised and distinctions made in the type between free ions and electrically neutral bodies; e.g., in speaking of the precipitation of zinc sulphide, we find $Zn^{++} + S^{--} = ZnS$. While giving every praise to this new objective, we think the work much too condensed for beginners, and its details not always judiciously chosen; e.g., after a most contracted account of the gaseous laws and voluminal corrections, we are told not to dry ammonia gas with sulphuric acid. Though metallic ores are described as a preface to the reactions for each metal, the dry tests and methods of solution are placed after all the wet reactions. Four groups only for the separation of the metals are employed, and alternate methods are given. The book ends with a new and carefully worked-out table for the separation of anions (acid-radicals). A statement on p. 16 referring to the dissociation of H_2S appears to somewhat contradict a reference to p. 13. The book is very free from printer's errors, and the only expression to which we take exception is "it reacts alkaline," which occurs more than once. The contents of the book, if filtered through the brains of the teacher, we heartily commend.

Mathematics.

A Treatise on Analytical Statics. By E. J. Routh, Sc.D., &c. Vol. II. Second edition, revised and enlarged. xiv. + 376 pp. (Cambridge University Press.) 14s.—This work, naturally, requires no recommendation: the contents comprise Attractions, Bending of Rods, and Astatics, and the principal change in the new edition consists of the discussion of electric and magnetic theory, so far as it illustrates the theory of

attractions. Various minor changes and additions have been made in other parts of the book.

Algebra. Part I. By H. G. Willis, M.A. vi. + 176 + xl. pp. (Rivingtons.) 1s. 4d. (without answers, 1s.)—A collection of examples for junior students arranged upon a very sensible plan. Most of the exercises are grouped in pairs of exactly similar type, two such sets being printed on opposite pages; and each set is graduated so as to give a fair hour's work to boys of different capacity. Oral questions are inserted at the beginning of each exercise: this is a very good feature. Examination papers are given here and there: at the end there are specimens of the Oxford Preliminary, Cambridge Preliminary, and Central Welsh Board papers (one of each). The collection is not altogether free from examples of a painfully artificial type: for instance:

$$3(x-2) + 16(27 - 45x) = 0;$$

Simplify $2[1+2(1-2\{1-2-x\}+2x)] - \{ -(-12) \}$; and the like. Moreover, such a question as "Divide $27+18a-9b$ by $3-a+2b$ to six terms" is quite ambiguous as it stands, and will lead to confusion, unless the teacher gives careful explanation. But, if used with discretion, these exercises will be found very helpful.

Knotty Points in Algebra. By A. E. Ikin, B.Sc. 116 pp. (Normal Correspondence College Press.) 1s. 6d.—There is nothing really novel in this, either in substance or treatment; but Normal students will probably find it useful as a supplement to their text-book, especially on account of the large number of examples which are worked out. On p. 48, $\sqrt{b^2-4ac}$ is three times wrongly put for (b^2-4ac) , and the rest of Art. 69 is erroneous: p. 57 is also incorrect, the fact being that $x-2\sqrt{x^2+x+5}-14=0$ does not admit of solution; but we have not detected any other errors, and Mr. Ikin's book is certainly better than most of its class.

The Tweeddale Arithmetics. Books I.-V. 32, 48, 56, 68, 84 pp. (Oliver and Boyd.) 3d., 3d., 3d., 4d., 6d.—These books contain an abundance of really well graduated and sensible exercises; worked-out examples; tables, definitions, and statement of rules, with brief explanations. Each book, except the first, concludes with sets of examination questions. A trial of this useful series may be confidently recommended. Collections of this kind generally give amusing specimens of bad grammar: the only one we have noticed here is, "Write down 6 three times, and add them together." Once more let the fact be noted that the compound rules demand nearly *two school years* for their due inculcation.

Miscellaneous.

The Use of Words in Reasoning. By Alfred Sidgwick. 370 pp. (Black.) 7s. 6d. net.—This is a strong presentation of the case against Formal Logic. Not that Mr. Sidgwick thinks that logic can be presented without some degree of formality, that is, without some general rules. The exceptions, however, to the rules he holds to be much more frequent than is ordinarily thought. "Exactly when logic is wanted to improve on common-sense views, formal logic breaks down," notwithstanding all its rules. Mr. Sidgwick holds that the educative value of formal logic is exaggerated. But Mr. Sidgwick does more than merely attack the schools. He presents in the last chapter of the book his views as to how logic might be taught so as to avoid the shortcomings and over-statements of formal logic, as he conceives them. He suggests a Method of Simplification. He shows how he would deal with the teaching of class-names as Predicate, Predication and Reasoning, Theory and Fact, and it is not saying too much to declare that he makes a scathing indictment of the ordinary teaching of

formal logic. For instance, Mr. Sidgwick trenchantly remarks, "Taken strictly, and interpreted as applicable generalisations, the laws of thought involve the assumption that ambiguity is impossible." The whole current of Mr. Sidgwick's objections to the present teaching of formal logic lies in the separation of the matter from the form of reasoning; of deductive from inductive reasoning. "The binding force of a syllogism cannot be understood except so far as we understand what is involved in avoiding ambiguous middle, and to do this we have also to understand how general theories of causal connections are derived from facts observed, how they are strengthened by them and criticised by them, and generally how fact and theory envisage each other. The question whether *S* is or is not the kind of *M* that indicates *P* is of vital importance in judging the validity of a syllogism, and it can only be studied by considering questions which are commonly reckoned as belonging to inductive logic." With much fulness of illustration and indication of his line of reasoning, Mr. Sidgwick maintains that logic "will remain an almost useless study so long as we forget that it is in the subject-matter of reasoning, not in any abstract 'reasoning process,' that all effective error is concealed." Mr. Sidgwick has challenged loudly the Formal logicians to give him an answer, and it is to be hoped that they will say what they can. In the meantime, everyone interested in the teaching of logic should read Mr. Sidgwick's book, and call on Mr. Sidgwick or some one else to construct an elementary text-book on the interesting lines which Mr. Sidgwick sketches.

Selections from the Works of Fourier. With an Introduction by Charles Gide. Translated by Julia Franklin. 208 pp. (Swan Sonnenschein.) 2s. 6d.—Fourier is a writer of whom it is emphatically true that half his work is greater than the whole. He lends himself, therefore, to selection. In an age in which it is said that "we are all now socialists," a selection from his writings is opportune. The introduction is decidedly thoughtful and interesting. With it and the selections the general reader can readily acquaint himself with all that he need, or will care, to know of Fourier. The ideal of "attractive labour" for everyone is good optimistic reading, which it is well to have in the handy form presented by this book.

Slide-Rule Notes. By Lt.-Col. H. C. Dunlop, R.F.A. and, C. S. Jackson, M.A. 66 pp. + 11 plates. (Simpkin, Marshall.) 3s. net.—This is a good attempt to render the theory of the slide-rule clear to anyone already acquainted with the elements of algebra and trigonometry, and it will be found to be a useful supplement to the elementary instructions usually supplied with such an instrument. A short account of the fundamental principles of logarithms, the construction of a logarithmic scale, together with their applications to the processes of multiplication, division, involution and evolution, are followed by clear explanations of the solutions of quadratic and cubic equations. The plotting of curves from given equations, in which from assumed values of one variable corresponding values of the other can be obtained, is then treated. The slide rule may be used to obtain numerical values from somewhat complicated expressions, and in such cases a series of settings and readings is generally necessary; the authors have clearly indicated, not only the errors which may occur, but also how they may be reduced. In "Miscellaneous Notes" a series of examples is given, the solution in each case being obtained by using a slide rule. In addition about 50 exercises are given for practice.

Schools at Home and Abroad. By R. E. Hughes, M.A., B.Sc. 344 pp. (Swan Sonnenschein.) 4s. 6d.—This book is a collection of essays and addresses on educational topics prepared at various times by the author. Mr. Hughes's experience as an Inspector of Schools and his wide knowledge of the

education of other countries qualifies him to speak with some authority on the subjects with which he deals. Though it is more or less unavoidable in addresses prepared at intervals, there is an irritating amount of repetition in the volume, and it would have been worth while to edit the separate papers before publishing them together. Elementary education receives the chief attention, and it is gratifying to find that Mr. Hughes is of opinion that English elementary education and elementary-school teachers compare very favourably with those of other countries. In discussing the aim of the secondary school, after maintaining that its primary object is the formation of character, the author goes on to say: "If, then, fine character and trained intellect are our ideals, how futile, how utterly extravagant is it to send children to a secondary school for a year or two? It is absurd to expect characters to be built and intellect trained under, say, four years. Either four years as a minimum or not at all, say I. Much better complete the boy's education in the primary school than send him for a top dressing to a secondary school, where his ideas of life may be unsettled and a vague dissatisfaction engendered." It would, in view of this opinion, be interesting to hear what Mr. Hughes has to say on the Higher Elementary School Minute and its age limit. The writer has fairly succeeded in his aim, which was, he says, to make the mass of material in the form of statistics and official reports more easily available for teachers and others interested in education.

A Text-book of Political Economy. By E. C. Robinson, M.A., LL.B. 233 pp. (Normal Correspondence College Press.) 2s. 6d. net.—This is an examination text-book. In a book of 233 pages, including index, there are thirty chapters, each taking an important subject and dealing with it in an extremely concise manner, such as delights the examination student. Within its limits it is very comprehensive. It contains a large number of quotations. It abounds in definitions. Summaries are frequent. There is a large number of references to classical works on Political Economy, and if these were first consulted by the student, there would be a real use for this book as summarising many conclusions. The collection of questions and notes at the end of each chapter will be found distinctly attractive to the examination student.

CORRESPONDENCE.

The Editors do not hold themselves responsible for the opinions expressed in letters which appear in these columns. As a rule, a letter criticising any article or review printed in THE SCHOOL WORLD will be submitted to the contributor before publication, so that the criticism and reply may appear together.

General Knowledge in Scholarship Examinations.

IN the current issue of your Journal, Mr. H. T. Gerrans, while deploring the specialisation which public-school boys have to go through if they wish to compete for scholarships at Oxford, repudiates the statement that scholarship examinations are the main cause of it.

At a recent meeting of Public-school Science Masters a paper written by me was read, in which I tried to show that scholarship examinations, as now conducted, are responsible for the present state of things. Further, I believe that the majority of schoolmasters will require something more than Mr. Gerrans' *ipse dixit* before they change their minds on this point.

So much is required of a boy who tries for a scholarship, and the competition nowadays is so keen, that it is impossible to avoid specialisation, often begun at a ridiculously early age. It

is a notorious fact that the one great public school where specialisation is most encouraged, as a rule carries off most of the important scholarships at Oxford and Cambridge. At several colleges the "General Paper," on which Mr. Gerrans lays so much stress, if set at all, is a mere farce, and candidates who have passed the Higher Certificate are not always required to answer it.

As I have elsewhere pointed out, the only way to real reform in public-school curricula lies in the hands of the Universities. Let them insist that a candidate shall show a fair elementary knowledge of literature, mathematics and science (all these three subjects are part of his general curriculum) and at the same time a more advanced knowledge of *one* of them, and specialisation, with its attendant evils, will vanish for ever.

In the matter of scholarships and exhibitions, the Universities "pay the piper." Let them by all means continue to "set the tune." But surely the time has come when it may fairly be asked whether that tune is in accord with modern educational progress.

M. DAVENPORT HILL

Eton College.

I REGRET that Mr. Davenport Hill does not share the opinions expressed in the short article which I wrote at your request.

I append the General Paper set in a competition for mathematical scholarships and exhibitions at Oxford last week. None of the candidates were excused this Paper. (Some of them held "Higher Certificates.") More than one owed his success to his performance on the General Paper.

H. T. GERRANS.

Worcester College, Oxford.

General Paper.

Candidates are advised to attempt question 12 and not more than five others.

- (1) Sketch the plot of *either* As You Like It, *or* Hamlet, *or* Ivanhoe.
- (2) What inferences do you draw from the Waterloo campaign as to the relative merits of Napoleon and Wellington as generals?
- (3) What are the functions of the Local Government Board, a County Council, a Sheriff, a President of the Council?
- (4) Compare the powers of the British Parliament *either* with those of the German Reichstag, *or* with those of the Congress of the United States.
- (5) Is the establishment of an Academy in this country desirable?
- (6) Give the theory *either* of the electric telegraph *or* of the telephone.
- (7) Natural frontiers.
- (8) Indicate the importance of five of the following:—Alexander the Great, Julius Caesar, Attila, Gregory the Great, Thomas Aquinas, Michael Angelo, the Emperor Charles V., Richelieu, Cromwell, Mozart, Byron, Palmerston, R. L. Stevenson.
- (9) The poetry of Rudyard Kipling.
- (10) The use of the symbol $\sqrt{-1}$.
- (11) International athletic contests.
- (12) [Two passages, each of about 200 words in length, one in French and the other in German, were given for translation.—Eds., S.W.]

The Teaching of Geometry.

EVERYONE who has had experience in teaching elementary mathematics probably feels some interest in the questions of reform now under discussion. But there are many who view with apprehension the possibilities of wide-reaching change planned by a Committee whose members—however eminent in their own sphere—have for the most part had very little

experience in teaching elementary mathematics to young students.

After carefully reading all the speeches and expressions of opinion immediately arising out of the British Association meeting, besides the subsequent papers published in *Nature*, THE SCHOOL WORLD, and the *Mathematical Gazette*, I am more and more impressed with the conviction that we are likely to be landed in what Professor Lamb called "a disastrous muddle," unless extreme caution is observed in the initial stages of reform.

I have spent some time in making extracts from the published speeches and papers in order to bring together in brief comparison and contrast some of the widely different opinions which have been expressed. It would occupy too much space to quote these here, but they furnish a striking and interesting proof of the fact that among the reformers themselves there is no basis of agreement upon which they can take their stand.

This initial divergence of opinion is the strongest argument against the precipitate haste with which this movement is being pushed forward. Moreover, we may fairly ask, how many of the speakers have had any real practical acquaintance with the needs of young pupils; how many have successfully handled large classes; and how many of them are able to claim that the views they express are the results of ripe experience—not of professional or university teaching on the one side, or the requirements of certain technical professions on the other, but of ordinary school-work with all its special needs and restrictions. I have heard Sir John Gorst's opinion echoed again and again: "I only regret that so many of our speakers have been professors in universities, and so few have been practical teachers in schools."

I have myself taught mathematics for more than twenty-five years to boys of all grades of ability, from the future Smith's Prizeman to the veriest duffer who ever presented himself in trepidation for Responsions or "Little Go." And I confess that I am lost in amazement at some of the opinions expressed at the Glasgow meeting, and repeated since. To take only one of these: again and again reference is made to learning Euclid by heart. This is clearly beside the mark. If such cases occur they are due to exceptional defects of teaching and examining, and to nothing inherent in Euclid. No presentation of geometry or of any other subject will exclude manifest incompetence; and it is certain that a teacher who cannot prevent his pupils from learning Euclid by rote will never succeed in teaching geometry on any other system; nor could such a teacher be trusted with the freedom suggested by some of Prof. Perry's supporters. Personally I have never come across this degree of fatuity on the part either of teacher or boy, and I believe the danger to be wholly over-stated; but, so far as it is justified, it is an argument neither for nor against Euclid, but a plea for constant *viva voce* work in geometry, and for some rudimentary intelligence on the part of the teacher. As a further instance of the prejudice introduced into this discussion by over-statement, I may mention the assertion that "the schoolboy is not taught geometry: he is taught to remember the words of Euclid." Or again, that in examinations the text, and even the lettering, of Simson's Euclid are insisted on. Surely it is rather late in the day to point out that there is hardly a modern text-book of Euclid to be found which does not deviate from Simson more or less in both these respects. As regards the actual wording of the proofs, it would be easy to name several good books in which the resemblance to the old Simsonian language is extremely slight.

As a schoolmaster, I hope I may enter a protest against the idea of beginners being set down to learn Euclid. In the school with which I have long been connected our boys always begin with graduated ruler and compasses, and are not introduced to

any formal geometry until they have gone through a considerable course of easy geometrical drawing. Their first text-book is Mr. Bradshaw's admirable "First Step in Euclid," and from this they go on to one or other of the modern editions of Euclid, being encouraged from the very first to pay much attention to easy exercises. As for the *learning* of Euclid, the propositions are explained on the black-board, with varied lettering and diagrams, and made interesting by concrete illustrations. But in the early stages written work always occupies a subordinate position; the boy has little to "get up" and little to write; he is constantly being made to think for himself, the stimulus being furnished by frequent examination at the black-board. When it comes to writing out the propositions, he is *not* asked to reproduce the text with verbal accuracy; he is encouraged (sometimes compelled) to use different lettering, abbreviated language, and varied diagrams. In a word, his intelligence and interest are evoked at every stage. With such a beginning as this—and it is by no means confined to this or that school—Euclid is robbed of its terrors, and made what Major MacMahon called "an instrument for the cultivation of the mind."

In this connection it may be observed that the controversy has so far recognised only two classes of learners: (i.) the students of mathematical ability who propose to follow up the subject at the university or elsewhere; (ii.) those who require at an early stage a familiarity with mathematical results for the purposes of applied science in some future profession. It may be doubted if these two classes together cover more than ten per cent. of the boys in our secondary schools. The discussion is surely incomplete until it has considered the needs of that enormous preponderance of pupils who, without aptitude for mathematical study, and under no necessity of acquiring technical knowledge, may and do derive real intellectual advantage from lessons in pure deductive reasoning. Nothing has as yet been devised as effective for this purpose as the Euclidean form of proof, notwithstanding possible objections from the point of view of pure mathematics or practical geometry.

At the same time I am willing to admit that there is much to be said in favour of a shortened course of Euclid by judicious omission and re-adjustment. And this brings us to the suggestions made by a Committee of twenty-two masters, as published in *Nature* and elsewhere. Their proposals with regard to geometry appear to be the most sensible that have yet been propounded; still it is only fair to remark that the memorandum is not a spontaneous one, that it reflects a partial opinion from nine schools only, and in some of these the older and more experienced masters are conspicuous for their silence.

The legislation that is being attempted is to affect all the pupils and all the teachers in some thousands of schools: for this reason alone anything like hasty or sweeping change is to be deprecated. If a sensible beginning through the medium of easy geometrical drawing can be insisted upon, and this followed up by a judicious selection of the essentials of Euclid, I venture to think it is as much as can be carried through with safety at present. One thing seems certain, viz., that some of the ideas so confidently proposed by Prof. Perry can never be carried out under the restrictions and limitations inseparable from the teaching of pupils of various ability in large classes. He talks, for instance, of the "thoughtful teacher" adapting his sequence to "the particular kind of boy he has to teach." Any master of experience would answer that several particular kinds of boy may exist in a comparatively small class. Then his other concluding suggestions about what is to be "left to the judgment of the teacher" and what the "thoughtful teacher ought to know" . . . "may freely use" . . . "may allow" are vague and unpractical. Under no system will it do to act on the supposition that all teachers are sufficiently experi-

enced and "thoughtful" to be left to themselves or to wide discretion.

The frequent changes in a staff of teachers have to be taken into account, and it is impossible to ignore all the difficulties and limitations arising out of a pupil's successive stages as he passes from one class to another through the hands of different teachers. Finally, if it is true, as it has been said, that we "shall need better teachers for the new syllabus than for the one it is intended to displace," and that "an indifferent mathematician would do much harm, because so much is left to his own badly trained initiative," it is equally true that experience is the only test of good teaching; and it is possible, as I have myself seen, for a Smith's Prizeman to fail miserably, while his colleague, who took a very humble place as a Junior Optime, was a successful and inspiring teacher of Euclid, with a real love for the subject.

As I have criticised freely the opinions of some who are known to me either personally or through correspondence, and as I have no wish to advertise a school where I believe Euclid has for many years been taught rationally and with good results, perhaps I may be allowed to hide my identity under the signature

EXPERIENTIA DOCET.

. Since this was written, a special mathematical number of THE SCHOOL WORLD has been issued. In one or two places I appear to have traversed exactly the same ground as other writers, but I have thought it best to leave my remarks unaltered, as a spontaneous contribution to the discussion.

Biographies in English History.

WILL you kindly let me know any book which contains biographies of personages occurring in the History of England? We teach the outlines of the whole history of England, including the Saxon period.

Of course, biographies are included in the usual text-books, but I require a school book entirely devoted to biographies.

Also, please let me know whence I can get examination test-cards on the History of England, and English Composition and Grammar.

P. B. JORLIE.

Grasia College, Gondal,
Bombay Presidency.

(1) *Class-book of Biographies in English History.*—The most suitable books known to us are "The British Biographical Reader" (Blackie, 1s. 6d.) and "Famous Englishmen" by John Finemore (Black, 2 vols., each 1s. 4d.). The former contains character sketches, rather than biographies, of seventy-five great men in various departments of life; and they are taken from the writings of such men as Fuller, Macaulay, Froude, and Guizot. The latter deals with twenty persons in the first volume, extending from Alfred to Elizabeth, and is illustrated. This volume was fully described in the August, 1901, issue of THE SCHOOL WORLD. Messrs. Black have in preparation a four-volume series entitled "History in Biography," which might interest our correspondent.

There is much biographical matter in the excellent Readers now being published by Messrs. Arnold, Longmans, McDougal, and Macmillan. The only volumes of the kind recommended in Prof. Withers' recent Memorandum—Miss Stirling's "Touch-bearers of History" (Nelson, 3s. 6d.) and Miss Yonge's "Book of Golden Deeds" (Macmillan, 2s. 6d.)—deal with foreigners also.

(2) *Test Cards in History and Composition.*—We know of none published as test cards. But some reprints of SCHOOL WORLD test-papers are still on sale.

Subjects for London Matriculation Examination.

THE A.M.A. Committee seem to recommend that the "English" subject at Matriculation should be "mother tongue, English History, and Geography."

Might I suggest that, if the Regulations are to be modified, it would be a good opportunity to get rid of that time-honoured absurdity, "English History to the end of the Seventeenth Century." Why such a period was first chosen, and why it has remained so long, are mysteries which can hardly admit of satisfactory explanation. But the mere fact that it has been "the Matric. period" during the past generation is no reason why it should continue for another generation. I should like to suggest as a substitute—seeing that the University of London is the nearest approach we have to an Imperial University—"the outlines of *British History*," in a wide but not detailed sense. *How have the British Islands, once a remote and negligible dependency of a Mediterranean Empire, come to be the centre of a world-wide Occanic Empire?* That, I take it, should be the central thought—to be taken in close conjunction with both "mother tongue" and "geography." By the way, *English* is not the "mother tongue" of all citizens of our "free, tolerant and unaggressive empire." Such a wide subject would need to be limited in practice by (a) a syllabus, (b) observance of the syllabus (which, to judge by the past, is a very exacting demand to make on London examiners). Above all, there should be a non-expert moderator of a kind who, confronted with Q. 8 in the paper set last January, should draw his pen through *Alney, Brill, Tutbury and Smerwick*, on the ground that "I've never heard of them, and what I don't know isn't knowledge that ought to be made compulsory for matriculants."

Doubtless "General History" would be somewhat better; but, considering how very many of those who take the Matriculation Examination are destined to be teachers, having "our national history" as one of their class subjects, I suggest *British history* as practically more suitable.

C. S. FEARENSIDE.

Cambridge.

The School World.

A Monthly Magazine of Educational Work and Progress.

EDITORIAL AND PUBLISHING OFFICES,
ST. MARTIN'S STREET, LONDON, W.C.

Contributions and General Correspondence should be sent to the Editors.

Business Letters and Advertisements should be addressed to the Publishers.

THE SCHOOL WORLD is published a few days before the beginning of each month. The price of a single copy is sixpence. Annual subscription, including postage, eight shillings.

The Editors will be glad to consider suitable articles, which, if not accepted, will be returned when the postage is prepaid.

All contributions must be accompanied by the name and address of the author, though not necessarily for publication.

The School World

A Monthly Magazine of Educational Work and Progress.

NO. 41.

MAY, 1902.

SIXPENCE.

THE EDUCATION BILL, 1902.

IN fulfilment of the promise contained in the King's Speech, that "proposals for the co-ordination and improvement of primary and secondary education" would be laid before the House of Commons this Session, Mr. Balfour, on Monday, March 24th, introduced the Government Education Bill. The Bill is a large and comprehensive measure, dealing as it does on the one hand with the provision of secondary education and on the other with the improvement of voluntary schools and the supersession of school boards. But the scheme is marred by its permissive character. An option is given to local authorities to supply or not secondary education and to assume or not the control of elementary education within their area. It is satisfactory to find that this grave limitation meets with approval on neither side of the House. Sir Richard Jebb and Dr. Macnamara were both agreed on the occasion of the first reading in urging the Government to amend the Bill in this particular. Very properly, we think, the consideration of the peculiar needs of London is postponed for the present, and the Bill, thus lightened, is much more likely to become law. But, as Mr. Bryce's speech on the occasion of the introduction of the Bill showed, there are many points on which much criticism is to be expected, and already the din of vigorous discussion and implacable opposition leads to the fear that the multiplication of amendments and the prolongation of the debates in the House may make it impossible for the Bill to survive the periodical "slaughter of the innocents." But we hope for the best. Believing as we do that the Bill contains the making of a good secondary education measure and that with some alterations it would result in the improvement of primary education, we trust that all who have power to influence the chances of legislation will be actuated only by a desire to establish English education on a more satisfactory basis and give no support to those who place personal interest before national well-being.

LOCAL EDUCATION AUTHORITIES.

The Bill arranges that the local education authority shall be the council of every county and of every county borough, provided that the council

of a borough with a population of over 10,000, or of an urban district with a population of over 20,000, shall, in such cases, be the local education authority for the purpose of elementary education.

SECONDARY EDUCATION.

The conditions under which local education authorities may supply or assist education other than elementary are, with one addition, similar to those of the Bill of last year. The money accruing from the Local Taxation (Customs and Excise) Act, 1890, and hitherto used only for technical education, is to be available for secondary education, and the authority may also levy a rate of two-pence in the pound. In cases where the revenue thus provided is insufficient the council concerned may apply for power from the Local Government Board to levy a higher rate.

The council of any non-county borough or urban district who take over the control of elementary education will have power, concurrently with the county council, to spend such sums as they think fit on secondary education, but such council may only levy a penny rate for the purpose.

No council may require any particular form of religious instruction or worship in any school aided out of the council's funds, nor may they require any scholar in their schools to attend or abstain from attending particular places of worship.

ELEMENTARY EDUCATION.

The sections of the Bill affecting elementary education apply only to those areas where the local authority have by resolution adopted this part of the measure. In areas where the control of elementary education is taken over by the local education authority, they will have throughout their area the powers and duties of a school board and school-attendance committee and the control of all secular instruction in public elementary schools, whether provided by them or not. School boards and school-attendance committees will consequently be abolished in such areas.

The managers of elementary schools provided by the local education authority will be appointed by the authority, but the present managers of voluntary schools will continue in office, though the education authority may appoint additional

managers, so long as their number, if more than one, does not exceed one-third of the whole number of managers. The maintenance of all schools, voluntary or otherwise, will be in the hands of the local education authority. In the case of voluntary schools it will be the duty of the managers to keep the schools in good repair and to make such alterations and improvements in the buildings as may be reasonably expected by the local education authority. The education authority, too, have supreme control over the secular instruction in voluntary schools, they may also inspect such schools and audit the accounts of their managers. The appointment of teachers in voluntary schools is, so far as educational efficiency is concerned, subject to the consent of the education authority, but nothing is said in the Bill as to the dismissal of these teachers.

Difficulties which may arise between the local education authority and the managers of a voluntary school are to be settled by reference to the Board of Education.

When the local education authority or any other persons propose to provide a new school, they must give public notice of their intention, and the managers of any existing school, and the local authority (if it is not they who propose to provide the school), and any ten ratepayers in the area, may, within three months after the notice is given, appeal to the Board of Education on the ground that the proposed school is not required, and any school built in contravention of the decision of the Board of Education on such appeal shall be treated as unnecessary. A school actually in existence shall not be considered unnecessary in which the average attendance is thirty. In deciding, on any appeal as to the provision of a new school, whether an existing school is necessary or not, the Board of Education shall have regard to the interest of secular instruction, to the wishes of parents as to the education of their children, and to the economy of the rates.

GENERAL.

For educational purposes councils will act through an education committee, constituted in accordance with a scheme made by the council and approved by the Board of Education. All such schemes must provide that the council appoint a majority of the education committee, and for the appointment by the council of persons of experience in education. Where it appears desirable, other bodies will nominate these persons.

Any county governing body constituted under a scheme of the Welsh Intermediate Education Act may be the education committee of the council or county borough in Wales and Monmouthshire.

Such are, in general terms, the leading provisions of the Bill before Parliament. Many details of administration have been left on one side as being of only secondary interest to teachers. Those who are anxious to study the further details of the Bill can obtain a copy of it for twopence from Messrs. Eyre and Spottiswoode.

Following our usual practice, we have endeavoured merely to state the chief facts of the case, and have purposely refrained from a consideration of the claims of separate educational parties and the wishes of individuals on particular points. The chief object is to secure better education for the country, and in pursuance of this aim it is much to be desired that party feeling and sectarian bias may be kept in the background when the Bill is brought in for its second reading.

KENILWORTH.¹

By J. A. NICKLIN, B.A.

Late Scholar of St. John's College, Cambridge.

SIR WALTER SCOTT, in the Introduction to his romance of "Kenilworth," has told us that it was his success in the delineation of Queen Mary that induced him to attempt something similar for "her sister and her foe." In several ways the task was more difficult. The rude feudal society of the Border offered more facile material to a romance than the artificial life of Elizabeth's court, which necessitated a reconstruction of contemporary manners, based on the study of literary sources. Such a reconstruction has only once been entirely successful, that is in Thackeray's "Esmond." Scott himself had failed badly in the Euphuist, whom he introduced into "The Monastery." Nor could Elizabeth be made the heroine of such an affecting history as could be drawn from every period of Mary's life.

Scott has chosen an aspect of Elizabeth's many-sided character which, perhaps, lends itself better than any other to the novelist's purpose. She appears in "Kenilworth" as "at once a high-minded sovereign and a female of passionate feelings, hesitating betwixt the sense of her rank and the duty she owed her subjects on the one hand, and on the other, her attachment to a noble who, in external qualifications at least, amply merited her favour."

The central interest of the theme lies in the *impasse* into which ambition and a secret marriage have brought the Queen's ruling favourite, Leicester, who is urged on by unscrupulous adherents, by his own thirst for power, and by his credulous superstition, to grasp at the crown matrimonial, while the unacknowledged alliance which he has contracted threatens him with ruin by its disclosure.

"Kenilworth" is rather a series of striking scenes and *tableaux* of historical figures than an elaborate character study, but the development of the conflict in Leicester's mind between pride and affection is worked out in careful detail. Especially convincing is the manner in which Varney plays on his master's vacillating spirit, now by showing him the prize almost in his reach, and now by bringing home to him the triumph of his hated rivals that would make his retirement intolerable.

¹ Subject for the Teachers' Certificate Examination, 1903.

The character of Amy Robsart is developed just so far as the nature of the plot requires. It was necessary that she should be confiding, inexperienced, and naturally timid, yet spirited and resolute in the assertion of her honour and rights. It was such a combination of qualities that, given such a character of Leicester and the equivocal position of the ill-assorted pair, made the catastrophe inevitable. The evil genius of the plot, Varney, is an English Iago, not depicted, it is true, with the force and subtlety of Shakespeare's character, but redeemed by a few respectable traits from the unrelieved blackness of soul which makes the villain of the Italian Renaissance appear to us incredible and monstrous.

The introduction of Raleigh upon the scene does something more than conjure up the memory of a great man and a brilliant personality. It underlines, as it were, the difficulties of this subtle courtier's art which takes entire possession of Leicester to the exclusion of every other claim. It displays the capriciousness and violent change of mood of Elizabeth, but also the high and generous spirit which really held in fascination her people and her court.

Leicester makes an appropriate central figure round which to group many varieties of social life, because of the immense range of ill-assorted interests which it was his rôle to manipulate to his own advantage. Scott has put into Varney's mouth an apt illustration of this:—

The course my lord holds is no easy one, and he must stand provided at all points with trusty retainers to meet each sort of service. He must have his gay courtier, like myself, to ruffle it in the presence-chamber, and to lay hand on hilt when any speaks in disparagement of my lord's honour . . . he must have his lawyers—deep, subtle pioneers—to draw his contracts, his pre-contracts, and his post-contracts, and to find the way to make the most of grants or church-lands, and commons, and licenses for monopoly. And he must have physicians who can spice a cup or caudle. And he must have his cabalists, like Dee and Allan, for conjuring up the devil. And he must have ruffling swordsmen, who would fight the devil when he is raised at the wildest. And above all, without prejudice to others, he must have godly, innocent, Puritanic souls . . . who defy Satan, and do his work at the same time.

Scott has tried to reconstruct Elizabethan society with typical examples of the different classes and characters of men. Raleigh stands for the new culture and restless energy of the Renaissance; Sussex for the able warrior and administrator who cannot accustom himself with ease to supple compliances of court life; Blount for the country squire who acquits himself creditably in the field, but cuts a ridiculous figure at court, and thinks with regret of his five hundred foul acres in Norfolk; Anthony Foster for the morose and bigoted Catholic who, following a national revolution, becomes an equally bigoted and morose Puritan; Hunsdon for a survival of the rough and untutored spirit of the feudal age. The dark side of the Renaissance appears in Varney—the English analogue, as I have said, to Iago—in Michael Lambourne, who illustrates the

ferocity and vices which English soldiers brought back from the Low Countries, and from buccaneering expeditions on the Spanish main, and in the astrologer, physician, and poisoner, Alasco.

Scott is fond of exercising "the privilege of tale-tellers to open their story in an inn, the free *rendez-vous* of all travellers, and where the humour of each displays itself without ceremony or restraint," or at least of utilising this "free *rendez-vous*" as a means of bringing together very different social *strata*. The tavern talk serves, too, as here and in "Old Mortality," to supply a kind of running commentary—like the chorus in a Greek play—from the point of view of the average man chiefly interested in his own business and comfort, on striking historical events. Giles Gosling, like the landlord of the Howff, in "Old Mortality," is the genial but selfishly cautious burgher who declines to meddle, not only in matters of politics, but in any affairs that might possibly bring him into conflict with persons of influence. By the simple device of making Tressilian's horse cast a shoe, Scott introduces us to a *ménage* of English rural life. Gammer Sludge is not a piece of brilliant characterisation, and will not bear comparison for a moment with Shakespeare's Warwickshire peasants. For one thing, it is almost impossible to reproduce minutiae of manners of a past age without either caricature or pedantry. For another, Scott did not understand the Berkshire rustic as he did the Clydesdale hind. Master Erasmus Holiday does indifferently well as an example of the diffusion of learning among the poorer classes in Elizabethan times, when scholar and pauper were frequently synonymous.

It might be thought that the locality of Cumnor rather than Kenilworth, which furnishes the title, dominated the plot. But the struggle in Leicester's mind between affection and honour, on the one hand, and pride and the instinct of self-preservation on the other, comes to its climax at Kenilworth. There, too, the final struggle in Elizabeth's breast between love and her sense of rank and queenly obligation is fought out. Those, as I have said, are the prevailing features of Scott's conception. The contrast between the Earl's apparent triumph over his rivals, and his inner discomfiture and secret peril, and the helplessness and neglect of the disguised and unrecognised countess, among the splendours of which she was the rightful mistress, afford some of the most striking situations in the book. And, finally, the pomp and magnificence of the Queen's entertainment in the most imposing of English baronial castles gave Scott the materials for a piece of historical scene-painting which was probably a leading motive in his choice of subject.

THE prospect of a theory of education is a glorious ideal, and it matters little if we are not able to realise it at once. Only we must not look upon the idea as chimerical, nor decry it as a beautiful dream, notwithstanding the difficulties that stand in the way of its realisation.—Kant.

THE GROWTH OF EDUCATIONAL IDEALS DURING THE 19TH CENTURY.¹

THE EDUCATION OF GIRLS AND WOMEN.

By SARA A. BURSTALL, B.A.

Headmistress of Manchester High School.

II.

THE earlier article on this subject ended with the three recommendations of Mr. Bryce's report to the Royal Commission (1867). It may be convenient to take the third of these first, that, namely, dealing with higher education. The provision and development of institutions where women could receive this went on very rapidly after 1870, and this movement had an immediate effect on the schools. At the earliest possible moment college women became teachers in the more progressive of these, and began to influence them; while the demand of the colleges for better preparation stimulated and helped the work of women like Miss Buss and Miss Beale in their efforts to move public opinion. In Miss Clough's *Life*, to which we have already referred, there is a full account of the whole story of Newnham, begun by her in 1871, when, under the auspices of Dr. Sidgwick, a house was opened in Cambridge to receive the first five women students. At this stage, and indeed for many years later, there was a considerable divergence of aim between Girton and Newnham. The former had been established with the express intention of following the course laid down by the University for men students: the women prepared for the "Little Go," observed the rules as to terms, and studied for the triposes, to which they were informally admitted in 1873. Miss Emily Davies and those who worked with her disapproved of any examinations for women exclusively, considering that these would tend to lower the fixed standard necessary for the improvement of women's education, and that such certificates would carry but little weight in the outside world. The Newnham authorities, on the other hand, did not approve of the "Little Go" educationally, and thought that greater freedom and elasticity were desirable, especially for the women teachers who might be able to come to Cambridge to study, or to take the "Higher Local" independently, but who could neither afford the time nor the money for the complete University course. Miss Buss, who had always in view the recognition of women's work as equal to that of men, and the practical and economic questions connected with earning a living and with professional status, threw the whole weight of her influence to the support of Girton, and for years her pupils formed no inconsiderable element among the students there. However, when the London degrees were opened in 1878, the fact that full recognition and equality

were granted by this University led Miss Buss rather to prefer that her girls should take advantage of these opportunities; thus to work for the London degrees became part of the line of tradition formed by her, especially after the brilliant success of Mrs. Bryant, the first woman D.Sc., who began in 1875 to work in the Frances Mary Buss school.

At Cheltenham, too, the opening of the London degrees helped in the development of the higher and more advanced teaching which had always been part of Miss Beale's plan, and ever since



Miss Dorothea Beale.

students there have successfully prepared for the full B.A. course, including the honour sections. At the beginning doubtless both the Newnham and the Girton ideals were necessary: it is interesting to note that of late the two have converged, and that the very high entrance requirements of Newnham, higher than those of any other woman's college, prove how the need for special allowances to girls and to women has passed away. The examination for which the original students prepared (the Higher Local) has now become the standard for admission.

In 1875, as we have seen, the Newnham building, now known as Old Hall, was occupied. The number of students under Miss Clough steadily increased every year, and more and more was done yearly in organisation, first of the Newnham Hall Company and then of other bodies, till the full college constitution was formulated (1880 and 1893), other halls, laboratories, &c. were built, the money being raised by gifts and subscriptions. At Girton the same process went on, and is going on still. The movement was much encouraged by the formal recognition gained from the University in 1881, when the famous Three Graces, admitting women of right to the Tripos examinations, were passed. Students from both Girton

¹ Concluded from p. 125. The Editors are indebted to the Editor of the *Cheltenham Ladies' College Magazine* for the use of the first illustration, to the Editor of the *Magazine of the Frances Mary Buss Schools* for the second and sixth, and to the Girls' Public Day Schools Company for the remaining portraits.

and Newnham had been allowed by the courtesy of examiners to take the papers, and their places had in general been made known: in 1880 Miss C. A. Scott, of Girton (now D.Sc. London, and professor in Bryn Mawr College, U.S.A.), was declared equal to the eighth Wrangler. This remarkable success, the first of its kind any woman had achieved, produced an extraordinary effect, and after various memorials had been presented to the University both from the colleges and outside, the Senate passed the Graces establishing the right of women to University recognition. Degrees were not granted. In 1887, and again in 1897 attempts were made to induce the University to carry its concessions to their logical conclusion, but the last showed the recent growth of a very strong feeling at Cambridge against giving women full rights, and the matter is now at rest for some time. Probably the question will solve itself with the development of the new local and civic universities (Wales, London, Birmingham, and, ere long, Manchester and Liverpool). In these women have not only the degrees, but a share in the government. The prominent place taken by women in the new London organisation, the part they are beginning to play in the northern colleges and Wales cannot but affect ultimately the older universities, possibly by limiting the numbers there to those who wish to do specialist work, and therefore by removing the possible danger of swamping with unwieldy masses of women students universities organised for men.

The story of the Oxford Colleges, Somerville and Lady Margaret (1879), St. Hugh's, and St. Hilda's, may be read at length in the textbooks on the subject. A Board of Studies ("the Association for the Education of Women") controls all the teaching there. Although the admission of women to the University examinations was tentative and by successive steps, everything is now open, and the Oxford college women, like the Oxford men, secure a large share in such public and professional appointments as are available. Our limits of space forbid any detailed account of other colleges, Bedford (1848), Westfield (1882), Holloway (1887), working for London degrees, the new Universities, like Wales and Birmingham, the recent opening of the Scottish degrees, the position of women in the Colleges of Victoria University in the north, &c., &c. It should be noted, nevertheless, that the idea of a special university for women, popular among certain friends of the movement, though disliked by the women leaders themselves, received its *quietus* at a conference called by Holloway College about 1897.

Miss Clough remained the head of Newnham until her death in 1892: her long tenure, her devoted earnestness, and the peculiar beauty and force of her character, established there a certain tradition, one note of which was the ideal of social work for the community in one form or another. The women trained under her at Newnham have had a marked share in the later developments of the movement we are considering, such as the training of teachers. Miss Hughes, one of her

students, beginning the Cambridge Training College in 1885.

As Mrs. Sidgwick succeeded Miss Clough, was on the Royal Commission for Secondary Education,



Mrs. Sidgwick.

and is one of the women members of the Consultative Committee, it may be as well to quote some of her published opinions on the question of University Education:—¹

Let me for a moment repeat what I am urging: it is that girls should be brought up to feel that, unmarried or married, it is their duty to the world to make the best use of the talents—taking talents in the widest sense—which Nature has given them; and to this end care should be taken that they have the amplest opportunity of developing their capabilities—their real capabilities, not those which it is artificially assumed they possess.

And I plead for this, not only because all human beings ought to be working together for the good of the whole, but for the sake of the happiness of women themselves, who are not only half the human race, but the half on whose health and happiness the well-being of future generations probably most depends. . . .

I think, then, that women should just as much as men propose to themselves a definite branch of work—not necessarily remunerative work—and prepare for it when they are young.

It would be impossible to live in a college, as I have done, without realising that, whatever has been gained for women by the work of the last thirty years, the happiness springing from free and unconstrained intercourse with congenial companions, from the sense of membership of a community with large interests and high aims, from pleasant memories and from lasting friendships, is no small part of it.

We have now to enlarge somewhat on the first

¹ Transactions of the Women's Institute, No. 1.

and second of Mr. Bryce's recommendations, those relating to the establishment of public schools for girls and to the improvement of the curriculum. These have gone together, influenced by and in-



Miss Shirreff.

fluencing the growth of the women's colleges. The high schools of the Girls' Public Day Schools Company (formed 1872), whose ideal is expressed in a phrase by H.R.H. the Princess Louise, their patroness, "a happy school life combined with a happy home," and whose motto is "Knowledge is now no more a fountain sealed," have obviously had much to do with the revolution in English girls' education. Among the first directors were Mrs. William Grey, Miss Shirreff, and the Dowager Lady Stanley of Alderley. The schools are first grade, the education corresponds to that given



The Dowager Lady Stanley of Alderley.

to boys in the great public schools, the average fee being about £15. In 1900 they had 33 schools with 7,000 scholars, Kensington and Notting Hill being among the oldest. We may quote from an official pamphlet: "In the high schools physical

training and the development of corporate life have gone hand in hand with study." "The leading aim throughout is the training of the character with a view to conduct and preparation for the duties of life."

The history of the Ladies' College, Cheltenham, has been written by Miss Beale herself: its *differentials* are the social discrimination implied in the title, the fact that the girls are largely boarders, and the combination of all the forms of education, kindergarten, primary and secondary, higher, technical (training of teachers), in one institution under one head.

But about 1875, of the girls' schools the most significant, and in some respects the most interesting and important, were those founded by Frances Mary Buss, which now bear her name. There the type of the girls' high schools was



Mrs. W. Grey.

evolved, there began the struggle for a public status, like that of St. Paul's and other great schools for boys, and for a fair share in those endowments the increase of which with the increase of wealth and population made possible an adequate provision of the much-needed buildings and scholarships for girls. There, too, was set the example of how to solve the problem of the second-grade school, the school for the numberless girls of the poorer middle-class who needed, (and in many places, alas, still lack,) sound education within the reach of their parents' limited means (fees £4 to £6). The Company's schools could do nothing here: endowments only could make such a scheme possible, and in the Camden School, the Roan School at Greenwich, many other London schools since reformed, and some few elsewhere, has been provided a type of education far superior to that of the higher-grade schools, and destined perhaps to be the model for many schools to be set up under the new Education Acts. Miss Buss's sound common-sense and deep sympathy for the struggling girls who had hitherto sought in vain to cultivate learning on a little oatmeal, instinctively found the right solution, and much of

the best work done in this connection is due, directly or indirectly, to her. In her *Life* by Miss Ridley, the inspiring story of the great struggle, well remembered by many still with us, is told at length: "We must *do*, and *do* and *do*," she said. At last, in 1872, the endowment from the Brewers' Company came, and in 1875 the scheme establishing the schools for ever was signed by the Queen in Council. What Mrs. Bryant says later is true indeed: "In 1875 the future of women was, I believe, much more certain than it appeared."

Since then there has been no retrogression. The same tale of hard-won public status and endowment is told in the Reports of the Manchester High School, opened in 1874, when the Governors state:

The special merit and claim (of the school) lie in the security offered by public governors and an independent and frank yearly report (by a university), and in the moderation of the terms on which such high education is offered. They say, further, that such a school for girls has become manifestly a requirement of the times in all large towns, that women's interests in education have hitherto not had justice and fair play.

One of the founders, speaking in 1892, says: "The only true history of a school is that which is written in the lives of those who have been trained in it." "The school puts before every girl in this vast community the chance of a thoroughly sound education that may fit her for whatever duties lie before her." The scheme for this school was signed by the Queen in 1884, the endowment coming from the Hulme Trust. The Governing body is largely representative of local authorities, colleges and universities. Bradford, Birmingham, Bedford, Ashby de la Zouch, Salisbury, Bristol, and other places where ancient endowments exist have also applied these under similar schemes to the provision of girls' schools, both first (high schools), and second grade. In many boroughs and districts, however, much still remains to be done in this direction, *e.g.*, in Salford, Dorsetshire, and Macclesfield.



Mrs. Bryant, D.Sc.

Just as Mrs. Sidgwick is carrying on the work begun by Miss Clough, so Mrs. Bryant has become since Miss Buss's death, in 1894, a representative of women's progress in secondary education. A distinguished student of Bedford College in the later 'sixties, she began in 1875 to teach mathematics in Miss Buss's school, and her work there

had a marked effect in widening and strengthening the curriculum and in stimulating work for college. This kind of influence was felt, as we have observed, in many girls' schools, as soon as the women who had received university training began to pass into them. With this generation, too, it was evident that the whole educational problem was what these women lived for, and they therefore came to have a reflex influence in the whole field, and helped to improve education generally. Mrs. Bryant's work on the London Technical Education Board, a type of the new local authorities of the present Bill, and in the reorganised London University, may stand as examples of what is being done everywhere, for the community as a whole, by women trained in the high schools and colleges. The Headmistresses' Association, 1874, and the Teachers' Guild, 1883, were founded by Miss Buss, and the ideal of professional training for teachers was furthered by the opening of the Maria Grey Training College in 1878, largely through Mrs. William Grey and Miss Shirreff.

The college women have also introduced games and careful physical training into the curriculum, not only on hygienic but on moral grounds, as may be seen in the writings of Miss Soulsby and Miss Dove ("Work and Play in Girls' Schools"). With this has come the evolution of the new type of boarding school, somewhat resembling the public schools for boys, the model being St. Andrew's, which has always been largely officered from Girton.

There is considerable difference of opinion as to curricula among headmistresses at present, though all recognise, to some extent, classics and mathematics. In some schools experiments are being made in organised teaching of the domestic arts as a training for home duties; some make Latin or mathematics almost compulsory; the proportion of scientific and literary studies varies much in different schools. Miss Beale advocates a broad basis of—

general culture, which appears to me more suitable for most women: a varied curriculum tends to develop the wider sympathies, the many-sided interests which enable a woman to carry on the multifarious occupations of the ordinary home life, and prepare her to take her place in cultured society.

Mrs. Bryant holds to the same principle, as may be seen in her pamphlet "The Secondary Education of Girls" (Women's Institute). But whatever may be the wholesome variations or the useful experiments made by the present generation of workers, they remain true to the old ideals enunciated fifty years ago. As Mrs. Bryant has said recently, "the ideal of education is a harmonious and healthy development of mind and physical power, in relation to knowledge, to the practical purposes of life." "Women are wanted in the schools, no less than in the homes, as indeed they are wanted in every sphere of social work, not because they can compete with men by bringing the same qualities either in greater or less degree, but because they supplement men by bringing other qualities."

SOME SUGGESTIONS FOR TEACHING MENSURATION AND SURVEYING.¹

By S. DE BRATH, M.Inst.C.E.

Headmaster of Preston House School, Bookham.

I.—MENSURATION.

A FEW simple experiments in most schools will reveal that behind the fluent working of set geometrical propositions and algebraical problems there is little or no grasp of the concrete nature of geometrical forms. Mathematical work is too often entirely severed from life, and almost entirely severed from common sense. I appeal to the experience of mathematical masters whether it is not frequently true that boys contentedly show up results glaringly at issue with common sense, because, forsooth, "it comes out so."

The value of applied mathematics, such as mensuration, in a liberal education is to restore the connection with life; and that this restoration may be effective, the application must be both philosophical and "common-sensical." Alas for the philosophy which makes issues with common sense! To restore this connection we must not aim in our applied mathematics at the acquisition of another highly formalised branch of the study—complicated rules for dealing with frusta of pyramids and cones, sectors or circles, and volumes of annular bodies—nor yet at imperfect familiarity with a mechanic art like land surveying; but at an intelligent application of principles which are seen by the learner as having not merely a use in practice with which he is possibly not concerned, but also a basis in that essence of things which interests every intelligent mind. To oblige a boy to "get up" mensuration and surveying is but to heap another burden on the already over-examined and aggrieved school-boy; to make him intelligently familiar with the application of principles he already knows is to help him to realise the vital connection of mathematics with the living outside world. The English mind is nothing if not practical, and in point of fact boys do take kindly to these applications of mathematics and perceive that there is a practicality of understanding as well as of utility.

In view of the unsuitability of purely technical subjects for examinations intended as tests of liberal education, and of the fact that no school course can give more than the merest smattering of surveying considered as an art, we may, perhaps, assume that some such considerations of the value of applied mathematics as the foregoing have influenced the recent decision to include Mensuration and the Elements of Surveying in the list of subjects for the Senior Cambridge Locals. The remarks which follow are based on this supposition.

That this purpose may be served we must studiously

avoid mere bookwork. We must provide instruments—few, and those few of the simplest kind—but the work must be done by actual measurement, and not by merely reading and writing about measurement. From actual measurement should emerge the radical difference between empirical and exact mathematics—that every measurement, however delicate, is an approximation, whereas reasoning is exact; and we may then hope to provoke that action and reaction between concrete and abstract ideas which is living knowledge, whether of mathematics or of aught else.

I assume the student to be provided with:—

A set of ordinary drawing-instruments, small drawing board, 45° and 60° set-squares, and T square (12s. 6d. in all).

A boxwood rule graduated in inches and tenths, and centimetres and millimetres (1s.).

An ivory diagonal-scale and protractor (1s. 6d.).

A pair of common inside and outside callipers (1s.), and also to have available when necessary:—

A simple straight vernier, in boxwood (4s. 6d.).

A simple circular vernier, in boxwood (7s. 6d.).

A side calliper reading to 0·1 mm. (15s. 9d.).

A set of geometrical models and materials for measurement may be added if desired. They are useful.

The cost of this outfit would be about £2 10s. in all.

The drawing instruments should be few but good, including one set of dividers with needle points. The whole outfit is obtainable almost anywhere, but Messrs. Griffin & Sons, 26, Sardinia Street, W.C., supply excellent instruments of the exact pattern required.

Let us now glance at some of the principles which have to be grasped and applied in order to perceive the new extensions which naturally proceed from them.

"To measure" is to ascertain the ratio between the unit and the object to be measured. The ratio may be a ratio of lengths, areas, masses, volumes, weights, forces, angles, &c., &c.; it may be integral or fractional. When we find that a given rod is 6·24 inches long we mean that the ratio of the bar to one inch is 6·24, or that the unit can be repeated 6·24 times along the bar. First comes the realisation of the common and metric units—the yard and the metre and their sub-multiples—not by description but by actual use of the yard and metre rods. The direct application of these to given objects will show

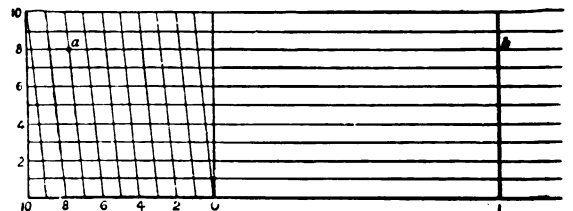


FIG. 1.—A Diagonal Scale.

that only very rough approximation is possible; a class measuring identical objects such as slips of note-paper will differ by as much as

¹ A new section including Mensuration and Surveying has been added to the Syllabus for Senior Students in the Cambridge Local Examinations, December, 1902.

2 or 3 mms. or even $\frac{1}{4}$ inch: even when careful, by 1 mm or $\frac{1}{32}$ inch. The use of the diagonal scale for more accurate measurement follows. The form shown in Fig. 1 is most suitable. A little consideration will show that the length $a-b$ is 1.78 inches. Practice in using the instruments to determine given and uniform lengths, thicknesses, and diameters of coins, and the like, should be given till some skill is attained, and before further progress is attempted.

The use of the vernier, employed on most barometers and in delicate measuring instruments, slide callipers, sextants, theodolites, &c., follows. The principle of the vernier, that each scale division is $\frac{1}{10}$ th, or some fixed fraction larger than each vernier division, that the vernier scale is made by taking $(n-1)$ divisions of the main scale and dividing this into n parts to make the vernier, having been fully and practically brought out, and verniers drawn on card, the students can proceed to remeasure the lengths previously measured by direct application and by the diagonal scale. The increased accuracy will be manifest.

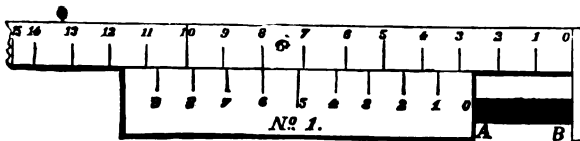


FIG. 2.—The Vernier.

A good form of vernier is that shown in Fig. 2, the divisions being centimetres. In the figure the rod AB measures 2.6 cms.

The slide callipers (Fig. 3) need no special explanation here. Their use is obvious from the foregoing.

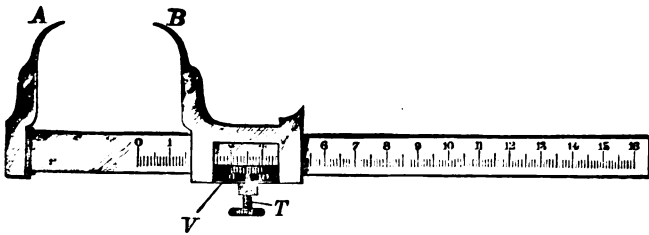


FIG. 3.—The Slide Callipers.

When a boy has learned practically to use these simple instruments well, the preliminary part of his course is complete. It remains to blend concrete and abstract. The mathematical principles to which the skill gained is to be applied are: the principles of geometrical fourth, and mean, proportionals (based on Euclid i. 47, iii. 30, and vi. 2), and the proposition that the length of circumference of any circle is $2\pi r$; bringing out the nature of incommensurable quantities.

The mensuration of plane areas may follow with advantage, and the following facts should appear clearly at the outset:

- (1) That the unit is a small plane surface;
- (2) That this surface is directly derived from the unit of length; and
- (3) That, though primarily square, it may be an area of any shape.

I lay stress on these very simple matters because very many boys do not as a matter of fact realise that "an inch" is not and cannot be a unit to measure areas. From this and other original misconceptions a host of difficulties arise.

The abstract mathematical principles to be united to these will be the geometrical and trigonometrical propositions which connect the areas of plane figures with the lengths of sides and perpendiculars. These figures arranged in their natural order will be the square, rectangle, parallelogram, triangle, trapezium, polygon and circle. The areas of these, computed by practical measurements of sides, will combine the mathematical theory and the practical skill. Exercises for examination may either supply the measurements or pre-suppose the possession of instruments and the ability to use them. I would suggest that the latter is incomparably the more valuable test than mere paper work.

From the plane surface we may proceed to the solid, bringing out as before that the only possible unit for measuring volume is a small unit of volume, that this unit is derived from and dependent upon the unit of length, and that the natural reason for the rule which multiplies the number expressing the height into those which express the two other dimensions, follows from physical spaces available for the unit volume. The natural sequence resembles that of planes—it is the cube, brick, prism, and cylinder, the pyramid and cone, the sphere and the ring. Some additional work on the limit of allowable error and the practical accuracy required in any given measurement may complete our course of mensuration. This should suffice. It would be easy to expand it indefinitely, but I would strongly deprecate the too usual encyclopædic completeness of our mathematical courses, advocating thorough grasp instead.

An abundance of examples for working will be found in "Elementary Mensuration," by Mr. F. H. Stevens, M.A., and valuable assistance can be gained from "Practical Mathematics for Beginners," by Mr. Frank Castle, M.I.M.E., both published by Messrs. Macmillan. Both are considerably more copious than is perhaps desirable in the treatment of the subject from the point of view taken up in the present article, but both will be found full of useful matter readily adaptable to the scheme indicated above.

A set of geometrical models such as Messrs. Griffin and Sons supply are very useful for working out the relations between linear, superficial and solid dimensions.

(To be continued.)

BALANCES FOR THE LABORATORY AND LECTURE ROOM.

By H. E. HADLEY, B.Sc.(Lond.), A.R.C.Sc.
Headmaster of Kidderminster School of Science.

THE recent rapid growth of Experimental Science as a school subject has resulted in the introduction, by manufacturers and dealers, of a vast quantity of simple apparatus, which, owing to a diversity in detail and cost, creates some difficulty in making the most advantageous selection for laboratory and lecture purposes. Formerly, experimental work by junior classes was restricted to qualitative observations, but, in more recent years, experiments of a quantitative nature have been widely introduced, and the balance has consequently become an essential item even for students who are quite beginners.

This article is written to suggest the principal points which should be considered when selecting balances from the numerous types now available. In any laboratory the balances should be numerous and of good quality; even in cases where funds are strictly limited good balances should be regarded as essential, even to the neglect of other items of equipment. It is equally important that the class-room should be provided with a special type of demonstration-balance, equipped for a diversity of experiments, which may be readily observed by students at a distance from the table.

BALANCES FOR THE LABORATORY.—The chief points to remember in selecting a suitable balance for elementary students may be stated separately: (i.) The mechanism of the balance should be designed so that it is difficult for the student to throw it out of adjustment. (ii.) The *sensitiveness* (which may be roughly defined as the minimum weight which will cause an appreciable deflection of the pointer) need not be much greater than the average accuracy of the experimental work done by the students; for example, beginners cannot be expected to obtain results nearer than 3 per cent. or 4 per cent. of the theoretical result, so that, if the minimum weight or difference of weight which they are expected to determine is 0.5 gram, it will be sufficiently accurate if the balance permits them to weigh to the nearest centigram. In such cases a balance sensitive to two or three milligrams is amply sufficient. Again, any slight draught (from which no room is quite free) will often produce a greater disturbance of the balance than would a weight of several milligrams; consequently, a weighing to a greater accuracy than the nearest centigram can scarcely be relied upon unless the balance is protected by a cover with glass front. A balance for elementary work, therefore, need not be sensitive to less than two or three milligrams, a condition which may readily be obtained with a balance constructed to carry 200 grams in each pan (a total weight which is frequently required in practical work). (iii.) The suspension for the pans should be provided with a hook from which objects may be suspended without interfering with the freedom of the knife-edges. (iv.) The brass

hoops carrying the pans should be amply wide so as to allow the weighing of fairly large flasks and beakers.

The beginner always seems to, and probably always will, find it easy to throw the beam of a balance out of its proper place, and to displace the stirrups from their bearings; also, he apparently finds it equally difficult to detect these mistakes

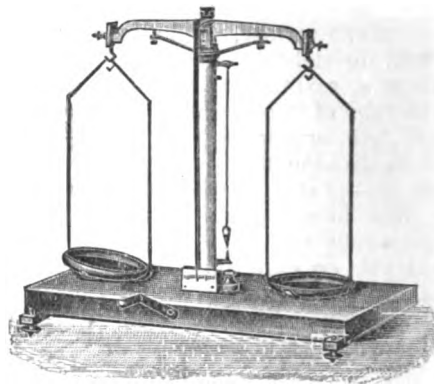


Fig. 1.

himself. Some types of balance are frequently thrown out of adjustment when a mass is attached to the hook under the stirrup, unless a heavier mass is placed on the opposite pan (although, of course, a more frequent cause is the careless changing of weights while the beam is free). A simple balance, suitable for beginners, should, therefore, be provided with a beam support (Fig. 1)¹, or a beam arrestment (Fig. 2)², and these should

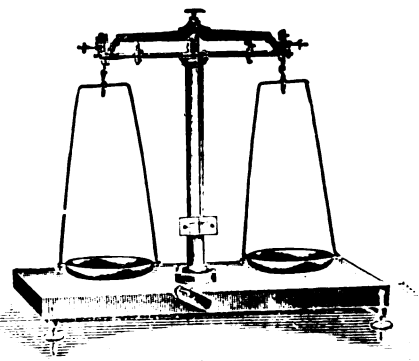


Fig. 2.

serve the purpose of automatically bringing the beam back into its normal position when the balance is thrown out of action. Fig. 2 also indicates arrestments for the stirrup suspenders which bring the latter back to their normal positions. Both of these balances are made sensitive to one

¹ W. & J. George, Ltd., 33, Hatton Wall, E.C. Catalogue No., 5000; price £1 9s. 6d. (to carry 100 grams), or £1 12s. 6d. (to carry 250 grams).

² J. J. Griffin & Sons, Ltd., 20-26, Sardinia Street, Lincoln's Inn Fields, W.C. No. 5581, price £2 4s. (to carry 100 grams), or £2 7s. 6d. (to carry 250 grams). A simpler form (No. 5377) with beam-support only is catalogue at £1 4s. (to carry 100 grams).

milligram, and are therefore quite good enough for the use of elementary students.

The advantage of agate knife-edges and planes is sometimes over-estimated, but they are essential

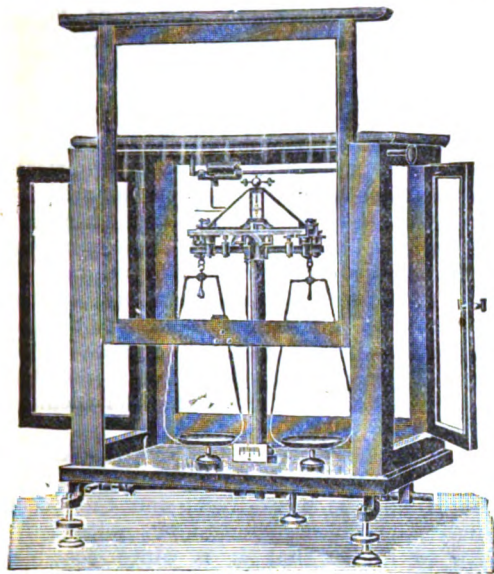


Fig. 3.

unless the instruments are protected from acid-fumes and damp. Steel knife-edges and planes will be found quite sufficient if the balances are kept in a properly equipped balance-room, and if the steel parts are occasionally rubbed with a piece of old cambric (slightly oiled).

A more accurate type of balance is required by students who are doing quantitative work of a more advanced type. For such purposes the balance may be selected from a wide range of instruments varying in price from £7 to £18 or £20, the selection depending entirely upon the quality of the work which is to be done. For general laboratory work "short-beam" balances are now more usually adopted; the "Bunge" type (Fig. 3)¹ can be strongly recommended, and can be purchased through most apparatus dealers.

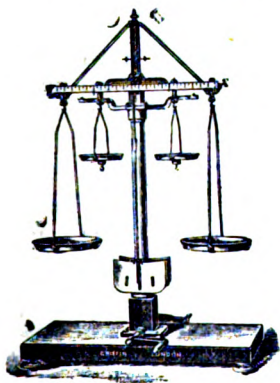


Fig. 4.

¹ This illustration is from the catalogue of Messrs. Philip Harris & Co., Edmund Street, Birmingham. A Bunge balance, to carry 100 grams and sensitive to $\frac{1}{10}$ milligram, is catalogued at £9 10s.

WEIGHTS.—Experience seems to indicate that, for elementary work, a set of weights ranging from 100 grams to 5 milligrams is sufficiently complete. Such sets may be purchased at a price varying from 5s. 6d. to 8s. 6d., according to the accuracy of adjustment. In many sets, the fractions are made of thin, flat pieces of metal with one edge turned up, which is very liable to be broken off with rough treatment. A more satisfactory form of the fractions is obtainable in which each weight consists of a cushion-shaped piece of thick aluminium.

BALANCES FOR THE LECTURE-ROOM.—A special type of balance for demonstration purposes is almost essential, since the laboratory type is too small and its range of experimental work is too limited. A demonstration balance should have a scale and pointer visible to a large class, and additional appliances for the weighing of gases, for the law of the simple lever, and for the demon-

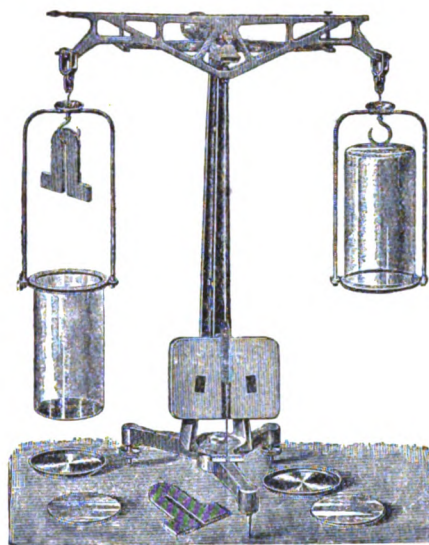


Fig. 5.

stration of the conditions which determine the sensitiveness of the balance.

Fig. 5¹ represents a very useful type, which readily carries 1 kilogram in each pan, when it is sensitive to 1 centigram. This balance has a convenient arrangement for weighing gases: the pans are supported by circular rings, which also serve to support the glass cylinders and cover plates supplied with the balance; these cylinders have a capacity of about 1 litre, and may be used with equal readiness in either the upright or the inverted position. The knife-edges are 41 centimetres apart, and the centre knife-edge is 60 cms. above the table. The arrestment is manipulated by a milled handle behind the central knife-edge.

Fig. 4² represents a pattern which has peculiar

¹ This pattern may be obtained from Messrs. A. Gallenkamp & Co., 19, Sun Street, Finsbury Square, E.C.; catalogued at £8 2s.

² To be obtained from Messrs. J. J. Griffin & Sons, Ltd., price complete, £9.

advantages. The beam has two pointers, each bearing a sliding weight, by means of which the centre of gravity of the beam may be moved in order to vary the sensitiveness. The balance is constructed to carry 5 kilograms in each pan, and is then sensitive to 1 centigram. The length of the pointers may also be varied. The beam is fitted with a rider-scale divided on front and back, and has two pairs of knife-edges, the inner edges being midway between the outer and central knife-edges. The distance between the outer knife-edges is 48 cms., and the entire balance is 110 cms. high. The balance is constructed to carry out experiments on (1) Variation of Sensitiveness by means of the sliding weights on the pointers, or by raising the plane of the knife-edges, (2) the Laws of the Simple Lever, (3) Specific Gravities and Densities, (4) Cohesion.

HISTORY OF GREEK PHILOSOPHY.¹

BOTH these books were compiled as a selection of authorities, to be used by those who attended the lectures on elementary philosophy which are now a necessary part of the Classical Tripos. We may be allowed first to express our gratification that the examination has been widened so as to take in such a course of study; and secondly, our admiration for the skill and judgment shown in the selections. Students will find Dr. Jackson's book none the less interesting than he has selected from Plato with a view to supporting certain theories of his own; for the rest, most of the pieces are familiar enough, and may be found in Ritter and Preller, or cited by Zeller in his "History of Philosophy." But Ritter and Preller is too technical a work to be useful to the non-specialist; and it contains too much for the beginner. Both these little books are well suited for the beginner. Dr. Jackson's book has the advantage over Mr. Adams', that his subject is more fresh and fascinating. There is something to fascinate in all the early Greek speculations, and even the most foolish are apt to contain some point of a great principle: no book can be dull in which Thales, Heraclitus, Empedocles, and Democritus speak for themselves. Mr. Adams, although he can boast of no such great names, has at least themes of perennial interest in Epicureanism and Stoicism. One word may be added on the general plan, which is the same in both works. A section is devoted to each of the philosophical systems or schools, a few introductory quotations being followed by the life and theories of each of the chief figures in that school. After Aristotle, when the person becomes of less importance and the philosophical system of greater importance, the different departments of philosophy are treated more in detail.

¹ "Texts to Illustrate a Course of Elementary Lectures on the History of Greek Philosophy from Thales to Aristotle." By Henry Jackson. xi. + 111 pp. (Macmillan.) 5s.

"Texts to Illustrate a Course of Elementary Lectures on Greek Philosophy after Aristotle." Selected and arranged by J. Adams, Fellow and Senior Tutor of Emmanuel College, Cambridge. viii. + 70 pp. (Macmillan.) 3s. 6d. net.

THE ESSENTIALS OF BRITISH HISTORY.

AS EXTRACTED FROM THE PAPERS ON GENERAL BRITISH HISTORY SET 1888-1901 FOR THE SCOTCH LEAVING CERTIFICATE EXAMINATION.

By J. S. LINDSEY.

SHORT special periods in History are being attacked nowadays in many quarters on educational grounds; but, on the other hand, schoolmasters very naturally fear the prescription of long periods, because, if injudicious questions be set on minutiae, a recourse to sheer cramming will become necessary. It has, therefore, struck me that it might be worth while to analyse the papers set on General British History at one of the best managed of all school examinations in the United Kingdom—the Scotch Leaving Certificate Examination.

This is the only school examination known to me in which so wide a historical subject as General British History is prescribed; and the result of my analysis exhibited below shows quite clearly, I venture to think, that it is quite possible for examiners to set sensible questions in History which require an intelligent grasp of the main facts and not laborious memorisation of out-of-the-way details. This table shows practically all the subjects (except reigns and characters of English kings since the Norman Conquest) on which questions have been set in British History in the fourteen years during which the Leaving Certificate Examination has been in existence.

There is hardly a topic entered below which it is not reasonable to expect an educated British man to be acquainted with; but, in point of fact, as a very considerable choice of alternative questions is offered (a most important thing), no candidate is expected to know all these things.

The general type of paper set in recent years is admirably exemplified in the test papers printed in the March number of *THE SCHOOL WORLD*. The topics set forth synoptically on the adjoining page are sufficiently varied to afford plenty of scope to teachers who are more concerned to train the mind than to stock it with facts. Hence I suggest the following general questions as worth asking about each of the subjoined entries (p. 173):—

A. PERSONS.—Who was he? What was he? When (about) did he live? With what other notable persons was he brought into contact? What did he try to do? What did he succeed in doing? Why was he important either in his own day, or for what he did for you and me?

B. PLACES.—Where is it? What took place there? during this period or later? Why did it take place there? Why is the place or its historical associations important in British history?

C. TERMS.—What does the term literally mean? What is its particular meaning and significance at this period?

Caution (in the Department's words). *Mere lists of events and dates will not be regarded as sufficient.*

GENERAL BRITISH HISTORY: TOPICS SET AT SCOTCH LEAVING CERTIFICATE
EXAMINATION, 1888-1901.

I. To 1066.

A. PERSONS.

Agricola
Alfred
Augustine
Columba
Dunstan
Edgar
Edward the Confessor
Edward the Elder
Ethelred the Unready
Godwin
Harold
Kenneth McAlpine

B. PLACES.

Chippenham
Galloway
Lothian
Senlac
Strathclyde
Wedmore
Whitby

C. TERMS.

Danegeld
Danelagh
Heptarchy
Roman Roads
Witenagemot

III. 1327-1485.

Albany
Beaufort
Bedford
Cade
Chaucer
Elizabeth Woodville
Humfry of Gloucester
Joan of Arc.
Margaret of Anjou
Tyler
Wyclif

Agincourt
Anjou
Bosworth
Bretigny
Creçy
Guienne
Halidon Hill
Harlaw
Normandy
Orleans
Troyes

Benevolences
Black Death
Forced Loans
Hundred Years War
Lollards
Merciless Parliament
Peasants' Revolt
Praemunire
Provisors
Statute of Labourers
Wars of the Roses

V. 1603-1680.

Bacon
Blake
Cromwell
Fairfax
Hampden
Laud
Monk
Montrose
Pym
Strafford

Berwick
Cadiz
Dunbar
Hampton Court
Naseby
Philiphaugh
Rochelle
Worcester

Barebones Parliament
Cavalier
Civil War
Commonwealth
Grand Remonstrance
Impositions
Long Parliament
National Covenant
Petition of Right
Pride's Purge
Self-denying Ordinance
Ship money [nant
Solemn League and Cove-
Spanish Marriage
Thirty Years War
Thorough
Tonnage and Poundage
Westminster Assembly

VII. 1756-1815.

Burke
Chatham
Clive
Fox
Hastings
Nelson
North
Pitt
Wellesley
Wellington
Wilberforce
Wilkes

Corunna
Nile
Nore
Plassey
Pondicherry
Quebec
Quiberon Bay
St. Vincent
Salamanca
Saratoga
Versailles
Waterloo

All the Talents
Declaration of Indepen-
First Coalition [dence
First of June
Gordon Riots
India Acts
Middlesex Election
Napoleonic War
Ninety-eight
Peninsular War
Regulating Act
Slave Trade
Stamp Act [pendence
War of American Inde-

IX. Supplementary: General Terms.

Budget
Cabinet Government
Cinque Ports [chy
Constitutional Monar-
Democratic Reform
Direct Taxation
Court of Chancery

Divine Right
Educational Re-Parliament
Estates [form
Feudalism
Franchise
Freedom of the Press
Free Trade
Imperial Federation
Presbyterian
Privy Council
Protection
Religious Tests
Royal Prerogative

II. 1066-1327.

A. PERSONS.

Anselm
Becket
Bruce
David I.
Hubert de Burgh
Lanfranc
Langton
Maid of Norway
Malcolm Canmore
Margaret
Montfort
Red Comyn
Robert I.
Strongbow
Wallace

B. PLACES.

Amiens
Bannockburn
Bouvines
Clarendon
Evesham
Kenilworth
Lewes
Oxford
Stirling

C. TERMS.

Assize of Clarendon
Barons' War
B. of the Standard
Confirmatio Cartarum
Constitutions of Clarendon
Crusades
Domesday Book
Friars
Great Charter
Investitures
Magna Carta
Mise of Amiens
Provisions of Oxford
Town Guilds
Trade Guilds

IV. 1485-1603.

Burleigh
Cranmer
Cromwell
Darnley
Drake
Jane Grey
Knox
Mary of Guise
Mary, Queen of Scots
More
Pole
Raleigh
Sidney
Simmel
Warbeck
Wolsey

Drogheda
Flodden
Langside
Rome
Solway Moss
Trent

Armada
Babington Plot
Desmond Rebellion
Dissolution of Monasteries
First Covenant
Gowrie Plot
High Commission
Lords of the Congregation
New World
Pilgrimage of Grace
Poor Law
Puritanism
Reformation
Star Chamber
Supremacy Act
Uniformity Act

VI. 1660-1756.

Bolingbroke
Clarendon
Claverhouse
Danby
Marlborough
Peterborough
Sacheverell
Shaftesbury
Walpole
Wesley
Young Pretender

Aix-la-Chapelle Act of Settlement
Blenheim
Bothwell Bridge
Boyne
Culloden
Darien
Gibraltar
Glencoe
Killiecrankie
Londonderry
Rye House
Utrecht
Worms

Claim of Right
Conventicle Act
Covenanter
Declaration of Right
Drapier's Letters
Exclusion Bill
Five Mile Act
Habeas Corpus Act
Jacobite
Mutiny Act
Revolution
Seven Bishops
South Sea Bubble
Spanish Succession
Test Act
Toleration Act
Union

VIII. 1815-1900.

Beaconsfield
Bright
Brougham
Canning
Gordon
Grey
Huskisson
O'Connell
Palmerston
Peel
Russell

Adelaide
Aden
Balaclava
Cabul
Candahar
Khartoum
Lucknow
Sebastopol
The Hague
Tientsin

Ballot Act
Catholic Emancipat'n Act
Chartism
Corn Laws
Crimean War
Factory Acts
First Reform Act
Holy Alliance
Indian Mutiny
Municipal Reform
New Poor Law
Peace of Paris
Slavery

HINTS FROM RECENT EXAMINERS' REPORTS.

I.—CAMBRIDGE LOCAL EXAMINATIONS, 1901.

THE reports of the Examiners in the Cambridge Local Examinations of December last, contained in the "Forty-fourth Annual Report of the Syndicate" now published, as usual provide teachers with much useful information as to which parts of the different subjects give pupils the greatest difficulty. In the following abstract attention is alone given to definite failings which may, with the exercise of due care, be avoided in the preparation of candidates who will take the Examinations this year.

COMPULSORY SUBJECTS.—In *Arithmetic* the preliminary candidates often failed where the method needed description or where a little thought would have prevented grave mistakes. The chief defect among the juniors was the unnecessary reduction of decimals to vulgar fractions, and the employment of the latter instead of the former in the question on decimal coinage. The waste of labour due to not using decimals was, in the answers of the seniors, "grievous," to use the Examiners' expression.

ENGLISH SECTIONS.—The preliminary papers in *English Grammar* showed that the great majority of the candidates were unable to distinguish between the functions of the adverb and those of the conjunction, and few gave a complete description of a present participle. In picking out *subjects* and *objects* from eight lines of poetry a very large number of candidates did not differentiate between *objects* and *objective cases*. The parsing of verbs by the juniors and their answers on verb forms were rather weak, and there was great uncertainty as to the proper position of inverted commas.

The commonest faults in the *Composition* of the seniors were these:—A tendency, especially among the girls, to write for the full allotted time without pause or thought; neglect to take the allotted time into account, in consequence of which many essays were unfinished; the lack of conception of the subject *as a whole*, shown in disconnectedness and misplacement of parts; the dragging in at any cost of a closing quotation.

The fulness and accuracy with which questions involving a knowledge of biographical details and of military or naval events were answered by the junior candidates in *English History*, as compared with the treatment of constitutional and political questions, seemed to show that a disproportionate stress had been laid by teachers on these parts of the subject. The question dealing with the inventions of the second half of the eighteenth century produced a great deal of confused writing. It was clear from the work of even the best candidates that this part of the subject had been almost entirely neglected. It is to be regretted that the practice of learning by heart answers to probable questions is apparently on the increase. This mechanical method of study accounts for the juxta-

position in the same paper of answers marked by carefully worded sentences and others defective in both style and grammar.

A question; in the junior *Geography* paper, concerning commerce between Great Britain and Ireland, elicited few good answers. The part of the paper requiring general knowledge of geography was very inadequately treated, even good candidates writing vaguely and inaccurately about the position and special interest of important places. A noticeable defect was the failure to apprehend the extent of great continents, places being simply stated to be "in Africa" or "in South America"; the unintelligent use of maps in this respect should be checked by attention to the parallels of latitude, by observation of the length of rivers and coast-lines, and by reference to some familiar standard of comparison, such as the British Isles.

Far too many of the senior answers in geography made it plain that the subject had not been studied by methods which appealed to the intelligence as well as to the memory. This was clearly revealed, first, in the maps of the north of England, and secondly, in the answers to some of the simpler questions such as that relating to Siberia (or its alternative, Persia). Thus names of rivers, heights, etc., were often inserted in the maps in needless profusion and quite at random, while no attempt was made to indicate the physical features which give direction to the rivers or facilitate communication between opposite sides of the country. Similarly, too often a mere enumeration of names was offered as a substitute for a description. It ought to be borne in mind that the distribution of highlands and lowlands, apart from mountain ranges and well defined plains, is an important feature in the physical structure of a country. Among the questions least satisfactorily answered was that on the monsoons.

CLASSICAL SECTION.—The chief faults in the junior *Latin* papers were confusion of the Latin conjunctions, sentences without any complete construction, the redundant use of "and" and "he," and lapses into loose paraphrase. The parsing often showed a lack of thoroughness and method; many of the candidates omitted important details. The maps for the Cicero paper were as a rule poor. Some knowledge of scansion was shown by most of those taking the Virgil paper; but in many cases scansion did not seem to have received sufficient attention. Many who got good marks for their knowledge of irregular verbs made havoc of the future of *sequor*. The unprepared passages of ordinary difficulty were attempted by many candidates who could have no hope of gaining the mark of distinction and little likelihood of obtaining a single mark. The answers to questions on syntax were not satisfactory. The number of good prose compositions was small. In the senior papers the declension of nouns and adjectives was conspicuously weak.

In the junior *Greek* very many of the papers on Book VI. of Xenophon's "Anabasis" showed complete disregard of the constructions and punc-

tuation of the original; tenses, moods, cases, and conjunctions were too frequently ignored. The questions on constructions were poorly answered. Not half-a-dozen boys knew the date and starting-place of the expedition, or its duration, and too few knew its object. The work as a whole in unprepared translation pointed to the need of a more careful teaching of constructions and a greater insistence on literal translation in class. Most of the candidates attempted the syntactical questions, but few with much success.

MODERN LANGUAGES SECTION.—The *French* reports contain few definite hints, though it is remarked that numerous senior candidates failed to observe some of the most elementary rules of French syntax. Those seniors who took unprepared translation showed, on the average, more intelligence than those who had prepared the set books.

In *German* the weakest point in the preliminary papers was the *accidence*. Extremely few of these candidates showed a satisfactory knowledge of the inflexion of adjectives, of ordinary pronouns or numerals, or of the very commonest irregular verbs. The easy passage for composition proved a stumbling-block to nearly every candidate, and showed that in hardly any case had German been taught as a living and spoken language, and that scarcely any candidates had been accustomed from the beginning to speak and to write short and simple sentences in idiomatic German. The frequent confusion of the letters *s* and *z*, and of the unmodified and modified vowels, also gave evidence of an almost entire absence of attention to pronunciation.

In the *accidence* answers of the juniors there was in the declensions a great deal of guessing, and the translations of the shorter phrases were for the most part inaccurate. Too many senior candidates made wild guesses as to the meaning of words unfamiliar to them, and were misled by the apparent identity of German and English words. Their composition was very badly done. This failure shows grave defects in the method of teaching employed in many schools; great attention should be given to translation from English into German, if any competent knowledge of the language is to be obtained. Complete ignorance of the most elementary rules of syntax and of the simplest words was frequently exhibited.

MATHEMATICAL SECTION.—In the *Euclid* papers of the preliminary candidates the definitions of *Euclid* were seldom well given. The Examiners advise that in the demonstrations each step should be written in a separate line. Very many juniors attempted to prove as generally true theorems which were true only in particular cases. The answers of the seniors on the 6th and 11th books showed that they had not succeeded in grasping the fundamental principles of geometrical reasoning.

Those questions in the preliminary *Algebra* paper which involved the manipulation of signs or fractions were badly done. Not more than a third of the junior candidates succeeded in finding

the H.C.F. of two given expressions. They showed, too, a want of clear comprehension of the word "co-efficient."

The Examiners in *Trigonometry* advise that more attention should be paid to the trigonometry of one angle, to the solution of right-angled triangles, to the drawing of figures at least approximately consistent with the data, and to easy problems in heights and distances. Computation, they say, appeared to be much neglected: a considerable number of candidates tried the question which required the use of logarithms, but only a small proportion of them obtained a correct result.

NATURAL SCIENCES SECTION.—Many of the preliminary candidates in *Experimental Science* were by no means clear as to the nature of the units employed in their measurements; and it appeared as if at some centres that portion of the schedule which has to do with the pendulum had been altogether ignored. Many junior candidates had difficulty in working square and cubic measure with centimetres and millimetres combined. The use of a formula for Charles's Law expressed in absolute temperature led to a large amount of inaccuracy, as the candidates in general quite forgot that it was necessary to add 273 to temperatures on the Centigrade scale. Comparatively few recognised the limits of accuracy in results obtainable from experiment.

The principal weakness in the *Chemistry* answers of the juniors was the vague and indefinite explanation of the law of the combination of gases by volume: even when the law was rightly stated, only a few candidates supplied explanatory examples. Another common mistake was the statement that iron pyrites is used in the preparation of sulphuretted hydrogen gas. The principle of equivalent weights was not very clearly explained; and it was often stated that the equivalent weight of an element is the same as the atomic weight. The nature of an experimental proof was misunderstood by many students. The senior answers showed a want of knowledge of the properties of the common elements and their compounds, e.g., arsenic, antimony, sulphuretted hydrogen. The answers to the question about reduction and oxidation were in most cases very unsatisfactory, indicating that many candidates did not know which were reducing and which were oxidising agents.

Very few of the junior candidates who took up *Heat* had any real idea of the meaning of "quantity of heat," and almost all were ignorant of the necessity of reading the barometer when determining the boiling point on a thermometer.

The subject of *Electricity and Magnetism* was introduced for junior candidates for the first time last December, and the answers looked over lead the Examiners to remark that every attempt should be made to teach the candidates with simple apparatus, and where possible they should be encouraged to make their own apparatus. Very few candidates, for instance, described how they would make an electroscope as though they

had ever made the attempt; elaborate forms were described, and quite fifty per cent. of the candidates proposed to pass through a cork a rod to one end of which they had already attached permanently a cap and to the other end gold leaves. The answers also implied that there was no limit to the number of battery cells and galvanometers available for the use of each student: such descriptions could never have been given if the experiments had been performed.

A considerable proportion of the preliminary candidates in *Botany* showed no satisfactory evidence of having gained their knowledge by the examination and dissection of living plants. Elementary botany taught in any other way loses the greater part of its educational value. In very few cases did the candidates appear to be more than slightly acquainted with that part of the subject which is defined in the syllabus as "the food-supply of green plants."

The composite flower led many junior candidates astray, and even such statements as "each petal is a complete flower" were much too common. Few dealt at all satisfactorily with the hyacinth-bulb. In describing the structure of a leaf these candidates, almost without exception, made the mistake of saying that there were no intercellular spaces at all between "palisade-cells." Too much importance seems very often to have been attached to teaching students to apply descriptive terms to the insignificant features of leaves and stems, with the result that many left out altogether the botanically important points. The weakest answers on the senior papers were those relating to the functions of sieve-tubes, tracheids, &c.; the question was meant to bring out a knowledge of the transport and storage of water, food, &c., in the plant, but only very few candidates showed even an elementary knowledge of the subject.

Once more the drawing of a section across part of a country represented upon a map proved a stumbling-block to many of the candidates in *Physical Geography*. The changes in the character of the weather and in the direction of the wind during the passage of a cyclone over England, for observing which many opportunities occur, were quite unknown by the seniors. Elaborate mathematical explanations of the formation of rainbows were essayed by senior candidates who had never studied one sufficiently to describe its general appearance or the colours of which it is composed.

II.—IRISH INTERMEDIATE EXAMINATIONS, 1901.

The reports of the Examiners for the Intermediate Examinations held last June were published in March. As the results of these examinations were published so long ago as the first week of September last year, it is difficult to understand why these reports are delayed so long. Some of the Examiners give hints of advice to teachers which might be useful if they came near the beginning of the educational year, but which lose most of their point, at least for the current year, when deferred for six months.

The reports themselves cannot, on the whole, be said to be pleasant or encouraging reading. The Examiners complain very largely of learning by rote and lack of intelligence in the pupils and impute some of the blame to bad teaching, especially in reference to Geography, History, and Literature. In reading the reports, however, one cannot but ask what standard the Examiners adopt. Sometimes two Examiners dealing with the same set of pupils in the same subject come to contradictory conclusions. Take, for example, the Preparatory Grade Latin papers: of the first paper the Examiner says: "The general impression was far from pleasing. The boys fall broadly into three classes. The first class (unfortunately the most numerous) consists of those that no obstacle appears to stop, who often include something that is correct in the midst of reckless guesswork that bears no resemblance to what is correct—their mode of dealing with the paper I can only describe as running amuck." The Examiners of the Second Paper say: "The answering on the whole was extremely creditable. The results, for boys so young, marvellous." One Examiner speaks of "one man's complete answer." Did he forget he was dealing with boys and girls? Another, criticising the English spelling, recommends for candidates "a thorough course of English authography" (*sic*)!

These reports lead to the conclusion that either much of the teaching in Irish schools is deficient in grip and knowledge of what it should aim at, or that the standard set in the examinations is too high. Possibly both are true. The latter defect will perhaps be lessened this year by the institution of elementary papers for pass pupils. When will the attempt be made to improve the teacher and to insist upon his possession of proper qualifications?

The subjects which meet with favourable comment are mostly those taken by a minority of pupils, such as Greek, German, Trigonometry. The subjects taken by nearly every candidate, such as Latin, English, Euclid, meet with very severe strictures.

On Greek one Examiner makes the excellent suggestion that grammar should be learnt by induction from the authors read, and not by rote from a book as a series of abstract rules, and gives proof of the failure of the latter method. Greek scansion, History, and Geography were weak, especially the last, one candidate writing that "Xerxes, for a good view of the battle of Salamis, had procured a seat on the top of Mount Athos."

Latin prose composition was unsatisfactory throughout, except in the Junior Grade. In the Preparatory Grade the report says: "More than half of the boys examined wrote the most outlandish attempts in their prose—a proof that the process they had undergone was injurious." Verse composition was almost entirely neglected, and along with this it is not surprising to find that the knowledge of Latin quantities was very poor. The unseens varied, and it is pointed out that many candidates failed here entirely who could

translate the prescribed books accurately, thus showing that they had not reaped the advantage of their preparation, and that the set books had been learnt in a bad way.

The English essays were satisfactory, except in the Junior Grade, of which the report says that: "It is manifest that in a large number of schools English composition is either wholly neglected or badly taught. One-half of the essayists had not the slightest conception of the need for order, arrangement and proportion in the parts of their essays." History calls for severe strictures. "It would appear that the teaching of history is directed mainly to fixing trivial and often unimportant details on the pupil's memory, while scarcely any effort is made to impress upon him a correct estimate of the relative importance of historical personages and events." Take another report: "The monotonous sameness of the answering revealed in too many the fact that certain petty text-books had been committed to memory." Similarly in geography: "The answering in geography proves beyond question that very little use is made of the map as a means of instruction," one statement being, *e.g.*, that "the Andes shelter Canada from the Atlantic winds." In another Grade "the map of the Balkan peninsula was taken for parts of Asia, the central or northern parts of Europe, &c., with such names as the Andaman Islands, Canara, Himalayas, Russia and many others inserted."

In French the same divorce of rote knowledge of grammar and its application appears as in other languages. In the Preparatory Grade "it would seem as if grammar were considered as a study by itself, without sufficient attention being paid to its necessary employment for correct writing or speaking." In the Middle Grade all but ten per cent. translated "hot bread," *le chaud pain*, although the vast majority certainly knew the rule that *chaud* should have followed the noun. The questions on French pronunciation were a complete failure, and "until there is an oral test the pupils will continue to learn French as if it were a dead language."

The following are some of the mathematical criticisms: In Euclid in many cases the pupils had been warned of the importance of doing deductions, and therefore rushed through the proofs of the propositions, often leaving out important portions in order to save time, but after all only making very poor attempts at the deductions. There is a failure to grasp Euclid's definitions and terms, or the logic of the procedure in Euclid, many defining a right angle as "an angle of ninety degrees." Figures are often badly drawn, and sometimes the centre of a circle appears outside the circumference.

In Algebra and Arithmetic many absurd blunders were made, arising only from thoughtlessness. Other mistakes are caused by teachers showing their pupils methods which the latter do not at all understand; and other mistakes, again, occur from untidiness, the answers appearing at the end of a perfect wilderness of symbols, which no examiners could possibly penetrate. Pupils should be

"expected not only to obtain an answer, but also to show by their work that they understand what they are doing. If this is not insisted on, the study of mathematics will cease to possess the advantages that are usually claimed for it as a mental training."

CAUSE AND EFFECT IN THE GEOGRAPHY OF BRITAIN.¹

IT is convenient to consider Lord Avebury's book and Mr. Mackinder's together, though they are different in character. Lord Avebury's chief aim is to show that present appearances are the results of past performances, while Mr. Mackinder is mainly concerned with the nature of existing characteristics of Britain and their historical and economic significance. But in both books we have the consideration of relationships between physiographic cause and consequence; therefore both may be regarded as belonging in a wide sense to physical geography.



FIG 1.—Photograph of a Globe showing the true form of the North Atlantic. (From Mackinder's "Britain and the British Seas.")

Mr. Mackinder, we may say at once, has produced a most helpful work. It is, indeed, not too much to assert that as a broad and scientific statement of the implications of the geography of the British Isles the book stands alone. The volume is the first of a series of which "the aim of each is to present a picture of the physical features and conditions of a great natural region, and to trace their influence upon human societies." If suc-

¹ "Britain and the British Seas." By H. J. Mackinder, M.A. xv.+377 pp. (Heinemann.) 7s. 6d.
"The Scenery of England, and the Causes to which it is due." By the Right Hon. Lord Avebury. xxiv.+531 pp. Macmillan.) 15s. net.

ceeding volumes are so well constructed upon this plan, interest in the science of geography will be extended by their publication.

The first part of the book relates the early history of Britain as regards position, land relief and hydrographical features. Meteorological conditions are next considered, and then we have discussions of racial, historical, strategic and economic geography among other subjects. Proceeding by the scientific method, the facts are taken, and an endeavour is made to account for them and also to predict effects which may possibly be produced by changing conditions. Looking back to pre-Columbian times, we see Britain at

development of navigation Britain has been put in easy communication with all of them. The essential qualities of the British environment are described as follows: "(1) Insularity, which has tended to preserve the continuity of social organisation; (2) Accessibility, which has admitted stimulus from without, and prevented stagnation; (3) Division into a more accessible east and a less accessible west, which has made for variety of initiative and consequent interaction; (4) Productivity of soil and climate, the necessary basis of a virile native growth; (5) Possession of a vast potential energy stored in deposits of coal, the mainspring of modern

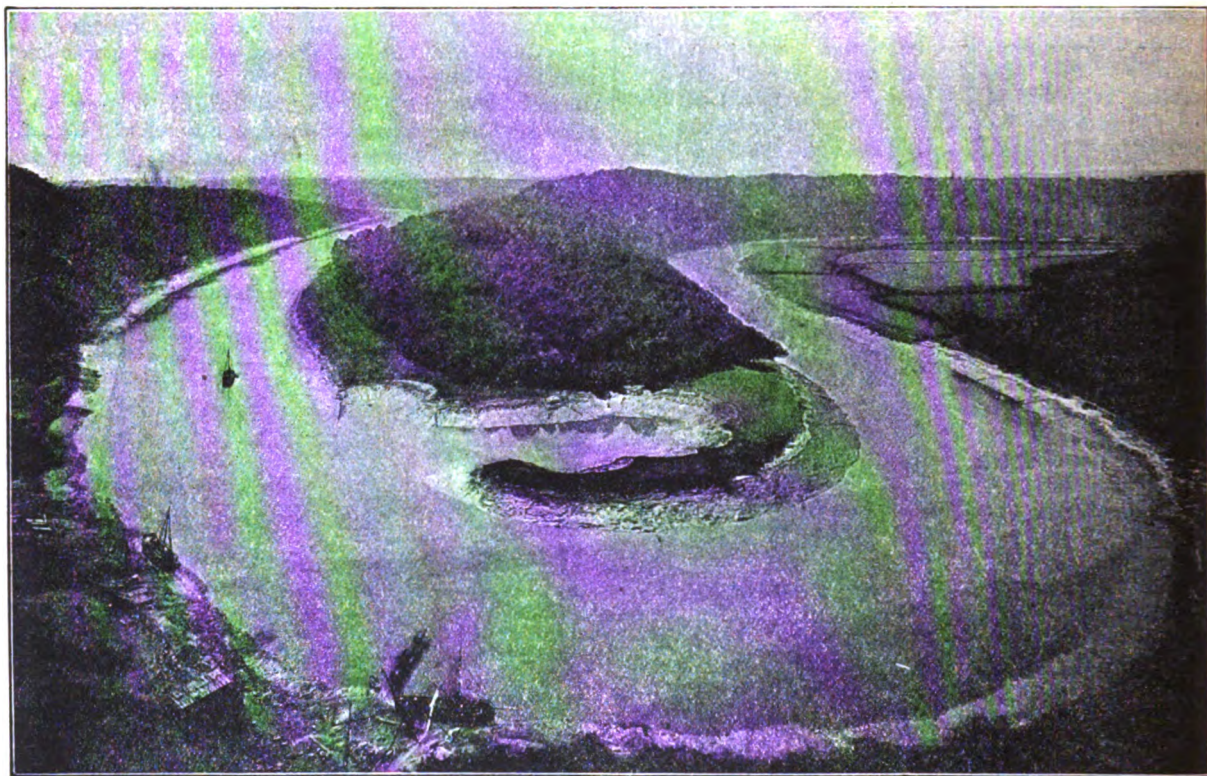


FIG. 2.—Curve on the Wye, near Chepstow (From Lord Avebury's "Scenery of England.")

practically the western end of the world, protected from interference by its insularity, but yet in touch with European civilisation. The development of the ocean highway has removed Britain from the circumference of the civilised world to the centre, and it is to the combination of these two causes that our country owes its present position among nations. Mr. Mackinder traces the changes which have occurred and suggests how their trend may be made to promote national welfare.

The accompanying illustration (p. 177) from the book shows in a very clear way why the Columbian discoveries are of such significance. The five historic parts of the world are accessible from the waters of the North Atlantic, and with the

industrial life; and (6) Interpenetration by arms of tidal sea, giving access to the universal ocean-road of modern commerce."

Space may be found for reference to a few other points of interest to teachers. Illustrating the slight depth of water between the continent and Britain, the remark is made that "the Strait of Dover is so shallow that, were St. Paul's Cathedral sunk in it, the dome would rise above the water even in the deepest part." It might have been added that the dome could not be submerged at any place in the sea around Great Britain. Another striking remark is that "only five per cent. of the total weight of the wheat crop is said to be derived from the soil, the remainder wholly from

the atmosphere." This is clear enough to anyone acquainted with the constitution of the atmosphere, but as nothing is said upon this matter, the reader who does not possess the information will scarcely appreciate the significance of the statement.

The historical aspects of geography are so well presented that we expected to find more about the positions and strategic importance of the Roman walled fortifications in Britain. For a period of about two hundred years, and during the second half of the Roman occupation, the fate of the kingdom entirely depended upon the command of the sea, and as Mr. Mackinder gives much attention to the influence of sea-power he might have pointed his remarks with references to the chain of walled towns or camps established by the Roman Imperial Government, holding the sea from Southampton, along the coasts of Sussex, Kent, Essex, Suffolk and Norfolk, round to the Wash. But, in a book which looks at geography from so many points of view, details must be overlooked. The chapters on the tides and the climates of Britain could, we have no doubt, more easily have been extended to double their present dimensions than abridged as they are; but they contain the essentials of the subjects and are sufficient for the purpose. Mr. Mackinder has, in fact, constructed a picture in which every line is boldly drawn, and none need be erased when the sketch is filled in. We should like to see a book such as his accepted as containing a standard course of study in the geography of our islands.

A characteristic of Mr. Mackinder's book, and to our minds a commendable one, is its confident or assertive style. Presumably with a full knowledge of diverse views on some of the subjects with which he deals, such, for instance as the development of our rivers, he gives his account as if no other existed. This is educationally sound, for the expression of many opinions is confusing to the student, and shakes his confidence. All we expect from a writer of a book of the scope of the one under notice is a statement of the facts as they appear to him—a crystalline digest of material.

In Lord Avebury's book we do not get this assimilative style of composition; and in places where a few words could have described a particular view we get *ipsissima verba* in copious extracts. The result is often unsatisfactory. Take, for instance, the movement of shingle around the coast of England. The general movement of shingle on our south coast is said to be from west to east, but we read, "There has been much difference of opinion whether the shingle travels from east to west or from west to east," and the reader of Lord Avebury's pages will certainly be left in this undecided frame of mind. We believe that in a book of this kind it is a mistake to attempt to give too many opinions, or to create the impression that there are different views upon everything. A good historian examines his material, judges its value, selects what he considers to be essential and trustworthy, and from it constructs a connected story in which every event is shown to be related

to the past and the future. He does not continually shake the confidence of his readers in the interpretation placed upon the facts described. Lord Avebury, however, in his desire to be impartial, overburdens his book with the statement of a variety of views upon some of the subjects with which he deals. In a volume intended for scientific readers, it is necessary to give attention to many opinions and often to quote the exact words in which they are expressed. But most of the present book is of such an elementary character that concise judicial statements would be more appropriate than extracts from the briefs of different sides.

Lord Avebury's book is not for the serious student of geology; and the reader who is unacquainted with the rudiments of geological science could not read it with understanding. The first chapter on rocks and their sequence could scarcely be comprehended by anyone beginning the scientific study of the scenery of England. Successive chapters deal with the general configuration of the land surface, the coast, origin of mountains, volcanoes, rivers, lakes, influence of rocks upon scenery, law and custom in relation to scenery, local divisions and the sites of towns, and the genesis of the earth. Each of the chapters contains many interesting points, and all of them afford evidence of Lord Avebury's interest in everything concerning nature. One of the most useful chapters to the teacher of geography is that in which the sites and names of many important towns are accounted for. There are no less than seventeen towns like Winchester, Chester, and Cirencester, built on the sites of ancient fortifications; twelve like Exmouth, Dartmouth and Falmouth built at the mouths of rivers; twenty-five like Bideford, Guildford, and Milford situated at fords, and eight like Axbridge, Tonbridge, and Weybridge, built near bridges. The comparative small number of the fourth class shows, as Lord Avebury remarks, "that our ancestors did not avail themselves of bridges until a comparatively recent period in our history."

We cannot describe the book as an important contribution to scientific knowledge, but we can say that it will infuse in every one who reads it a new interest in the scenery of our country. The illustrations are exceptionally fine, and their character may be judged by the one we are able to give, representing a curve on the Wye, near Chepstow.

SES deux premiers points de géographie seront la ville où il demeure et la maison de campagne de son père, ensuite les lieux intermédiaires, ensuite les rivières du voisinage, enfin l'aspect du soleil et la manière de s'orienter. C'est ici le point de réunion. Qu'il fasse lui-même la carte de tout cela; carte très-simple et d'abord formée de deux seuls objets, auxquels il ajoute peu à peu les autres, à mesure qu'il sait ou qu'il estime leur distance et leur position. Vous voyez déjà quel avantage nous lui avons procuré d'avance en lui mettant un compas dans les yeux.—Rousseau.

THE COMEDIES OF ARISTOPHANES.¹

SOME of Mr. Rogers's translations of Aristophanes have been published already, and have become scarce; their merit has been generally recognised, and we are glad to find that he is now at leisure to revise the old ones and to complete the series. This he proposes to do on a more ambitious scale; adding a full explanatory and critical commentary; and the volume before us, first issued but intended to be the fifth, is a welcome instalment. We confess that, although prepared to enjoy Mr. Rogers's translation, we looked with some misgiving upon the commentary of one who is not a professed scholar; so few learn, and it is so easy to forget, that in the hurry of business such a task might easily be mismanaged. But after an examination of this volume our doubts have vanished. It is true Mr. Rogers does not supply the kind of commentary we are used to, with its array of parallel passages and its professorial air. He does cite his parallels, but not quite with the professorial view; they deal rather with literary and historical questions than with linguistic. So much the better; for the other kind, have we not our Blaydes and our Merry? and these notes are fresh, full of an obvious enjoyment which is too often killed by the fear of examinations and the painful necessities of "the upper forms of schools." Not to the schoolboy or the undergraduate do these notes appeal; but to the man of culture, who has not bowed the knee to Baal, and to the scholar who still remains human. They contain, by the way, not a few good suggestions, which the scholar and critic should find worthy of consideration. These are chiefly concerned with interpretation, and commend themselves at once. In the Antepirrhema of the *Frogs* he is certainly right in his regard of the allusions to the coinage. "τὸ ἀρχαῖον νόμισμα," he says, "the immemorial silver coins issued before the closing of the mines of Laurium, and τὸ καινὸν χρυσοῖον, the gold coins issued after that event, are bracketed together as two good coinages, the equivalent of the καλοὶ κάγαθοὶ with whom alone the poet is comparing them. Both are equally pure, and both are contrasted with the worthless bronze of Callias." With this interpretation, a number of conjectures become needless at once. Again, on 756, he holds that *δμομαστιγίας* cannot mean "fellow-knave," but is a parody on *δμῳγίος*, and means "patron of the rogues' fraternity." In 790 *ἐκείνος* is referred to Sophocles, the speaker using the pronoun which was used by Sophocles at the beginning of the speech. The word *μῆλον*, in *Eccl.* 153, he takes with the scholiast, and against editors, as referring to *γνώμη* understood—"I'll not permit, for one": it is clearly wrong to translate—"I'll not let one woman do it." *ἐν ταῖς φυγαῖς* (243) is referred not to the proscriptions of the Thirty, then ancient his-

tory, but to the flight of fugitives into Athens before Lysander. The allusion in 356 to Thrasybulus becomes clear if we assume that the scholiast is wrong, and that on the occasion spoken of Thrasybulus made his excuses not to the Athenians, but to the Spartans for breaking his promise to them. *ἀπογευμαίνους* (419) is taken to mean "after dinner." So with the grammatical difficulties in *Eccl.* 795 and neighbouring lines. We could cite many more passages to show how clearly Mr. Rogers apprehends the sense of his author. The critical notes are remarkable for sound common-sense, and a judicious respect for the MSS., which Mr. Rogers can often show to be correct where they have been suspected. He rarely adopts a conjecture of his own; but one case is *Frogs* 1,028, when he prints τὸν θρήνον ἀκούσας for the unmetrical ἦνικ' ἤκουσα, and κὰν μὴ καταθεῖς ψευδορήσῃ in *Eccl.* 603. There are some good notes on language and even details of accentuation; on the other hand, the editor accepts the unmeaning legend as to the origin of *μῆλον* (*Frogs* 798), and omits to comment on the remarkable assumptive condition in *Eccl.* 179, *ἐπέτρεψας* for *ἔδω ἐπιτρέψης*, and the οὐκ in line 182.

We would also call attention to the introduction to each play. In that to the *Frogs*, the literary criticisms of the rival poets is fully explained, and the curious lack of unity in the structure of the *Frogs* itself is recognised. The occasion of the *Ecclesiazusae* is shown to be the Anti-Spartan league, and its date 393 (not, as Clinton says, 392); whilst the socialistic theories are regarded as a parody on Plato's republic.

But it is the translation wherein lies the chief value of this book; and it is remarkably good. Mr. Rogers cannot be defended in his use of certain vulgarisms, such as "going to" at the end of a sentence, and now and then his English is not quite intelligible by itself (*e.g.*, *Eccl.* 248); but, as a rule, we do not know whether more to admire his vigour of phrasing or his skill in reproducing the form of the poet without his worst grossness. It appears that at first Mr. Rogers despaired of being able to render the grosser plays line by line, and resorted to a free paraphrase; but in the end he found it possible so often, that we greatly regret he did not rewrite some considerable passages of the *Ecclesiazusae* which now appear in the freer form. We hope he will remedy this with the succeeding volumes. We may perhaps be allowed to quote a few examples of happy renderings. The lines *Frogs* 956-7 are made to run:—

Canons of verse I introduced, and neatly chiselled wit;
To look, to scan; to plot, to plan; to twist, to turn, to woo;
On all to spy, in all to pry.

The parodies are turned with much tact. In the single phrase he is very apt; as when he translates *Eccl.* 387 (*λευκοπληθής*)—

And strange it was to see
How pallid-packed the whole Assembly looked.

Or again, in 392, *ἀπομῶζόν με τοῦ πριαβέλου τὸν ὄντα μᾶλλον*—

¹ "The Comedies of Aristophanes." Edited, translated, and explained by Benjamin Bickley Rogers. IX. The *Frogs*. X. The *Ecclesiazusae*. xlviii. + 274 pp.; xxvii. + 238 pp. (Bell.) 15s.

O weep, Antilochus,
Rather for me, the living, than for him,
The loved and lost—three-obil.

But his greatest triumph is in the songs and rapid measures. His ear is certainly not faultless; there are many lines which are hard to pronounce, or contain too many syllables, as *Frogs* 1021 :

A drama I wrote with the war-god filled. Its name? 'Tis the
Seven against Thebes that I mean—

or trochee followed by the anapaest in *Frogs* 1094—
Smácked him and slápped him, In the ribs. . . .

But the task is exceedingly difficult, and as a rule it has been done with great skill, and moreover with a rollicking spirit which carries the reader along. Take as an example the ode in *Frogs* 875-884 :

O Muses, the daughters divine of Zeus, the immaculate Nine,
Who gaze from your mansions serene on intellects subtle and keen,

When down to the tournament lists in bright-polished wit they descend,

With wrestlings and turnings and twists in the battle of words to contend ;

O come and behold what the two antagonist poets can do,
Whose mouths are the swiftest to teach grand language and filings of speech :

For now of their wits is the sternest encounter commencing in earnest.

Amongst the charming songs of the *Ecclesiastusae* it is hard to choose; but take the old hag's ditty (893 ff.):

Whoever is fain love's bliss to attain,
Let him hasten to me, and be blest ;
For knowledge is sure with the ripe and mature,
And not with the novice, to rest.
Will she be as faithful and true to the end,
And constant and loving as I ?
No: she would be flitting away from her friend,
And off to another would fly,
 Would fly, would fly, would fly,
And off to another would fly.

VOICE PRODUCTION.¹

THIS readable and excellently illustrated book is gracefully dedicated to "my little Tullik," Madame Bell-Ranske's daughter, who, it appears, was changed from a delicate to a strong child mainly by her mother's lessons in voice production. It is needless, therefore, to add that the writer is an enthusiast.

The greater part of the book is devoted to an account of the larynx, and the numerous illustrations are clearer than those given in most of the voice books. A good deal is said about the correct method of breathing on which all writers since Plumptre have laid such stress. Several chapters

are devoted to schools of singing, e.g., the larynx school, the pharynx school, the resonance school, and the book ends with some very reasonable advice and with quotations from specialists. In all this, if there is nothing new there is a great deal that needs to be insisted on, and the work is strongly to be commended for the value which the writer sets on correct breathing, and on the conscientious development of the dramatic and emotional temperament. We still hear of thousands of school teachers troubled with huskiness and loss of voice, and we shall continue to hear of this until the teacher realises (he knows it already) that it is not for the good of his voice to gulp down through the open mouth draughts of cold air laden with floor dust and dense with flying chalk. If no consideration were shown for absence due to, and certified as due to, pharyngitis, which might have been prevented, the teacher's "throat" would soon be a thing of the past. No book on speaking thinks of ignoring the famous advice, "Save your life, and keep your mouth shut." It takes two months at the outside to learn how to press the tip of the tongue in the upper palate when we are inhaling. This once learnt, voice troubles are reduced to a minimum. It has been pointed out scores of times that the ordinary method of inhaling, i.e., through the mouth, dries the back of the throat and produces clergyman's sore throat and kindred troubles.

But we fear that when we have praised the author for insisting on correct breathing we have mentioned the best part of the book. It contains no index, no bibliography and not many practical suggestions. We look forward to the publication of some small volume on this subject, not by a doctor, nor by a singer who knows little physiology, but by a doctor-musician or a doctor-singer, and in such a volume we should find chapters full of exercises, or hints, on such subjects as correct breathing, standing and walking, articulation, enunciation, loud speaking, whispering, intoning, the study of one's own voice, the study of the voices of others, lecturing, reading and the like, and directions on how to teach them. Until now, this work has been divided up, and the writers give us the impression that, when all is said, the would-be speaker must come to some well-known teacher to be led in the right way. If, however, this beautifully printed work, evidently written by an enthusiast, should lead singers and teachers to think more carefully of the elementary rules on which all good speaking and singing depend, it will have been justified; and we heartily wish it success. It may lead teachers also to possess themselves of a good model of the larynx, which is worth many illustrations.

MEN or women who cannot speak without difficulty, or who are not easily understood when speaking, lack one of the first endowments indispensable for social communion; much of what they say must be ineffective, and the more ineffective in exact proportion to the numbers addressed. What they say passes by as the idle wind. Easy intelligibility is indispensable to the teacher above all others.—P. A. Barnett.

¹ "Health, Speech and Song." A Practical Guide to Voice Production. By Jutta Bell-Ranske. 290 pp. (Swan Sonnenschein.) 4s. 6d. net.

CHRISTIAN ANTIQUITIES.¹

THIS handbook meets a want which has been long felt. Most educated people, and nearly all school teachers, are interested more or less in Christian antiquities, which at so many points touch their work; but information is not easily got, and to get it many books are necessary, dictionaries of the Bible or of special subjects, and manuals such as "Roma Sotteranea," or Canon Rausens' "Archéologie Chrétienne." No single book gives anything like a complete survey of the field; and to procure the necessary library means the expenditure of a considerable sum of money. Even, then, if this were a book of mediocre merit, it would be widely useful. But it is more than that; it is, in fact, an admirable handbook, alike clear, accurate, and abreast of modern research. Those who wish to study more deeply will find guidance in a very full bibliography. We may now briefly indicate the contents.

An Introduction traces the history and limits of Christian art, classifies the monuments, and surveys the literary evidence. The next section deals with Christian cemeteries, especially the Catacombs; with an account of the "Agape" and specimens of the sepulchral inscriptions. Architecture comes next: the Basilica, its history and description; the Central Type; Church furniture, ornamentation, and surroundings. Pictorial Art follows, with interpretation of its symbols and description of its main types; Sculpture and Carving; Mosaics and Miniatures. The last two chapters deal with the Minor Arts—church vessels, glass and textiles; and with Civil and Ecclesiastical Dress. The whole book is fully illustrated.

We have already expressed our sense of the high merit of the execution; and only a few points need special mention. We are glad to see that the author speaks with high respect of De Rossi, the great pioneer in Christian archaeology, whose work has sometimes been unreasonably disparaged. The account of the Catacombs disposes of some old misapprehensions; the legend as to their unity, the suggestion that they were originally concealed, the assumption that they might be made anywhere. The dual number of priests for each Roman parish is explained by the relation of the titular basilica to that which was connected with the cemetery. The assumption of a Christian burial society for each city, all being connected together, and that from their organisation was derived that of the Church, is shown to be without definite evidence. The architecture of the basilica is illustrated by a series of ground plans, which seen together are most instructive; the round or domed type is treated with equal fulness. The only omission we need note is the old Byzantine Church at Olympia, with its interesting "fish-net" cancelli. The paintings and sculptures will probably prove most

interesting to the general reader, who will find that there is a constant tradition as to the portraiture of Peter and Paul; whilst the representations of scriptural scenes will form useful illustrations for the teacher. It would be a boon if some of the more remarkable could be reproduced on a large scale for the classroom. We have learnt much from the book, and much enjoyed reading it; and we can cordially recommend it as one of the best of Messrs. Macmillan's excellent "Manuals."

NATURE NOTES FOR MAY.¹

By the REV. CANON STEWARD, M.A.(Oxon.).

Principal of Salisbury Training College.

Animal Life.—This is a great breeding month for the spring migrants. Swifts may be expected to be seen on May-day. The Red-backed Shrike may be observed sitting on telegraph wires. Night-jars or Goat-suckers hawk round forest trees for moths in the evening. They are the only British birds that sit lengthwise along, not across a bough. If opportunity occur, its enormous hair-fringed mouth, reversible hind claw and serrated middle claw should be noticed, as well as the feet and stiffened tail-feathers of the Woodpeckers, the long tongue of the Wryneck, and the hollow in the back of the young Cuckoo. On the moors may be heard the drumming or bleating noise made by Snipe during the breeding season. By the riverside the Reed Warbler nests in the reeds, the Yellow Wagtail in osier beds, and the Kingfisher in a hole tunnelled in the bank.

The Spotted Flycatcher, our latest migrant, arrives about May 20th. Larks, Buntings, and Jackdaws (the latest of the *Corvidæ*) breed now. It will be interesting to observe the devotion of parent birds to the needs of their young. Sparrows have been noted to feed their nestlings thirty-six times an hour for fourteen hours a day.

As the spring advances the shrill notes of the Field Cricket may, in some localities, be heard at night. It rejoices in dry, sunny banks, unlike its relation the Mole Cricket, which haunts moist meadows, and during May lays its eggs. The thirsty and voracious House Cricket, which makes a continuous chirping by the attrition of its wings, loves the glowing heat of the oven or the kitchen hearth.

Entomologists may expect to notice specimens of the following butterflies and moths:—Various Whites; Fritillaries, greasy, pearl-bordered and Duke of Burgundy; Blues, Azure, Holly and Common; Skippers, cloudy and dingy; Brown Argus; Small Copper; Painted Lady (thistles); the Death's-head Moth, the Eyed, Poplar and Lime Hawk Moths (trees and palings); Puss M.; Buff Tip; Wood Tiger; Burnet; the Carpets; Orange Footman; Cinnabar and others.

Look for the Larvæ of Ruby Tiger (docks), Wood Tiger (plantain), Aglaia (violet), Purple Emperor (round-leaved willow), Hornet Clearwing (trunks of lime and poplar), Lappet (sloes), Creamspot Tiger (groundsel), Scarlet Tiger (nettles), Procris Geryon (rock-rose), Comma (nettles and hops), July Highflyer (hazel, willow, alder).

Plant Life.—In flower will be found most of the Trefoils, Crucifers, Woodruff, Field Madder, Geraniums of sorts, Salad Burnet, Geum, Potentil, Myosotis, Saxifrage, Borage. In wet meadows and by streams, Bog Bean, Water Avens, Bog Stitchwort, Marsh Valerian, Veronica Beccabunga, Marsh Horsetail; in woods, the Oak, Hawthorn, Maple, Beech,

¹ "Christian Art and Archaeology." Being a Handbook to the Monuments of the Early Church. By Walter Lowrie, M.A. (Late Fellow of the American School of Classical Studies at Rome). xxii., 432 pp., 182 illustrations. (Macmillan.) 10s. 6d.

¹ From "A Nature Diary," to be issued this summer from the Norland Press, Shaldon. These Notes will be continued month by month.

Mountain Ash, Laburnum, Holly, Spindletree, Dewberry, Elder and Guelder Rose, Solomon's Seal, Wood Sanicle, Pignut, Belladonna, Yellow Wood-Pimpernel and Ragged Robin; and many of the Orchid tribe, as Morio, fusca, *militaris* (Reading), *mascula latifolia*, *maculata*, Bird's-nest, *Laxiflora* (Jersey), Twayblade and Helleborine *Ensifolia*.

The Mistletoe is in flower this month. It will be interesting to investigate parasitism in the examples of this plant, and the Cascata or Dodder on Furze, and of the Broomrape. Grasses should now be receiving attention.

Folk-lore.—Collect proverbial sayings, the result of local observations and experience :

"Change not a clout till May be out."

"Who doffs his coat on a winter's day

Will gladly put it on in May."

"Shear your sheep in May, and shear them all away."

"A cold May and a windy, a full barn will find ye."

"Be it weal or be it woe, beans blow before May doth go."

THE SCHOOL PULPIT.

The Vocation of a Teacher.¹

I beseech you that ye walk worthily of the vocation wherewith ye are called.—Eph. iv. 1.

I AM to speak to you this evening on the vocation of a teacher. We all feel that it is impossible for anyone to be his best self in any profession, or to do that profession justice, unless he regards it with a certain pride, either as a service of his king and his country, or as a still higher service, a vocation to serve God's eternal purposes in that particular post and calling. This sense of a vocation—a relation of loyalty to something far greater than ourselves—passes into the feeling of trusteeship, of responsibility, and all the sobering dignity and inspiration that it brings. And I have no doubt that you, who have thought on these things, have come to regard this sense of a vocation, of trusteeship, as the characteristic, the real *differentia*, of the truly religious temperament. It is the aim of religion to evoke and strengthen this sense of vocation and responsibility to God.

If all men could feel intensely that their whole life was a conscious vocation—that is, that they were the agents and channels of the divine will and purpose—then the kingdom of God would actually exist on earth. It is in that way that the kingdom of God will eventually come. There is no reason in the nature of things why it should not. It is within human reach.

So we come to-night to think on our own vocation as teachers. I say ours because I was so long in your profession that I still count it as mine. Our vocation must be as clear to us as that of the statesman, the soldier, the clergyman, the artisan. There is "a vocation wherewith we" more than all others "are called." How shall we think of it and describe it?

Some elements in the answer will occur at once to everyone here, and I need not dwell on them. We are the depositaries and the transmitters of knowledge; we have to prepare our scholars for life; to train body and mind to ready action; to discipline will and attention; to keep our faces turned towards the light; to cultivate appreciation of what is true in fact and feeling, and of what is beautiful in art and expression; to give reverence for what is sacred; for purity, unselfishness, devotion, heroism; to lift our own thoughts, and

therefore our scholars' thoughts, above the sphere of the material to the sphere of the ideal, the spiritual, the divine.

This covers indeed a vast field, and such thoughts may help us in defining our individual attitude towards our work; but it does not define precisely enough the work of the teachers in the body corporate. We must look at it again.

Call up to mind the multiform activities of a great city like this as we pass along its streets. The hard-handed mechanic is in his workshop, supplying one of the needs of our complex life; the railway employé has his special function in supplying another need; the clerk, the shopkeeper, the merchant, the street-seller, the policeman—all whom we pass—have their function; and among them stand our schools. Are they mere factors in the struggle for life—workshops in which men are paid for sharpening the mental tools needed in that struggle?

No: there is more than this. In the first place, the teachers should be the idealists in every community. There is nothing in the world so stimulating, so educating, so necessary as the idealist. It is our privilege to have the entry into the ideal world; it is our duty for the sake of others to enter it. How can the men who sacrifice their lives to the community in mechanical toil, or in the cares of business, or in the ceaseless struggle for mere existence, how can they see heavenly visions? The life of a nation might sink into materialism and deadly sordid routine but for the constant hope and heavenly visions which idealists bring. That is one of the privileges and joys as well as one of the vocations of the teacher; and you know how a great teacher, an inspiring teacher, that evokes the heart and soul, does it by virtue not of his training and method, not of his knowledge, but of his idealism. The memory of one such inspiring teacher, Prince Lee, is, I hope, still honoured in Birmingham. Such a man lives in his scholars, and in his scholars' scholars.

Again, it is the teacher's work to testify to the eternity and the supremacy of moral forces. The obvious fact, visible to everyone, is that power, votes, numbers, money, seem all important. But the teacher, if a real student, is a witness of far greater, far more permanent silent forces. He weighs the things of to-day in the scale of history; he cannot be vulgarised by the common estimates. This witness is another form of idealism; it is the witness, so necessary in our complex life, to the eternal. To be faithful to the highest is our vocation; and if we are so, some of our scholars will also be faithful in their various callings.

Once more, the teachers ought by education and position to be specially sensitive and receptive to the under-tones of life; to that beating of the heart of the city to which the roar of life has dulled the ears of most men. We get into special touch with the young; we feel the *zeitgeist* in them; we ought to get into sympathy with the ever-changing generations. The young are not as we are. Who shall understand them but the teacher? We must learn from them as well as teach. Every day we should come to our class with fresh, receptive mind, with interest ever new. A teacher should reverse the line of Bishop Ken's hymn, and pray that he

May live this day as if his first.

To "walk worthily of the vocation wherewith we are called" is, therefore, to keep our heads and hearts fresh in the ideal world, to lift our scholars into it, to care for them individually, and never to let ourselves be dragged down into a dull mechanical routine. My fellow-teachers, no one who has tried to do this thinks that it is easy; and no one who has tried it regrets the effort. Much must be left unsaid, of course; but one thing must be made clear before I conclude.

In every profession good work can only be done at the cost of

¹ Abridged from a Sermon to the Teachers in the Primary and Secondary Schools of Birmingham, Preached in St. Philip's Church, Birmingham, on December 12th, 1901, by the Ven. J. M. Wilson, Archdeacon of Manchester, and Vicar of Rochdale.

some self-sacrifice. That is the ultimate law of life in an organic whole. Each of us must "die to live"; "he that loseth his life for Christ's sake shall find it," and only he. All the progress I spoke of, all idealising of a profession, is based on self-sacrifice. The capitalist, the politician, the employer, the employed, must alike surrender what seems their individual interest, and is commonly regarded as the interest of their class, before it can come back to them tenfold in a flood of general welfare and happiness. It is the same with the teacher. If we think we can do the highest work, the real work to which we are called, without self-sacrifice, we deceive ourselves. No work is fruitful without it.

I don't mean that we must work generously and faithfully. Such work is no sacrifice. What are the sacrifices involved in the effective discharge of our work as teachers? One is the abandonment of the hope, if we ever had it, of becoming rich. Some of us have abilities which in other lines of life would have commanded commercial success. We abandon that. We slip into a backwater of life, where we shall not starve, but shall not make a fortune. There are many compensations; and the right attitude for us is to accept this condition gladly. It is ours to show that life is other than the means of living. The competitive, discontented, grasping spirit is inconsistent with the temper which is essential for the teacher. All the more ought others to watch over the teachers' interests.

A far greater sacrifice is the constant association with the immature and childish mind. We teachers often lose the stimulus that comes with the necessity of expressing our thoughts so as to carry conviction to our equals. We lose the advantage of criticism by equals. And if we do not feel or mind this loss, that proves that the loss is complete, and we shall surely fail as teachers. For we cannot teach even children without a perpetual effort to clarify and brighten our own thoughts; and the children give us little help in this. They suffer silently if our minds are stagnant; as a congregation suffers under a preacher whose mind is stagnant. He may be perfectly unconscious of the fact. All he says is true; but it is not alive. Our teaching as teachers may be sound, but it may have the same fault. It is like ditch-water instead of water from a spring. It is a very real sacrifice to risk the growth of this dogmatic dulness, this scholastic self-satisfaction. Which of us teachers escapes it altogether?

A still greater sacrifice is akin to this. It is like that which clergy suffer. I mean the loss of perfect frankness of speech on all occasions. Confucius, in a saying that is probably familiar to you, compares spiritual truth and the intellectual form in which we convey it, to fish carried in baskets. The fish could never be passed from hand to hand without the baskets. The forms in which we are obliged by our position to express spiritual truths are at best very imperfect; and as our minds grow we feel this imperfection the more. And when we teachers and clergy see that the immature and uneducated mind accepts the form as if it were the very truth itself—handles the basket, we may say, as if it were the fish—we feel galled by the restraint which prevents us from crying aloud that the basket is not the fish, and that it is in itself quite valueless. This is a self-sacrifice inseparable from a profession which deals with the growing and unformed mind. We must put truths before the young mind in the form in which the young mind can assimilate and carry them. We must use baskets. If we ourselves see the fish in the baskets, then we shall value the baskets the more, and so teach that our pupils will naturally come to see the inner truths as we do. It is the teacher who has got just so far as to see that the basket is not a fish, but has not got so far as to see that it contains a fish; he is in danger; and he is the danger to the profession.

No duty is higher, few are more taxing or more remunerative than the patient and honest teaching of elementary and religious truth in such form that the child can apprehend and enjoy it, and yet that it will present no falsehood to the growing mind of the boy when the time comes for him to look for the inner meaning.

Do you regard this as a concealment, a suppression, a dishonesty? Recall the words about our Lord—"without a parable spake He not unto them." Think how backward, how slow of understanding the apostles were; how blind in heart. But He taught them in parables; and the time came in which they understood that divine life of man which He revealed in Himself and proclaimed as the Gospel to a redeemed world. We have to do the same.

It is your conviction as to your vocation, your call to bring out into consciousness all the divine life of heart and mind and soul in your scholars, that will ultimately determine your method, your attitude, your influence. You will not value discipline less, but you will see that discipline with unfailing gentleness and Christlike courtesy is of double value. You will not value quickness and originality in intellectual exercises less, but will also be on the watch for signs of the moral sympathy, of the quickness to note what is true and lovely and of good report. You will not value knowledge less; but you will value the humility, the reverence for truth, and the faculty used in the search for truth, even more than any knowledge. You will learn that it is by aiming at something far higher than apparent success that you will succeed; and succeed without loss of self-respect, and with the gain of the respect and love of the finest of the young souls around you.

Finally, I would have you remember that a large and perhaps increasing fraction of moral influence in England is passing from the Church to the School. It seems to be a part of the historical evolution of our time that it should be so. How this change will affect the character and destiny of our country, none can foresee: it will depend chiefly on the spirit that animates the teacher. If the teacher cannot rise above the commercialism and materialism that beset all life, then the school and the country lose its chief ennobling, encouraging, life-giving force. And if the teacher "walks worthily of the vocation wherewith he is called," leading his unconscious scholars into the fairer and holier world in which his spirit has its home, then in their turn his scholars will walk worthily of their various vocations, and they will look back with honour and gratitude to their teachers who bore with their irresponsive youth, and ceased not under any discouragement to sow the seed of the ideal, even though they waited long for the harvest.

ITEMS OF INTEREST.

GENERAL.

THE objection of certain ratepayers to the application by the London School Board of public rates to the erection and maintenance of buildings for the purposes of pupil-teachers' centres, to which reference was made in our last issue, has now been decided. Mr. Cockerton's decision has been given against the London School Board. As the law stands at present, the maintenance out of the rates of special schools for the instruction of pupil teachers is illegal. But should the Bill before Parliament become law, this necessary branch of secondary education may be provided by the local education authorities to be created. It is quite clear that the education of pupil teachers cannot be allowed to suffer without gravely affecting the quality of our elementary education.

THE annual conference of the National Union of Teachers was held this year at Bristol under the presidency of Mr. Allen Croft, of Nottingham. After dealing in his address at some length with the Education Bill, Mr. Croft, who is the first class-teacher to occupy the presidential chair, very naturally considered the status and remuneration of the certificated class-teachers—"the helots and pariahs of our primary-school system," as he called them. After stating the average salary of the certificated class-master to be 40s. per week, and that of the certificated class mistress 30s. per week, he proceeded to make short work of the popular idea "that teachers with their short hours and many holidays are men and women to be envied." He pleaded for better incomes and smaller classes for the class teacher, and urged that the good discipline of a school made it necessary that these teachers should have power to administer corporal punishment. The speech was well received.

THE discussion on the Education Bill at the conference of the National Union of Teachers, though it resulted in the adoption of the Executive Resolution in an amended form, revealed the existence of considerable diversity of opinion in the ranks of the Union. As adopted, the resolution reads: "That conference expresses approval of the main principles of the Education Bill, 1902, under which may be created local authorities controlling and maintaining all forms of education within wide areas, and hereby records its satisfaction with the Government's desire to place our educational system on a sound basis; but is of opinion that the measure cannot become educationally effective unless the permissive clauses of the Bill relating to elementary education be struck out, and it be made compulsory upon the local authorities to take over the control of elementary as well as of higher education." An attempt to add to this resolution, "and that the educational authority shall be directly elected for educational purposes," was unsuccessful.

MR. RHODES'S Will contains provisions by which handsome bequests are made available for educational purposes. Sixty colonial scholarships of the yearly value of £300 each are to be established at Oxford, to be used to instil into the minds of the holders the advantage to the Colonies and to the United Kingdom of the retention of the unity of the Empire. A sufficient number of American scholarships is also to be provided, so that two may be appropriated to each of the present States and territories of the United States of North America, not more than one to be filled up in any year. By a codicil, fifteen scholarships are to be established at Oxford of £250 each, tenable for three years, for students of German birth, to be nominated by the German Emperor, because "a good understanding between England, Germany, and the United States of America will secure the peace of the world, and educational relations form the strongest tie." In addition, £100,000 is bequeathed to Oriel College, Oxford; £40,000 of it to be applied to the erection of new college buildings and to making good the annual loss to the college revenues resulting from the demolition of houses to make room for the new buildings; another £40,000 is set aside for the improvement of the incomes of resident Fellows; and £10,000 each to provide an income for the maintenance of the dignity and comfort of the High Table, and a repair fund.

THE method of awarding scholarships is defined with great care in the will, as the following quotation shows:—"The students who shall be elected to the scholarships shall not be merely bookworms. I direct that in the election of a student to a scholarship regard shall be had to (1) his literary and scholastic attainments, (2) his fondness for and success in manly outdoor

sports, such as cricket, football, and the like, (3) his qualities of manhood, truth, courage, devotion to duty, sympathy for the protection of the weak, kindness, unselfishness, and fellowship, and (4) his exhibition during school days of moral force of character, and of instincts to lead and to take an interest in his schoolmates, for those latter attributes will be likely in after life to guide him to esteem the performance of public duties as his highest aim."

RECOGNISING the difficulty of estimating the relative values of these qualifications, the will states:—"As mere suggestions for the guidance of those who will have the choice of students for the scholarships, I record that (1) my ideal qualified student would combine these four qualifications in the proportions of three-tenths for the first, two-tenths for the second, three-tenths for the third, and two-tenths for the fourth qualification. . . . (2) The marks for the several qualifications would be awarded independently as follows (that is to say), the marks for the first qualification by examination, for the second and third qualifications respectively by ballot by the fellow students of the candidates, and for the fourth qualification by the headmaster of the candidate's school. And (3) the results of the awards (that is to say, the marks obtained by each candidate for each qualification) would be sent as soon as possible for consideration to the Trustees, or to some person or persons appointed to receive the same, and the person or persons appointed would ascertain by averaging the marks . . . the best ideal qualified students."

IN pursuance of the provisions of the Order in Council, dated March 6th, 1902, the Board of Education has established a Teachers' Registration Council. The council consists of the following members:—Appointed by the Headmasters' Conference—Mr. A. T. Pollard; appointed by the Incorporated Association of Headmasters—Dr. R. P. Scott; appointed by the Incorporated Association of Headmistresses—Mrs. Woodhouse; appointed by the College of Preceptors—Mr. E. E. Pinches; appointed by the Teachers' Guild—Mr. F. Storr; appointed by the National Union of Teachers—Mr. E. Sharples; appointed by the President of the Board of Education—Prof. B. C. Windle, Rev. D. J. Waller, D.D., Prof. H. L. Withers, Prof. R. Meldola, F.R.S., Miss K. T. Wallas, Mr. J. L. Holland.

THE Duke of Devonshire has appointed another batch of eighteen Junior Inspectors under the Board of Education. The gentlemen chosen all seem to have had experience in the work of secondary schools; about half of them are specially qualified to inspect in humanistic subjects and half in scientific work.

THE Board of Education has issued a list, under school districts, of Higher Elementary Schools recognised by the Board, under Art. 110, Code 1901. We notice that the number of such schools is twenty-nine.

THE Board of Education has issued a series of suggestions for teachers of manual instruction in public elementary schools. The manual training in wood or metal in the higher classes should, it is pointed out, be closely connected with the kindergarten teaching of the infants' school through a graduated course of preparatory work in the intermediate classes. Four feet run of bench and a space of at least two feet in front of the bench for each scholar should be provided in the manual training-room. In addition to a bench, there should be a set of bench tools, with a proper place to keep them, for each pupil when under instruction. Drawings made from a model, or free-hand sketch, under the direction of the instructor should be full size, or to a large scale. A graded series of actual objects of ornament or utility can be made to supply all the exercises

required. Other equally practical hints are given, and all teachers of the subject will do well to study the circular, which is numbered 459.

GOOD progress has been made in the arrangements for the Nature-Study Exhibition to which we directed attention in our last number. It is proposed to hold the exhibition in the gardens of the Royal Botanic Society, Regent's Park, London, on Wednesday, July 23rd, and following days. Promises to exhibit have already been received from a large number of institutions representing every grade of education at home, in the colonies, and in the United States of America, and it is believed that the exhibition will provide teachers and others with a convenient means of acquainting themselves with the present state of Nature-Study in schools of all kinds. Mr. John C. Medd, who is acting as Hon. Secretary, and to whom all communications should be addressed, either at Stratton, near Cirencester, or at the Royal Botanic Gardens, Regent's Park, N.W., will be glad to give full particulars as to the objects and scope of the exhibition. Additional funds are needed, and those of our readers who wish to contribute should send their donations to the Hon. Treasurer, Mr. C. S. Roundell, 7, Sussex Place, Brighton.

A LONG vacation course, intended primarily for teachers, will be held this year in connection with the Oxford School of Geography. The course will extend over three weeks, beginning on July 29th. Lectures and laboratory instruction will be given daily, except on Wednesdays, when the whole day will be devoted to surveying and drawing sketch-maps in the field. After the conclusion of the course an excursion, which may extend over two or more days, will be arranged to places of special geographical interest. Names of intending students should be sent to the Curator, School of Geography, Oxford, as early as possible.

IN order to give agriculturists an opportunity of studying farming and agricultural organisations in Hungary, the Essex Technical Instruction Committee has arranged for a visit of farmers and others to that country. The party, which will be strictly limited to forty persons, leaves London on the morning of May 16th, and arrives back on Tuesday, June 3rd. Arrangements have been made to visit Magyar Óvár, Szombathely, Bábolna, Kishér, Bázias, Arad, Mezöhegyes, Debreczin, and other places of interest to farmers. Further particulars can be obtained from Mr. T. S. Dymond, County Technical Laboratories, Chelmsford, who will accompany the party.

PROF. WERTHEIMER, of Bristol, has recently pointed out that in the whole of the United Kingdom there are not as many advanced day-students of commercial subjects as there are in the Tokio Higher Commercial School; for the number of students attending this school is 503, of whom the youngest is sixteen years seven months, and the oldest twenty-six years three months, the average age being twenty. In addition to these 503 students, who are taking complete courses in commerce of an advanced character, there are 306 students studying foreign languages only in a special department attached to the school. The graduates of the school have no difficulty in obtaining positions in the Government offices, banks, insurance offices, railways, &c., while some are employed as teachers in the various commercial schools of Japan. The school is supported by the Japanese Government, and the site and buildings cost about £28,000.

AT the examinations held by the Teachers' Training Syndicate of Cambridge University during the year 1901 in the Theory, History and Practice of Education, 117 candidates

presented themselves in June, of whom six were placed in the first class, 56 in the second, 34 in the third, and 21 failed to satisfy the examiners. 72 candidates were examined in December, and of these two were placed in the first class, 22 in the second, 33 in the third, and 15 failed to satisfy the examiners. This makes a total of 189 candidates examined this year as against 151 in 1900. For the Certificate of Practical Efficiency 162 candidates presented themselves, of whom 61 were placed in the first class, 75 in the second, 25 in the third, and one failed to satisfy the examiners.

THE School of Art Wood-carving came into existence in 1878, and after being held for a short time in hired rooms, it was transferred to the Royal Albert Hall, and again, in 1885, to the Central Technical College of the City and Guilds Institute. Owing to the increasing number of students in the latter institution the School of Art Wood-carving was moved, in 1898, to the Imperial Institute, where its work is still carried on. By means of grants from the Drapers' and Clothworkers' Companies and from the London County Council, the Committee of the School are able to offer free studentships to suitably-prepared candidates. The Committee has been compelled, on account of the defective lighting arrangements in the rooms occupied by the School at the Imperial Institute, to suspend their evening classes in which formerly an important part of their work was done, but it is probable, we are given to understand, that arrangements will shortly be made by which the evening classes can be resumed. In the meantime a special class is held on Saturday afternoons.

THE close proximity of the School of Art Wood-carving to the Victoria and Albert Museum, South Kensington, has given it great advantages. For the last eight years examinations for diplomas as teachers of wood-carving have been held, these examinations being of a most searching and comprehensive character, and the diplomas consequently highly valued and sought after. During the period the School has existed, in addition to the cultivation among amateurs of a taste for the art and sound knowledge of its technique, it has turned out a large number of highly-qualified wood-carvers holding the certificate of the School who are now engaged as teachers all over the country. Upwards of a hundred local classes have been directly started by teachers supplied from the School, and these have in many cases led to the formation of other neighbouring classes. The School, in addition, supplies from members of its staff and from its advanced students inspectors and examiners to County Councils and other governing bodies of local schools, and acts generally as a centre for the diffusion of information relating to the art.

THE eighteenth annual report of the Incorporated Association of Assistant-Mistresses is convincing evidence that the society is very much alive. The nine branches of the Association have held numerous meetings throughout the year for the discussion of educational subjects, and the financial condition of the society is satisfactory. Intending members should communicate with the Secretary, Miss A. Fountain, 3, Osberton Road, Lee, Kent.

MONSIEUR PAUL MIEILLE started the idea of a system of correspondence between pupils of different nationalities in 1896. It has now grown to such proportions that it has a yearly publication of its own, *Comrades All*, the second number of which is before us. Great reality can be given to modern-language teaching by a regular interchange of letters between intelligent boys or girls, although too much must not be expected of such a practice. With the majority, letters soon cease or become useless, but with some they form a very valuable adjunct to the

regular school or college work. The best results are obtained at first if each correspondent writes alternately in his own and a foreign language; then each can see how a letter should be written in the foreign language, and the letters that have been written, say, by the English boy in French should be returned corrected. After a time and with older pupils the correspondence can be entirely in the foreign language. It is naturally desirable that the correspondents should be of about the same age and destined for the same career. *Comrades All*, which can be obtained from the *Review of Reviews* office, price 8d., is trilingual, English, French, and German each claiming a third of its pages. These are mainly devoted to specimen letters, to which prizes have been awarded. There are many illustrations, and the accounts of travel which have been undertaken by the correspondents during their holidays form very interesting reading. All particulars concerning the correspondence may be obtained from Miss E. A. Lawrence, Mowbray House, W.C.

MESSRS. SWAN SONNENSCHN propose to publish, at the end of the present year and annually, a "Schoolmasters' Year-Book," which will contain biographical notices from a professional point of view of masters and others engaged in, or connected with, the work of secondary education. The publication will also contain a large amount of information likely to be of interest and service to educationists; particulars of societies, magazines, institutions, examinations, &c., connected with secondary education; a review of the educational year, a record of events, and probably a calendar. It is hoped that the Year-Book may become an indispensable work of reference to all who are interested in secondary education.

"WEBSTER'S INTERNATIONAL DICTIONARY" is brought within the reach of everyone by an arrangement which we have made with the publishers, Messrs. G. Bell and Sons, particulars of which will be found in our advertisement columns. By the payment of 3s. 6d., the Dictionary can be obtained at once, and the remainder of the price can be paid in eight monthly instalments of five shillings each. Some things are not worth having whatever facilities are made for obtaining them; but this is not the case with "Webster." The Dictionary is a standard one; and the new edition, edited by Dr. W. T. Harris, the United States Commissioner of Education, is a work which every school and teacher should be proud to possess. There is no excuse for being without a good reference dictionary now that Messrs. Bell have made it possible to obtain Webster's fine volume by easy monthly payments.

WE regret that in our last issue (p. 138) the price of "Chaucer's Complete Works," one volume (Henry Frowde), was given as 9s. 6d. instead of 3s. 6d.

SCOTTISH.

THE Scottish representatives in the House of Commons recently met the Secretary for Scotland in conference to consider how best to deal with the question of an Education Bill for Scotland in reference to secondary and technical education. Representative members of both political parties strongly urged that steps should be taken to deal with this branch of education without delay. They recognised the impossibility of passing a large and comprehensive bill this session, but in the meantime they thought it essential that a measure should be passed which would consolidate the various funds at present allocated by different bodies for higher education, and establish, on a wider basis than at present, local committees for the administration of such education. Lord Balfour, in reply, admitted the urgency of the question, and suggested that, if the Scottish members were sufficiently united in their views as to the lines

such a measure should follow, the Government would be prepared to introduce and pass it this session. The conference closed on the understanding that, after the Easter holidays, the members would meet again and endeavour to come to an understanding as to the main outlines of such a measure.

SIR JOHN NEILSTON CUTHBERTSON has written to the Scottish members of Parliament stating that, so far as he could judge, there was no demand for such an education bill as was outlined at the recent conference with Lord Balfour. Even if passed, such a measure would only deal with the fringe of a great question, which should be treated as an organic whole. The Higher Education Committee of the Educational Institute has taken up a similar attitude, and opposes the introduction of any partial measure, on the ground that it would perpetuate the cleavage between secondary and primary education, and delay indefinitely the introduction of a comprehensive measure. The recognition in the English Education Bill of the unity of all branches of education and of the need for their administration by one authority should greatly strengthen this opposition, and effectually check any attempt to delay a great reform through the acceptance of a partial measure. Higher education may safely be left, as at present, to the direction of the Scotch Education Department until an opportunity presents itself for co-ordinating primary, secondary and technical education into a truly national system.

THE Edinburgh Mathematical Society, at their last meeting, agreed to the following resolutions in regard to the teaching of elementary mathematics:—(1) That the primary object in teaching elementary mathematics is to afford a mental training to the pupil. The commercial, technical, or professional applications of the subject are of secondary importance in general education. (2) That there should be no undue haste to begin the study of the calculus with a view to its practical applications. (3) That pupils should not be encouraged in the unscientific practice of placing dependence on rules or formulæ which they do not understand. (4) That, in teaching any branch of mathematics, concrete illustrations and verifications, including experimental, graphical, and other methods, should, wherever practicable, accompany theory. (5) That in examinations particular methods of solution or demonstration should not as a rule be demanded; e.g., the use of algebra should not be prohibited in answering questions in arithmetic or geometry. (6) That there should not be imposed upon schools in any branch of mathematics a syllabus which does more than indicate the order in which the main divisions of a subject are to be taught.

AT a meeting of the Modern Languages Association, Mr. Charles Martin, lecturer in French at the Glasgow University, gave an address on "Recent Reform of Secondary Education in France." He said that as a result of that reform the modern side was raised exactly to the level of the classical. There would henceforth be only one diploma, one *baccalauréat*, conferring the same privileges on all. No faculty would shut its doors to the holder of the *baccalauréat*. The subjects required for this diploma were sufficiently varied to suit every type of school, and all subjects were placed on an equal footing. The reform made short work of the claim of certain subjects to be the supreme branches of learning, and recognised that brains might be trained by the study of science and modern languages as well as by the study of the classics.

IN the discussion which followed it was pointed out that a similar reform had taken place in German secondary education. The exclusive privileges of the gymnasium and pro-gymnasium had been extended to the modern schools, and the policy of bounty-fed classics was abandoned. The provision in the new

conditions for the Leaving Certificate, whereby candidates taking two modern languages are deprived of their eligibility for the certificate on equal terms with candidates taking any other two languages, was strongly condemned, and a motion was unanimously passed asking for the deletion of this condition.

THE King has been pleased, on the recommendation of the Secretary for Scotland, to appoint a Royal Commission to inquire into the opportunities for physical training now available in the State-aided schools and other educational institutions of Scotland; and to suggest means by which such training may be made to conduce to the welfare of the pupils; and further, how such opportunities may be increased by continuation classes and otherwise, so as to develop, in their practical application to the requirements of life, the faculties of those who have left the day schools, and thus to contribute towards the sources of national strength. The Commission will be composed of:—The Earl of Mansfield (chairman), the Hon. Thomas Cochrane, M.P., Sir Thomas Glen Coats, Bart., Sir Henry Craik, K.C.B., Messrs. M. Hugh Shaw Stewart, M.P., J. Cairfrae Alston, J. B. Fergusson, George M'Crae, M.P., Professor Ogston, M.D., University of Aberdeen. The Secretary will be Mr. R. B. Pearson, Advocate.

LORD BALFOUR has addressed a letter to the Lord Provost of Edinburgh on the subject of the establishment and organization of an Art School for Edinburgh. Edinburgh, he thinks, presents a field for an art school of the first rank, and provided an adequate measure of local support is forthcoming, he would be glad to recognise the school under Art. 87 of the Continuation Code, whereby special grants, unrestricted by the usual conditions, may be given to central institutions. As the Town Council of Edinburgh have shown their interest in the matter by contributing yearly to the Art School at present in existence, Lord Balfour thinks they would be the proper body to initiate and organise an art school which would be worthy of the capital of Scotland.

WELSH.

THE Carnarvonshire County Governing Body has passed a resolution deferring the consideration of a pension scheme for teachers until after the fate of the Education Bill of this Session is settled. So far as can be seen, there is some indisposition to acquiesce in the principle of pensions. It was said that the inevitable tendency of establishing a pension scheme in Wales would be that, when a teacher retired on a pension, his successor would be compelled to accept a smaller salary, and that that would not tend to efficiency. This ignores the fact that, through the new science grants, there is a large sum available for governors to apply to the contribution of funds for a pension scheme and together with the teachers' contributions to make a sound basis for pensions. But it should be remembered by individual County Governing Bodies that refusal to co-operate in the matter not only affects the particular county, but also has a damaging effect on other counties and on the scheme as a whole. Postponement of the consideration of the scheme will cause a diversion of the science grants into some other channels, and will render the ultimate adoption of a pension scheme increasingly difficult. Wales is building up a system of education for the future as well as the present, and it will be short-sighted policy if it does not realise, and that promptly, that a pension scheme is as much a protection for Governors against worn-out teachers continuing in old age in their posts, as it is a provision against old age for the teachers themselves.

At the Eisteddfod recently held at Llangollen, Mr. Herbert Roberts made some interesting suggestions for increasing the educational significance of these gatherings. The Eisteddfod have grown out of the history, aspirations and faculties of the people of Wales, and have assumed a two-fold aspect, viz., that of national recreation and national education. How, then, is it possible to make the most of the educational aspect, whilst not losing sight of the institution as affording national recreation? His suggestions were to the effect that a scheme of subjects should be proposed each year by a central committee, and that as far as possible these subjects should be taken up by each Eisteddfod throughout the country. In the case of music, it would be possible to arrange a scheme which would probably take the country through one school of composers to another till a fair acquaintance might be obtained with the best music of the world. So with literature, a set of books might be suggested round which the reading of the country would range for a certain period. This would stimulate the interest of the Welsh in the Welsh classics, because it would bring about the opportunities for an adequate knowledge of the literary riches of the language.

THE meetings of the Court of Governors of the University College of Wales, Aberystwyth, are held from time to time at different towns in Central Wales. At Newtown, at one of these meetings, the question of a museum grant for Wales was referred to by Principal Roberts in a particularly suggestive speech on the motion: "That the Council of the Aberystwyth College are of opinion that, having regard to the geographical and educational conditions of Wales, the objects to be served by the museum grants would best be promoted by such distribution of the grants as would make them available for the maintenance of libraries or museums of a national character situated in the three centres of university education in the Principality." Principal Roberts pointed out that in the great municipal centres already large sums from the rates were granted for the libraries and museums, and urged that the rural districts would repay grants from the central treasury to an extent in inverse proportion to their limited resources or to the count per head of the population. It certainly would seem reasonable to expect that distinctly Welsh libraries and museums would find a greater hopefulness of usefulness in the three Colleges of Aberystwyth, Bangor, and Cardiff, than to have a central one, however good, which to the other two would present almost as much difficulty of access as a visit to the British Museum.

At the Annual Meeting of the Welsh County Schools Association, the following motions were passed:—(1) That if one local authority be established for the control of primary, secondary, and technical education in Wales, this authority be not elected *ad hoc*, and that in any event the constitution of the present county and local governing bodies be entirely safeguarded. (2) That local authorities should have the power of co-opting or adding to their number, in a fixed and definite proportion, persons possessing adequate knowledge and experience of the work of teaching in primary and secondary schools. (3) It is undesirable that there should be a statutory limit to the rates raised by county and borough councils for purposes of secondary education. Further, the following resolution was passed:—"That this Association, having had full and intimate acquaintance with the working of the Central Welsh Board, desires to express in the most emphatic manner its loyal confidence in the policy of the Board and deprecates the spirit in which the recent attack upon the Board has been conducted." Dr. Findlay, in speaking to the last-named resolution, declared that there was no system of control of secondary education that he had seen while he was a student in Germany or during his visit to America that would compare with the system of the Central Welsh Board.

CURRENT HISTORY.

"KINGS make war: if the people had their way, there would be no wars." "Government by the people, for the people." How do these maxims of the middle of last century sound now? Consider the questions that surround the Emperor Francis Joseph of Austria-Hungary. Austria and Russia have interests in the Balkan peninsula, partly common, partly rival. Many are the diplomatic tangles, many the wars that have arisen out of their action for the last two hundred years. But just now they are agreed, at least in their policy towards the "Sick Man," and we understand the peace of Eastern Europe is thereby assured. While these two Powers act in concord, neither Macedonian discontent nor Bulgarian party strife, neither Mahomedan zeal nor Armenian despair can seriously disturb European peace. And why are they agreed? Because of their own internal troubles. Russia is always seething with discontent, and Austria is proverbial for her internal race enmities. But, here again, governments are making for peace against the unrest of "peoples." Prussia is beginning to be weary of Pan-Germanism, foreseeing international trouble, and consequently the German subjects of Austria are discountenanced by their fellow-nationalists. What will be the result, who can tell? but at present the rulers of Germany, Austria and Russia are working hard to keep the peace among the warring "nations."

THE British Empire is a federation of self-governing communities. Wonderful, if we had but eyes to see it, is this utterly unprecedented phenomenon. It is conducting war in South Africa, and Canada and Australasia are joyfully contributing men and money to the struggle. Non-compulsion is proving itself the right system even in the supreme test of war. But we must pay the price. In Canada they are feeling sore about the Alaskan boundary question: even Sir W. Laurier is "not an admirer of British policy on the American continent," while a private member of the Dominion House of Commons is "prepared for war if necessary," and would "hang the Government as high as Haman if they sacrificed one foot of Canadian soil." Western Australia is protesting against certain items of the Commonwealth Tariff Bill. Australian thought expresses itself in a local newspaper as "wondering whether, considering they have legislated to exclude Japanese from their sacred continent, it is advisable for the mother Government to be allied with the Japanese, and whether the alliance does not involve a menace to the racial integrity of Australia." We need do no more than allude to the recent agitation in Malta. It would be a useful exercise of the imagination to picture these various matters being discussed in a really "Imperial" parliament. Is not the British Empire as yet too big for such an experiment?

OF the advantages to governors and governed of freedom of speech, much has been said. Of the disadvantages thereof we hear less in the British Isles. But there must be two sides to the question, or else the world is governed with little wisdom. Otherwise we should not have occasion to read in our daily papers such things as these:—The demonstrators in St. Petersburg told the authorities beforehand that "their demonstration would be a peaceful one, designed only to make the Government acquainted with the demands of the people; there would be no attempt at rioting." Yet the police succeeded in foiling the efforts of the demonstrators. Lord Coleridge said that "martial law was unknown to the Constitution: it was prohibited by the great statutes which preserved English liberty, and it had imposed trouble over the whole of the Cape Colony and over whole districts where no rebellion had ever taken place." Mr. Redmond said that "the Government dispersed lawful meetings and suppressed the right of free

speech in districts where there was no turbulence of any kind. By imprisoning the trusted local leaders of the people in the west of Ireland and prohibiting meetings the Government were taking a dangerous course. They were shutting down the safety-valve. The only effect of coercion would be to imperil the prospects of peace in the west."

MR. ASQUITH'S remarks on the new Water Board proposed for London sent our thoughts flying back to Aristotle and his "Politics." What would the Greek philosopher have said by way of commentary on the English statesman's arguments? Mr. Asquith said, if he is correctly reported, that "the new board was viciously constituted," because, on the one hand, "it was based on the principle of indirect representation which *negatived* electoral responsibility and *popular control*," and, on the other, because "there was no guarantee that the members of the board would have expert or technical knowledge." "What monster is this?" we can imagine the Athenian saying. "He wants at the same time democracy and aristocracy. He would give to the many-headed one the power to choose its rulers. He would base his right of selection on the principle that one citizen is as good as another. Yet he would at the same time base that same election on the principle that there are 'good' citizens and 'bad,'—'good,' that is, for the purpose in hand, as a carpenter is good for carpentering. How *can* these things be? Choose by popular vote or by lottery, if you will. Or choose by merit. You cannot do both at the same time."

LONDON MATRICULATION, JUNE, 1902.

Revision Test Papers.

Latin Grammar and Composition.

I. Translate:—

A. Sed illud odiosum est, quod in hac elatione et magnitudine animi facillime pertinacia et nimia cupiditas principatus nascitur. Ut enim apud Platonem est, omnen morem Lacedaemoniorum inflammatum esse cupiditate vincendi, sic, ut quisque animi magnitudine maxime excellit, ita maxime vult princeps omnium vel potius solus esse. Difficile autem est, cum praestare omnibus concupieris, servare aequitatem, quae est iustitiae maxime propria.

B. Stant acies: sed ultra di sint pro parte rogandi, Eligite: hinc coniunx, hinc pater arma tenet; Quaerendum est, viduae fieri malimus an orbae. Consilium vobis forte piumque dabo. Consilium dederat: parent, crinemque resolvunt, Maestaque funerea corpora veste tegunt. Jam steterant acies ferro mortique paratae; Jam lituus pugnae signa daturus erat; Cum raptae veniunt inter patresque virosque, Inque sinu natos, pignora cara, ferunt.

II. Translate into Latin:—

- (a) Did there appear to be any reason why he should not have come if he were well?
 (b) He promised to obey the laws as soon as peace had been made.
 (c) He could not understand why they fought with one another, but sent his slave to enquire.
 (d) We must love our enemies, pity the weak, and forgive those who do us harm.
 (e) He all but died of fright.
 (f) He said that he was then at Tarentum, but that he was going to Syracuse in Sicily on the thirtieth of June.
 (g) Don't come to-morrow, unless you wish.

III.:

- (1) Decline *anceps*, *calx*, *crus*, *nix*, *locuples*.
 (2) Give the gender and ablative singular of—*palus*, *pulvis*, *sidus*, *aquilo*, *juventus*, *ebur*, *rete*, *acs*, *cor*, *caro*.

- (3) Give the cardinal, ordinal and distributive adjectives and the numeral adverbs corresponding to—8, 16, 70, 230, 6,000.
- (4) Give the second person singular future indicative, present subjunctive and perfect subjunctive active of the verbs of which the following are participles—*partus, sprētus, sepultus, adeptus, tonsus, fartus, fossus, solens, tonans, pulsus*.
- (5) Distinguish between—*ocēdi, ocēdi, fixere, finxere, diligere, deligere, deligare*.
- (6) Explain the construction of the impersonal verbs—*libet, oportet, interest*, and of the words—*opus, causā, instar, dignus, peritus*.
- (7) Quote or frame sentences to show the uses of the Gerund and Gerundive.

English Language and Literature.

I.—LANGUAGE.

(Not more than SEVEN of these ten questions are to be attempted.)

- (1) Show (1) that foreign influence has had but little effect on the grammatical structure of English; (2) that, during the last thousand years, the language has become more and more analytic.
- (2) What are the sources from which the following words are derived? Give the etymological meaning of as many as you can:—*orange, treacle, meerschaum, surgeon, leader* (of a newspaper), *lord, parson, handkerchief, hotel*.
- (3) What is meant by phonetic spelling? Trace the steps by which our orthographical system has attained its present chaotic state.
- (4) Give the etymology of the following pronouns, and show how their use has varied:—*this, that, what, which, whose*.
- (5) Mention any English nouns that form their plurals by processes generally obsolete, and describe the processes. Which of the following are genuine plurals, and how do you account for the forms that are not such:—*alms, summons, banns, sessions, costs, caves, weeds, riches, dice*.
- (6) Explain and illustrate these terms:—prepositional verb, retained object, gerund, split infinitive.
- (7) Parse carefully, giving your reasons, the italicised words in the following sentences—
(a) He came *when* I had gone; (b) The storm ceased *before* your arrival; (c) Ask him *why* he did it? (d) *Met*hinks 'twill darken the room; (e) If you *please*; (f) There was *none* there *but* believed his story.
- (8) Distinguish between compounds and derivatives, and illustrate your distinction from the words—*orchard, flood, nest, bridal*.
- (9) Account for the formation of the following auxiliary verbs:—*may, am, will, could, might, must*.
- (10) Analyse the following passage:—
He many an evening to his distant home
In solitude returning saw the hills
Grow larger in the darkness; all alone
Beheld the stars come out above his head,
And travelled through the wood with no one near.

II.—COMPOSITION AND LITERATURE.

(Not more than THREE of these five questions to be attempted.)

- (11) "The three principles of composition are unity, emphasis, and coherence." Explain this statement as applicable to the writing of a single paragraph. You may write an illustrative paragraph on any subject.
- (12) What are figures of speech? Quote instances of as many different kinds as you can.
- (13) Write out any sonnet that you know, and explain its structure. Draw attention to some of its happy expressions and artistic effects.
- (14) Write a brief memoir of Bacon, or Scott, or Thackeray.
- (15) In what works are the following characters found:—Friday, Dr. Primrose, Ariel, Sancho Panza, Lynette, Pamela, Sir Percy Shafton. Describe one of them fully.

English History and the Geography relating thereto.

(Only EIGHT questions to be attempted, of which either No. 6 or No. 12 must be one.)

- (1) When did *either* (a) the Anglo-Saxon or (b) the Caledonian kingdoms become united into one? What causes contributed to this development?

- (2) How do you account for (a) the success of the Danes down to the time of Alfred, (b) the re-conquest of northern England by his successors?
- (3) Explain the action of Henry II. with regard to (a) the Baronage, (b) the Clergy, (c) the administration of justice, (d) his sons, (e) Scotland.
- (4) Sketch the course of the Hundred Years' War from the battle of Agincourt to its close in 1453, and trace its effects on the condition of England. What were the relations of England with Burgundy during the fifteenth century?
- (5) In what circumstances did the long alliance between Scotland and France begin and end, and how did it affect the history of England?
- (6) Describe accurately the position of the following places, and mention briefly with what historical events they are associated:—Acre, Bannockburn, Creçy, Dunbar, Evesham, Falaise, Gerberoi, Halidon Hill, Iona, Kilkenny.
- (7) Give a short account of the relations between England and Scotland during the lifetime of Mary Queen of Scots.
- (8) Sketch the history of the Reformation in England down to the death of Queen Elizabeth.
- (9) Describe the proceedings of the Long Parliament, marking clearly the main stages in its career.
- (10) Explain clearly the causes of the Revolution of 1688, and the nature of the Revolution Settlement.
- (11) Trace in broad outline the course of English colonisation in America during the seventeenth century, indicating the circumstances in which each colony was made or acquired.
- (12) Draw a map of England showing the position (with dates) of any ten battles fought during the Civil Wars of the seventeenth century.

Arithmetic and Algebra.

- (1) What numbers of four digits each can have 119 as their G.C.M. and 13923 as their L.C.M.?
- (2) A cistern 22 feet long, 15 feet wide and 5 feet deep is filled by means of a pipe in 3 minutes. The section of the pipe is a square whose side is 15 inches long, and the water flows with uniform velocity in the pipe. Find this velocity in miles per hour.
- (3) The population of a town increases by a fixed percentage every year, and the populations at the beginning and end of a period of four years are 40,000 and 41,875 respectively. Find the fixed percentage correct to two places of decimals.
- (4) What is the difference between the true and the bankers' discount on £1,800 due 18 months hence at 3½ per cent.?
- (5) A town council wish to raise £15,435 by the issue of stock. A firm of underwriters contract for the whole issue at 98. They make £550 profit. What was the average price obtained by the underwriters for £100 stock?
- (6) Find the G.C.M. and L.C.M. of $x^2 - 27$, $3x^2 - 11x + 6$, and $x^4 + 9x^2 + 81$.
- Prove that the product of two numbers is equal to the product of their G.C.M. and L.C.M.
- (7) A man bought a house which cost him 4 per cent. on the purchase-money to put it in repair. It then stood empty for a year, during which time he reckoned he was losing 5 per cent. on his total outlay. He then sold it again for £1,192, by which means he gained 10 per cent. on the original purchase-money. What did he give for the house?
- (8) Solve the equations:—
- (a)
$$\frac{4}{x-6} - \frac{x-2}{x-3} = \frac{x+4}{x-5} - \frac{2(x-1)}{x-4}$$
- (b)
$$\frac{x-2a}{x-3a} + \frac{y-4b}{y-3b} = 2, \quad \frac{x+2a}{x+a} = \frac{y+5b}{y+3b}$$
- (9) Prove that if A varies as B when C is constant, and A varies as C when B is constant, then will A vary as BC when both B and C are variable.
- If x varies jointly as y and z ; and y varies directly as $x+z$; and if $x=2$ when $z=2$, find the value of s when $x=9$.
- (10) The first term of an arithmetical series is a , and its first, second and sixth terms are in geometrical progression; write the series.

The p th term of an arithmetical progression is $\frac{I}{q}$, and the q th term is $\frac{I}{p}$: shew that the sum of pq terms is $\frac{pq+1}{2}$.

Answers.

- (1) 1071 and 1547. (2) 4 miles per hour. (3) 1.15%.
 (4) £4 14s. 3 $\frac{1}{2}$ d. (5) £1018 $\frac{3}{4}$. (6) G.C.M=1, L.C.M.=
 $(x-3)(3x-2)(x^2+9x^2+81)$. (7) £1,000. (8) (a) $x=2$;
 (b) $x=a, y=b$. (9) 3 or -12. (10) $a, 4a, 7a, &c.$

Geometry.

(1) Draw a perpendicular to a given straight line from a given point in the straight line.

Find a point in a given straight line which is at equal distances from two given points.

(2) Equal triangles on the same base, and on the same side of it, are between the same parallels.

The straight line which joins the middle points of two sides of a triangle is parallel to the third side.

(3) Describe a rectangle equal to a given irregular pentagon.

(4) If the square described on one side of a triangle is equal to the sum of the squares described on the other two sides, then the angle contained by these two sides is a right angle.

(5) If a straight line is bisected and produced to any point, the sum of the squares on the whole line thus produced, and on the part produced, is twice the sum of the squares on half the line bisected and on the line made up of the half and the part produced.

Prove the theorem both geometrically and algebraically.

(6) Equal chords in a circle are equidistant from the centre: and, conversely, chords which are equidistant from the centre are equal.

MN is a fixed chord in a circle, and XY any diameter: show that the sum or difference of the perpendiculars from X Y on MN is constant for all positions of XY.

(7) The opposite angles of a quadrilateral inscribed in a circle are together equal to two right angles.

ABCD is a quadrilateral described in a circle and CD is produced to E. The bisectors of the angles ABC and ADE meet in O. Prove that O is on the circle.

(8) If from any point without a circle a tangent and a secant be drawn, then the rectangle contained by the whole secant and the part of it without the circle is equal to the square on the tangent.

Two circles intersect. Prove that their common chord bisects their common tangents.

(9) Describe a circle to touch a given straight line and to touch a given circle at a given point.

(10) Describe a circle in a given triangle.

Discuss the position of the centre with reference to the sides of the triangle in all the kinds of triangle mentioned in the definitions.

Show that the area of a triangle is equal to the rectangle contained by its semi-perimeter and the radius of the inscribed circle.

General Elementary Science.

CHEMICAL QUESTIONS.

(1) Explain in detail how, if you were provided with pieces of magnesium, potassium, and sodium, you would prepare specimens of (a) Epsom salts, (b) nitre, (c) common salt.

(2) What experiments would you perform to show that graphite, charcoal, and diamond have the same chemical composition? Name any other elements known to you which exist in more than one form, and describe their varieties.

(3) How would you prove that the air contains oxygen? What method of obtaining oxygen in a pure state from the air is commonly employed?

PHYSICAL QUESTIONS.

(1) What do you understand by the "Principle of Archimedes"? Show how by its means you could distinguish between an eighteen-carat gold ring and a brass one.

(2) Explain the term "Inertia." Describe two useful mechanisms in which the inertia of matter is utilised.

(3) Why is it necessary in measuring the volume of a gas to state its temperature and the pressure to which it is subjected at the time of the measurement? If a gas measures 25 cubic centimetres at 14° C. under a pressure of 350 millimetres of mercury, what volume will it occupy at 0° C. under a pressure of 760 millimetres of mercury?

(4) A thermometer is placed in some water contained in a flask. The water is heated by placing the flask over the flame of a laboratory burner. What changes will be noticed in the reading of the thermometer? Explain these changes.

Five grams of steam at 100° C. are passed into 100 grams of water at 10° C. with the result that the temperature of the water is raised to 40° C. What is the latent heat of steam?

(5) Describe fully what happens to a beam of sunlight in its passage through a prism. Account as well as you can for these changes.

(6) Why is it that, when the zinc and copper plates of a Daniell's cell are connected by means of a copper wire, an electric current passes through the wire from the copper plate to the zinc plate? What difference do you think it would make if the copper sulphate of the battery were replaced by sulphuric acid?

(7) Describe either (a) a simple microscope, or (b) a simple method of ventilation.

ANSWERS.—(3) 10.95 c.cs. (5) 540.

French.

I. Translate into English:—

Il est très bon, en voyage, d'emporter, outre son sac, provision d'entrain, de gaieté, de courage et de bonne humeur. Il est très bon aussi de compter pour l'amusement sur soi et ses camarades plus que sur les curiosités des villes et sur les merveilles des contrées. Il n'est pas mal non plus de se fatiguer assez pour que tous les grabats paraissent moelleux, et de s'affamer jusqu'à ce point où l'appétit est un délicieux assaisonnement aux mets de leur nature les moins délicieux. Au moyen de ces précautions, on voyage partout agréablement; tous les pays sont beaux suffisamment, on jouit de tout ce qui se présente, on ne regrette rien de ce qu'on n'a pas; s'il fait beau, c'est merveille, et s'il pleut, c'est chose tout simple.—TÖPPFER.

II. Translate into French:—

Three days after my arrival, walking to the north coast of the island, I observed, about half a league off in the sea, something that looked like a boat. I pulled off my shoes and stockings, and wading two or three hundred yards, I found that the object approached nearer by force of the tide. Then I saw plainly that it was in fact a boat, which I supposed might by some tempest have been driven from a ship.

III.

(1) Give (a) the second person singular imperative of *savoir, aller, mourir, valoir*; (b) the second person plural present and imperfect subjunctive of *vouloir* and *craindre*; (c) the third person singular past definite and present participle of *hair, tenir, pouvoir, naître, vivre, lire*; (d) the first person singular interrogatively present indicative of *pouvoir* and *trouver*; (e) the second person plural imperative negatively of *s'en aller*.

(2) Translate: forty-one; ninety-nine; seventy-fifth; Henry the Eighth; the eleventh of August; twice two are four; three-quarters of eight is six; how old is your sister?; her book is very dirty; he is late, isn't he?

(3) Give the feminines of *sol, fou, naïf*; the adverbs of *confus, présent, petit*; the gender of *dictionnaire, bonheur, plage*; the English of *un gentilhomme, un curé, hors de combat*.

(4) Frame sentences to illustrate the difference (a) between the preterite (*passé défini*) and the imperfect tenses, and (b) between the pluperfect and past anterior (*passé antérieur*).

(5) Form nouns corresponding to the following adjectives, prefixing the article—*doux, faible, franc, faim, froid, honnête*; and adjectives corresponding to the following nouns—*pierre, nombre, enfant, soin, gloire, paresse*.

THE business of a school is to train, and school examinations must be framed with a view to test the training, partly to enable masters to see what is really being done, partly to act as a spur on the boys and keep their efforts in a right direction, and ensure, as far as possible, that they are vigorous and true. To do this they must be of as fixed and certain a character as it is possible to make them; and no debatable ground, no excuse-land left.—Thring.

RECENT SCHOOL BOOKS AND APPARATUS.

Modern Languages.

François Louis, French poetry for Children. Selected by François Louis. x. + 160 pp. (Marlborough.) 1s. 6d.—A convenient selection of 178 poems, suitable for young children. They are graduated to some extent; among the early ones there is a large proportion of "poems" with an obtrusively moral tone. Many of the poems deal with flowers and animals, the later ones being mainly fables. The book (which, we observe, is in its seventh edition) would gain by the elimination of at least a quarter of the poems which have no charm of language or sentiment; and, above all, by a careful revision of the text, as there are numerous slips in the printing.

French Course. Second Year. By A. C. Poiré. ix. + 133 pp. (Macmillan.) 1s. 6d.—This is an interesting book, in which the influence of Gouin and his English disciples appears very obviously, though no allusion is made to it in the preface. We have here thirty lessons, each consisting of four parts, each part of five or six sentences, each sentence with a "basic word" (almost always a verb—as in Gouin's series). The result is that French appears as a language consisting of word-groups of approximately equal length, which conveys quite a false idea, and must have a bad effect on the intonation. The scenes which "must be imagined" (Gouin's idea of visualising) are not always well-chosen (e.g., *Son poing s'abat sur le nez de son adversaire; le coup de poing lui aplatit le nez; le sang jaillit et coule abondamment*). The section devoted to syntax (pp. 32-87) has the English and French on opposite pages. The rules are given briefly, and the examples are generally good and often ingenious; the excessive use of black type defeats its own end. The English translation of the exercises is given at the end, as well as a series of class-room conversations (rather, commands and comments), in which there is a good deal that might well be omitted (e.g., "He is a dungeon of learning"; "I say, you people, listen attentively"; "It is perfectly well spoken").

French Conversational Sentences. By George E. Avery. 56 pp. (Blackie.) 6d.—A little book of French words and phrases with the English in parallel columns, partly arranged according to the subject matter ("a meal," "parts of the body," etc.), partly illustrating some section of the grammar or the forms of a verb. The author wishes the book to be used in "French conversational classes"; but as it is becoming more and more the rule to avoid the use of the mother tongue in such classes, his book can hardly be recommended for the purpose. It will be more useful to teachers who adhere to the "translation method."

Xavier de Maistre, La jeune Sibérienne. Edited by W. G. Etheridge, M.A. viii. + 128 pp. (Blackie.) 1s.—A convenient and well printed edition of this popular tale. The editor supplies a short account of Xavier de Maistre, and full notes in which all grammatical difficulties are clearly explained, the final *arrêté* being taken into account. In the note on *son amie* (p. 32, l. 12) the expression *ma mie* might have been given. The old-fashioned spelling *très-noir* instead of *très noir* should not have been retained. The vocabulary (by Miss E. M. Booth) is anything but complete.

Mérimé, Mateo Falcone. Edited by J. E. Michell, M.A. 32 pp. (Blackie.) 4d.—Blackie's Series of "Little French Classics" has evidently come to stay. The little volume before us shows the same excellent discrimination and editing as those which have already been noticed. It contains the well-known tale of *Mateo Falcone* and two short scenes from *La Venus d'Ille*.

A few details in the notes require correction; thus *voilà* is indeed originally *vois + là*, but *vois* is the indicative, not the imperative.

Dumas, Les Aventures de Chicot. Edited by A. R. Florian, M.A. x. + 102 + xxxii. pp. (Black.) 1s. 6d.; without vocabulary and English notes, 1s. 3d.—We can recommend this as a most readable volume. The tale, drawn from *Dumas' Quarante-Cinq*, is full of incident, and Mr. Kirkman has added a number of useful notes (in French) as well as a very interesting contemporary account of the taking of Cahors; he is also responsible for the selection of the pictures, which deserve warm praise. Mr. Florian has written a few pages of notes (they average less than a note to each page), some of which repeat the French footnotes to the text, and a vocabulary, which is fairly complete. This book is well and on the whole accurately printed. On p. 12, l. 148, read *que* for *qui*; p. 15, footnote, *la* for *le*; p. 77, l. 26, *partir* for *parler*. The abbreviation "M.F." for modern French is inconvenient, for it more usually designates middle French; better "N.F." (new French) or "Mod. F."

Heinrich von Sybel, Prinz Eugen von Savoyen. Edited by E. C. Quiggin, M.A. xxvi. + 180 pp. (Cambridge University Press.) 2s. 6d.—The text before us is based on a course of University lectures delivered by H. von Sybel, whose life is briefly sketched by the editor. It has been annotated before, but not with the thoroughness which characterises Mr. Quiggin's edition. The introduction deals briefly with the state of Germany at the close of the Thirty Years' War; with Germany from 1648 to 1738; and then gives the principal events in the life of Prince Eugene. The text takes up just a hundred pages, and the notes seventy; the language is on the whole simple, but the historical matter required and has received ample treatment. Good indexes and a serviceable map complete the editorial apparatus. It is a book which, while appealing to the general reader, will be found particularly suitable for army classes.

Classics.

The Iliad of Homer. Books IX. and X. With Introduction and Notes by J. C. Lawson, M.A. xxxii. + 100 pp. (Pitt Press Series.) 2s. 6d.—Mr. Lawson's Introduction is good, and commendably brief. It gives a concise summary of the Homeric question, a clear account of the dialect, and a description of Homeric armour. All this is done with sound judgment; we are especially glad to see that Reichel's theory of the armour is rejected; the recent crop of school books have almost all swallowed it whole, but Mr. Ridgeway has shown it to be impossible. The only criticism we offer on this part of Mr. Lawson's book is to challenge his rendering of *σήμερα λυγρὰ* (p. xvi.). This is certainly not "uncanny symbols," but rather "symbols of death or mourning," i.e., an indication that the bearer was to be put to death, which was the fact. The notes might be shorter, but if they are not written strictly with a view to give only such help as is desirable under a good teacher, we forgive Mr. Lawson because he is interesting. His etymological suggestions (as on *αἰγίλιψ*, ix. 15) are often original, and he can illustrate ancient Greece by modern (e.g., ix. 14). But no English boy would understand that in *Βορρη* (ix. 5) the *j* was meant for a *y*-sound; the point of phrases like *ἴνα γὰρ* (x. 127) is wholly missed if *γὰρ* is not realised for an intensive particle; and "hand-beaten" as opposed to "cast" can hardly be the force of *ἔκτυπος* as applied to the tripod (ix. 122), because that would imply they were old-fashioned and therefore less valuable. Perhaps the last word may mean "new," quite a natural epithet in spite of Mr. Lawson's ridicule; or possibly, like *ἔξυλος*, it may have intensive *δ*, and be a stock epithet of tripod and cauldron.

associating them with their use, as we might say "kitchen kettle." There is no evidence for an owl-Athena, as suggested on ix. 390.

Scenes from Sophocles, Antigone. With Introduction and Notes by C. E. Lawrence, M.A. 60 pp. Illustrated. (Clarendon Press.) 1s. 6d.—This book, which is modelled on Sidgwick's well-known "Scenes from Greek Plays," compresses the "Antigone" into 711 lines, omitting the choruses, whose contents are summarised in English. Introduction and Notes are brief and to the point. The law of the final cretic (p. 9) might have been stated more clearly; every line does not end with a cretic. In 156 τis goes with ἄρημος, not with οὐργάτης.

The Antigone of Sophocles. With Introduction, Notes and Appendix, by M. A. Bayfield, M.A. xxxii. + 174 pp. (Macmillan.) 2s. 6d.—This is a volume made on the same plan as the editor's "Electra," and of much the same character: chiefly a compilation from other editors, useful enough but dry. To take a few details. We cannot agree with Mr. Bayfield that οὐκ ἄρης ἄρερ in (3) is probably for οὐτ' οὐκ ἄρης ἄρερ, the poet having become intoxicated with the exuberance of his own negatives. The original meaning of ὄμμα was certainly a "thing seen," as πρᾶγμα is a "thing done," and we do not know why Mr. Bayfield doubts it (102). We do not see how πύλων ἄκρον (411) can be translated "hills at the edge of the plain." Mr. Bayfield is not of much use in passages of real difficulty, such as (3) and (782), which he practically gives up. We do not quite understand his point in the note on αὐτόνομος (824). On the other hand, he quite rightly rejects 904-920; it has not been noticed, we think, that the passage, which recalls one of Herodotus, is identical with an oriental tale in the Buddhist "Jātaka," and its source may be in the east. We approve of the correction δέ μοι for δ' ἐμῆ in 1272. In the dramatic criticism Mr. Bayfield is generally good. We think, however, that Antigone's apparent hardness in 543 ff. may be assumed to save her sister; but Mr. Bayfield may be right.

A First Latin Course. By E. H. Scott, B.A., and F. Jones, B.A. 148 pp. (Blackie.) 1s. 6d.—This book is written on the same principle as the most approved modern-language books: that conversation should form a part of all language-teaching from the first, and that as much of the routine work as possible should be done in the language which is being taught. Hence there is life and go in it, and the language becomes more real than it appears in the ordinary manuals. There is grammar, reading, speaking, and re-translation in each exercise, and a number of proverbs are worked in. It is a capital little book, which we can recommend. There is a misprint on the last page, § 102: *vesiculös* for *versiculös*.

The Latin Period: an elementary exercise-book, by E. A. Wells, M.A. (Blackie, 1s.), attempts what is done in no other book we have met with—to build up the period from its beginnings. The principles of arrangement which are seen in the period are seen also in the sentence and in the phrase, and they are well worked out here and exemplified by frequent exercises. It is a useful book.

The Private Life of the Greeks and Romans, by Messrs. Preston & Dodge; and *Greek and Roman Mythology,* an adaptation of Steuding's book, by Messrs. Harrington & Johnson. (The American School and College Text-book Agency, 9, Arundel Street, Strand.) 2s. 3d. each.—These two volumes are good books up to a certain point, but both are somewhat confused in chronology. In the former, a sound and trustworthy account is given of the constitution of the family, and the relations of clients, slaves, and so forth, to the *pater*; but the rest of the book relates more particularly to the imperial

age, or, at least, the reader may sometimes err in assuming that what he reads holds good of all ages. Apart from this, we have no criticism to offer. The "Mythology" shows more serious faults. In respect of origins, it is somewhat behind the times, for practically everything is derived from nature worship. There is no room here for the cult of deified ancestors or great men, which indeed as a principle of mythology is too much underrated even at this day. In consequence, the heroes are often regarded as degraded gods (p. 103), although Asclepius certainly and the Dioscuri almost certainly were deified men. The antiquity of hero-worship is far greater than is here admitted. The Mycenaean age worshipped the dead, and we regard the worship of heroes as a survival, not as a growth or the eighth or ninth century. Here archæology corrects the impression produced by reading Homer. Again, the functions of the gods are in early times general, and limited later; but the contrary is assumed in this book. To come to details. The earliest female idols known on Greek soil are naked, not clothed (p. 81). Poseidon is probably a Pelasgian god, not only Ionian. So too was Pan, and his worship in Attica and other places was a survival, not an emigration (p. 64). Sanskrit *pitr* and *pitā* are the same word, stem and nominative singular respectively (cf. p. 30). Jupiter is not derived from *Diovis* + *pater*, but from the nominative case (=Skr. *dyāus*) p. 18). The owl was Athena's bird in Athens, but not everywhere (p. 28). The *peplus* was offered to her for a dress, not by nature-symbolism representing the mist (p. 27); and the custom of spreading it as a sail on a ship is not early. But if the reader can use discretion, he will find the facts of mythology fairly and clearly stated.

Edited Books.

The First Book. Song and Story for little Children. Edited by E. E. Speight and Clara L. Thomson. 223 pp. (Norland Press.) 2s. net.—This is a preparatory book to the "Junior Temple Reader" of the same editors. We can extend the high praise already bestowed in these columns upon the Junior Reader to this pretty little volume. It will make the task of learning to read the most delightful occupation of the child's day. The selections and the illustrations are alike charming. The idea of including the music and words of so many delightful folk-songs is excellent.

Scott's Waverley. Edited by E. E. Smith. 501 pp. (Black.) 1s. 6d.—The introduction to this volume is a little more extended than in some others in this series, a map illustrating "the '45" is a welcome feature, and the notes are serviceable. In all other respects the characteristics common to other volumes in the same edition are successfully reproduced.

A History of American Literature. By Walter C. Bronson. 374 pp. (Boston: D. C. Heath & Co.) 2s. 6d.—Histories of American literature are rare, and in the few existing examples somewhat voluminous productions. It has been Mr. Bronson's good fortune, therefore, to supply a serious omission, and to produce an admirable and interesting book, which is short and yet full, and condensed without sacrificing any point deserving of notice. It is a book to be recommended for all class purposes, and it will appeal to a considerable audience in scholastic circles; but it deserves also to be read in a much more general way, and any ordinary reader, or even a moderately cultured student of American things and matters, would find much that is valuable and well expressed in its pages. The author says that he has endeavoured to give the book "a literary atmosphere," and in that attempt he has succeeded. As a book of reference, this little work is excellent, for the footnotes and appendix are complete both as to facts and dates. As the text

proceeds, each author whose work is reviewed in it is the subject of a condensed account at the bottom of the page, which is so minute as to even describe his religious persuasion; while at the end of the volume a bibliography of considerable size is included and supplemented by a list of reference books. With these aids a student ought to find the examination of America's literary development both an easy and a stimulating task. To unite severe condensation with philosophic insight, and to be just and generous as well as brief, is a task which when well done shows a master hand, and these characteristics are so marked in this volume that it ought to take high rank, at least on this side of the water. The latter part of the book is a charming collection of literary portraits. Humour of a gentle, sub-acid quality is often to be noticed in Mr. Bronson's style, as when he notes that "Washington's death was doubly a calamity by reason of the flood of dull poems which it occasioned," or when speaking of the poetry written between 1789 and 1815 he characterises it as being "as dull as it is pious, virtuous and learned; it points towards happiness, but affords the reader little on the way." From a writer capable of such felicities of style, however, the opinion comes badly that "we live on the jump, and need something short enough to be read between jumps." This is inelegant, even if it be true, and hardly a dignified, though it may be a genuinely American point of view.

English.

One Hour Exercises in English Grammar. By R. Harris, M.A. (Relfe.) 6d.—A series of fifty-two graduated exercises in English grammar, drawn up with the intention of their being used as home-work exercises by candidates for the Universities' Junior Local Examinations and for those of the College of Preceptors. The questions are calculated to educe a boy's powers of reasoning.

Advanced Dictation Sentences and Spelling. 63 pp. (Relfe.) The exercises in this book consist exclusively of disconnected words, phrases and sentences. The following are fair examples:—"Her face was so scorched and scarred, that it quite scared me." "The scribe was scourged for scribbling scandalous libels." To teachers who prefer this method of teaching spelling the book will be of considerable assistance.

History.

History of England. In Three Parts. (Part II., 1485-1689.) By Geo. Carter. 327 pp. (Relfe.)—The Headmaster of New College School has compiled, with the aid of easily accessible books, this summary of English history in the sixteenth and seventeenth centuries. The home history is not badly done. It does not contain more than the usual errors and defects. But we cannot trust, for anything outside our own shores, one who can write such sentences as these:—"The Reformation is the term given to the great religious movement which revolutionised England in the sixteenth century" (p. 42). "Charles V. of Spain is elected Emperor of Germany. . . . By this election Charles became ruler of Spain, Austria, Naples, Sicily, and the Netherlands" (p. 30). It would be difficult to pack into such a short sentence as this more blunders than it already contains.

A First History of England. By C. Linklater Thompson. Part II., 1066-1271. xiv. + 211 pp. (Horace Marshall.) 1s. 6d. net.—We noticed the first part of this history a little while ago. Miss Thompson has now given us a continuation. It is very pleasingly written, well illustrated (the author has, indeed, taken great pains to procure new and useful pictures), and the history is truthfully given. We can recommend this little book very heartily.

Syllabus of English History. By C. H. K. Marten. Part VIII., 1689-1756. 18 pp. (Spottiswoode.) 1s. net.—A good summary of events, with illustrative extracts from contemporaries and standard histories. The death of Joseph II. and the crises of 1744-6 are not sufficiently emphasised; otherwise we can commend the book to students of the period.

Men of Renown. By John Finimore. xiii. + 298 pp. (Black.) 1s. 6d.—Intended as an example of "the biographical method of teaching history," this book contains an account of twenty-one warriors and statesmen famous in English history, illustrated with several pictures, most of which are good. The military predominates. Think, for example, what lost possibilities of telling something else than drum-and-trumpet history are implied in this selection of biographies for the last two hundred years: Marlborough, Walpole, Clive, Pitt, Nelson, Wellington, Peel, Havelock and Roberts. Surely it would not be difficult to have found four or five teachers and inventors to have shared the honour of the eighteenth and nineteenth centuries with some of these more "showy" men of renown.

English History during the Hanoverian Period, 1714-1837. vi. + 192 pp. (Bell's History Readers.) 1s. 6d.—This book consists of short "lessons" on many of the incidents of the eighteenth and early nineteenth centuries. It is well illustrated, and contains a chapter on social life, and summaries of the lessons. It is, in our opinion, impossible to make a "reading book" of this period, and though the author has done all that is attainable, much of it must obviously be very "dry" and even incomprehensible to those for whom its language is adapted.

Synopsis of Junior-Grade English and Irish History. By M. McPhail. 75 pp. (McPhail, Wicklow.) 9d. net—"Compiled to meet the requirements of the Intermediate programme," and intended to be used "when the reign has been thoroughly mastered in detail," this little book seems likely to achieve its purpose. Though the preface states that it is "entirely free from any religious or political bias," there are some statements which we fancy would be differently made by those who differ from the author. It consists of a summary of Queen Victoria's reign, with several tabular arrangements of chief events, persons, &c., and some examination questions.

Geography.

South Africa. Wall-Map. 42 x 50 inches. (W. and A. K. Johnston.) 12s.—Most of the country south of the 22nd parallel is represented on this large wall-map. The scale is 1 inch = about 21 miles, and there is a small inset map of Walfisch Bay on the same scale. The boundaries are very clearly indicated—a fact of no small importance to teachers of large classes. Numerical references are attached to the electoral divisions in Cape Colony. The hills are shaded in brown and are easily distinguishable, a remark which applies also to the railway lines. A useful feature is the length in miles of each degree of longitude printed in faint figures at the ends of each parallel. We are glad that no attempt has been made to incorporate all the names mentioned in the accompanying Handbook (3d.); had this been done, an excellent map would have been spoilt. To teachers in search of a sufficiently up-to-date and not overloaded political wall-map of South Africa we can confidently recommend Messrs. Johnstons' carefully produced sheet.

Tarr and McMurry's Geographies. Second Book, *North America.* xix. + 469 pp. Third Book, *Europe and Other Continents.* xx. + 574 pp. 4s. 6d. each. (The Macmillan Co.)—The volume on North America commences with 119 pages dealing with the physiography of the continent; but a boy who has mastered this section will have no difficulty in recognising the physiographic controls of human activities when

they are exemplified in his later studies. Hence the last book of the series, though it includes a similar preliminary sketch, goes more deeply into the subject, as the most convenient starting-point on a course of scientific geography. The plan is a thoroughly sound one, and, when adequately carried out, leads to the best results. We have no hesitation in saying that Messrs. Tarr and McMurry have succeeded in their task. No one can read these two books without realising, not only that the authors are geographers, but that they are teachers as well. Needless to say, the combination is not always found in the makers of text-books. The books contain a large number of maps and illustrations, mainly photographic. Most of these are excellent, though we have noticed one or two that are not so clear as they might be.

The Western World. By C. A. Wood, M.A., F.R.G.S. 16 pp. (Scholastic Trading Company.) 6d.—This is a description of the chief commercial factors in the geography of North and South America and the West Indies. Each section is illustrated by a black-and-white map. The information given both in the text and on the maps is up to date, and we have no doubt that King's Scholarship students, for whom the book has been specially prepared, will find it of considerable value.

The International Student's Atlas of Modern Geography. Under the direction of J. G. Bartholomew. 90 plates, containing a series of 105 physical, political and statistical maps. (Newnes.) 6s. net.—The purchaser of this Atlas will obtain wonderful value for his money, and become possessed of a means of securing easily the chief facts as to the geography of the whole earth. Unusual prominence is given to the physical features of different countries, which, being shown on separate maps, can as a rule be made out with great ease. An unfortunate method of binding has been adopted, with the result that the Atlas cannot be opened out so as to lie flat, the consequence being that the titles of many of the maps cannot be seen, and the map of the world (Plate 7), showing ocean currents and characteristic vegetation, is useless along its median line. The diagrams illustrating astronomical geography are not always satisfactory. On Plate 2, the apparent path of the sun is shown, but no mention is made of the observer's latitude; on Plate 3, the year's course of the moon gives quite a wrong idea of the moon's path in relation to the earth's orbit. The time-chart is coloured in a manner which is not explained, and the scheme is by no means self-evident. The greatest attention is very properly paid to the geography of the home countries; there are nine separate maps of the British Isles, four of the whole or parts of England and Wales, three of Scotland and three of Ireland. The requirements of students of commercial geography have been carefully borne in mind, such subjects as trade routes, density of population, and so on being fully illustrated. The Atlas is sure to secure a wide popularity.

The Howard-Vincent Map of the British Empire. By G. H. Johnston. Size 72 in. by 63 in. (W. and A. K. Johnston.) Price, on rollers, varnished, 21s.—The new edition of this excellent wall-map appears at a very appropriate time. The map is widely known, but to those who have not seen it we may say that all the British possessions are shown in red tint upon it, and that particulars are tabulated as to their area, population, annual revenue and strategic value. Imperial sentiments are printed in several places upon the map, and there is an inset showing the foundations of the present Empire in 1797. Some of the sentiments are pitched in a key better adapted to the platform than the school-room, where it is desirable to encourage comprehensive and sympathetic views of all nations rather than to be continually urging children to be "ever ready to fight shoulder to shoulder for Empire and

liberty." But whatever may be thought about this, the map itself is a fine piece of work; the names being very distinct and well selected. The commercial routes shown are also those commonly used. The information tabulated as to the situation and strategic value is often outside the mark. Thus, with Australia we read: "The great island continent of the South Pacific. The future home of 100,000,000 patriots." And with Orange River Colony we find, "The republic which forfeited its independence by alliance with the rebellious Transvaal." What has this to do with situation and strategic value?

Asia. Illustrated Continental Readers. 160 pp. + 15 coloured maps. (Blackie.) 1s. 6d.—This series of geographical readers should become popular with teachers. Its distinguishing features have been pointed out before; the illustrations are, as a rule, excellent; most of them are reproductions of photographs; the coloured illustrations make one wonder how it is possible to produce the book so cheaply. In the text itself it is pleasing to notice that an attempt has been made throughout to cultivate the reasoning powers of children. The geography of Asia is described in a simple but stimulating manner; we can cordially recommend the book to teachers of elementary classes.

Science and Technology.

A Text-book of Magnetism and Electricity. By R. W. Stewart, D.Sc. Fifth edition. 354 pp. (W. B. Clive.) 3s. 6d.—A Note to the fourth edition states that much new matter appears in an additional chapter on Practical Applications (mostly written by Dr. R. H. Jude), which gives, in a space limited to eighteen pages, a brief description of Electric Bells, Telegraphy, the Telephone, Dynamos, and Lusters. New sections also appear to have been inserted on the following subjects: Spark and Brush Discharge, United Action of Currents, Resistance of Liquids, Secondary Batteries, and the Co-efficient of Self-induction. The volume now contains all the subject-matter which may be required for the Intermediate Science and Preliminary Scientific examinations of London University. The table of contents at the beginning of the volume requires re-paging.

Cassell's "Eyes and No Eyes Series." By Arabella B. Buckley (Mrs. Fisher). Book V., *Trees and Shrubs*, 80 pp., 6d.; Book VI., *Insect Life*, 80 pp., 6d.—We have previously commended the first four numbers of this excellent series of reading-books—now completed. It would be difficult to find anything better adapted to the purpose for which they are intended—to interest school-children in plants and animals. Mrs. Fisher knows how to be simple without sacrificing accuracy of fact, and how to interest children without descending to puerility of style. The books are of graduated difficulty, and the information conveyed in these last two numbers may be made the groundwork for some very solid nature-study on the part of the elder scholars. The beauty of Mr. Muckley's illustrations, some of which are full-page coloured plates, adds largely to the value of the series.

A Laboratory Manual of High-school Botany. By Frederic E. Clements, Ph.D., and Irving S. Cutter, B.Sc. 123 pp. (The American School and College Text-book Agency.)—This is professedly a laboratory manual only. It contains useful outlines of work on the histology, anatomy, and physiology of plants. Of these the section on physiology is the best. Clear instructions are given for thirty-nine simple experiments. We doubt, however, whether experiment 27 would prove a success if carried out in the manner described. "Phytogeography"—a branch of Botany which we should like to see developed in this country—is touched upon briefly. The students are instructed to select a readily accessible portion of the vicinity, to

draw a map of it to scale, and to indicate upon this the different plants to be found; colouring "hydrophytic," "mesophytic," and "xerophytic" areas diagrammatically. The glossary at the end of the book is very necessary.

Practical Exercises in Magnetism and Electricity. By H. E. Hadley, B.Sc.Lond. xii. + 231 pp. (Macmillan.) 2s. 6d.—This book, which contains a very large number of experiments, deals with laboratory work in Magnetism and in Frictional and Voltaic Electricity, and covers a considerable range. The first 62 pages are devoted to magnetic experiments. Preliminary exercises on making magnets are followed by investigations on the inverse square law, accurate determinations of dip and finally of "H," from which it will be seen that some small knowledge of algebra and angular measurement is assumed. Frictional work is assigned 45 pages, in which attempts are made to map electric fields, and experiments with condensers and even with the Wimhurst are given. The author displays a fondness for paraffin wax and sealing wax which our experience has shown to have but a short life in a large class, and to compare badly on all counts with ebonite. The remaining hundred pages on Voltaic work have been the especial care of the author. Some experiments on simple cells are followed by the construction of solenoids and galvanometers. After this, resistance and Ohm's law and the potentiometer, then we find ourselves dealing with Joule's law, a good little account of electrolysis and even with galvanometer constants, hysteresis and induced currents. An appendix is given showing how some of the apparatus can be made. The material requirements are considerable, which goes against the use of the book for large elementary classes in schools, but where an extended course is required with plenty of time for its completion we strongly recommend the book.

An Introduction to the Study of the Comparative Anatomy of Animals. By Gilbert C. Bourne, M.A., D.Sc. Vol. II. The *Cœlomate Metazoa*. xviii. + 321 pp. (Bell.) 4s. 6d.—The first volume of Dr. Bourne's "Comparative Anatomy" was published in 1900, and deals with animal organisation, the Protozoa and the Cœlenterata. The present book completes the author's work, and together the two volumes will serve admirably for students preparing for preliminary and intermediate science examinations of the universities. Again adopting the system of "types," Dr. Bourne here describes the liver-fluke, earthworm, fresh-water mussel, snail, crayfish, cockroach, amphioxus, dogfish, and other animals. Since the frog is taken as a type of animal organisation in the first volume, teachers will at once see that the chief cœlomate forms, a knowledge of which is required by undergraduates, have been selected for treatment. An important place is assigned to the subject of development, and a helpful chapter given on the distinguishing characteristics of the mammalia. The work as a whole can be highly recommended.

Mathematics.

The Tutorial Arithmetic. By W. P. Workman, M.A., B.Sc., assisted by R. H. Choape, B.A. xii. + 542 pp. (W. B. Clive.) 3s. 6d.—The principal merit of this treatise is the attention paid to methods of computation; in this respect it compares very favourably with most of its predecessors. The notation of algebra is occasionally introduced with great advantage; and the treatment of theoretical points is usually clear as well as sound. A certain amount of the so-called theory of numbers has been introduced, including the notation of congruences, a proof of Fermat's theorem, and so on. Among the examples there are some very interesting problems, especially those in which missing figures have to be discovered. Mr. Workman is evidently fond of recurring decimals, to which he gives a great

deal of attention; very likely this will interest clever boys, but too much time is generally given to this with average pupils, and we hope this book will not encourage such waste of energy. The examples on the metric system are mostly of the right kind. Altogether this is a stimulating and novel book. In the note on page 464 there is an obvious error, since the author has forgotten to indicate that the modulus is prime; and on p. 432 it is inferred, without proper explanation, that if $N = (a+x)^2$, the quotient $(N-a^2) / 12a$ is near to x ; all that is proved being that this quotient differs from x by less than $\frac{1}{4}x$.

Spherical Trigonometry. By the late I. Todhunter, M.A., F.R.S. Revised by J. G. Leathem, M.A., D.Sc. xii. + 276 pp. (Macmillan.) 7s. 6d.—Mr. Leathem has performed his task of revision in a very able and judicious way. The general character of the work has not been altered, and it has been restricted to a reasonable size; at the same time substantial additions have been made, all of real interest and importance. Thus the principle of duality has received proper attention throughout, there is an excellent account of properties of circles on a sphere, and a chapter on the extended definition of a spherical triangle, which is essential in the discussion of various problems of analysis. Crofton's geometrical proof of Delambre's and Napier's analogies is also included, and there is a considerable number of new examples.

Miscellaneous.

Notes of Lessons on the Herbartian Method. By M. Fennell and Members of a Teaching Staff. 270 pp. (Longmans.) 3s. 6d.—This is one of a large class of books which we may expect as the result of a serious and systematic study of method and procedure in education, which is an excellent thing, and of an excessive reverence for the word of the Herbartian tradition, which is by no means so excellent. The title-page tells us that it is "based on Herbart's plan," but what is really meant is the "plan" of Ziller and Rein based on Herbart's psychology. Of this latter a confused and uninformative account is given in a few pages of preface, which, being meant for the unphilosophical reader, will certainly lead him into difficulties. The terms "contents," "innate ideas," "presentations," "presentative activities," "circle of thought," all occur within the first twenty lines; and the subsequent pages are like unto these. With a similar loose sense of the importance of clearness about technical words, we find the teacher being directed to "deduce" something from the class. Any book that affects to provide exact procedure and the exact matter for the instruction of all and any class on all or any subjects is an exceedingly dangerous weapon to place in the hands of the teacher. It is well to draw up such notes, frequently too, for one's own use and self-correction, but it is flatly contradictory of the spirit of Herbartianism to attach so much importance as is implied in this practice to the objective view of the material of instruction. The most important fact for the teacher is the perpetually varying contents and conditions of the minds with which he is dealing; and if he wants material for use in stimulating or feeding those minds, he should go, not to school-management books, or plan books, or books of formal object-lessons, but to first-hand authorities. The book before us may be commended as the exercise of an industrious staff keen on applying, if sometimes not very wisely, what they have read of psychology; and mature teachers may be interested to see how others have treated a great number of common class-topics. But the young teacher should draw up his own plans, subject to the criticism of others who have some acquaintance with his pupils.

Passages from the Life of an Educational Freelance. Translated from the German by William H. Herford. viii. + 204 pp.

(Isbister.) 3s. net.—Dr. Ewald Haufe is the freelance, and his life proves to be as varied as it is interesting. There is much impatience of traditional pedagogy shown, but a belief in natural education—the development of man in accordance with the laws of nature—served as the incentive which carried the writer through an almost overwhelming succession of untoward circumstances. Towards the close of his book Dr. Haufe says, "To-day I can look back as an honest man, who did not work to gain place or title, money or renown, but followed his inner impulse and was faithful to his best self." In this faithfulness to his ideals he was encouraged by his wife, an English lady he met among the Dolomites. Though the orthodox schoolmaster may be sometimes shocked, there is much in this volume which will do him good.

The Girl from St. Agneta's. By J. H. Yoxall, M.P. 250 pp. (Ralph Holland.) 3s. 6d.—We are in doubt as to the purpose of the author. If it is to portray the life of a woman teacher in a village national school, we think the picture cannot be regarded as typical. If he has no more serious purpose than to amuse the uncritical reader, he has probably succeeded. The writer has a graphic touch in describing scenes and places; but he frequently betrays a want of nicety in his choice of words. The repetition of such a pleonasm as "bumpkin lout" is unfortunate.

The nineteenth annual issue of *Holiday Resorts*, which contains recommended apartments and hotels at favourite vacation centres in all parts of the world, has now been published. The sub-committee of the Teachers' Guild responsible for the preparation of the little book has done its work as well as ever. Copies of the book may be obtained (1s. each, net) from the General Secretary of the Guild, 74, Gower Street, W.C.

Westminster. By Reginald Airy, B.A., Queen's Scholar at Westminster, 1891-96. With 51 illustrations. xii. + 169 pp. (Bell's Public-school Handbooks.) 3s. 6d. net.—Following the lines of Bell's series, which is addressed rather to the Philistine than to the thoughtful, Mr. Airy devotes about one-third of his book to a historical sketch, and the rest to buildings, games, and so forth. In the first part, he follows pretty closely on the footsteps of Mr. John Sargeant, adding, however, some more detail in the description of school life, past and present. We learn for the first time that the famous pancake is now made of putty. The sketch is not at all badly done, except that Mr. Airy tries to be funny in a fashion which he may regret ten years hence. We are glad to see Busby dealt fairly with; he was far more than a flogger, he was a great man. We note with interest that a junior boy is never allowed to say "I think" or "I thought." The latter part of the book, illustrated by photographs, is good. As a record of what is, this and its like will one day be invaluable; as a history it pretends to no authority or completeness. Mr. Airy should avoid an estimate of the living; it is sure to be over laudatory, and it is probably impossible for an old boy, even a young one, to form a just estimate of his school at all. There is an appendix on "the play," with a specimen. Westminster has produced many distinguished men; but its statesmen and divines hide their heads before the names of John Dryden (which still remains cut in a bench) and Ben Jonson.

Chart of the Rules of Harmony. For Students. On a Card. By Arthur Somervell. (Clarendon Press.) 1s.—Mr. Somervell's reputation as a composer hardly led one to expect him to turn his attention to the production of a serviceable little compendium like the present, which supplies a want well known both to students and teachers of harmony. In a short compass Mr. Somervell has managed to exhibit all that is really essential in dealing with the fundamental principles of musical theory, though

some theorists will ask with surprise, why he goes no further than the dominant $\frac{7}{4}$ in these days when book after book upon harmony deals more learnedly than lucidly with the chords of the eleventh and thirteenth. It is a great pleasure to possess this chart of rules, which ought to shorten the labours of students immensely.

CORRESPONDENCE.

The Editors do not hold themselves responsible for the opinions expressed in letters which appear in these columns. As a rule, a letter criticising any article or review printed in THE SCHOOL WORLD will be submitted to the contributor before publication, so that the criticism and reply may appear together.

The Teaching of Geometry.

"EXPERIENTIA DOCET," and your mathematical readers generally, will be interested to hear that the Mathematical Association has appointed a Committee to consider the teaching of elementary mathematics.

The members of the British Association Committee, your correspondent remarks, "have for the most part had very little experience in teaching elementary mathematics to young students." The Mathematical Association Committee, on the other hand, consists almost entirely of assistant-masters from public schools (as the Committee holds frequent meetings it was impossible to get representatives from schools situated far from London), so it is guided by practical experience obtained in many different schools, and its suggestions will be more detailed than those of the more august body, which will, no doubt, deal with broad questions of principle.

Some years ago the authorities at Oxford and Cambridge decided not to insist on Euclid's wording and method of proof. The results have been beneficial in every way and have led to no confusion. The time seems now ripe for another step, but many schools feel that examining bodies must move first. The Civil Service Commissioners have already moved, and, if schools show general agreement with the proposals of the Mathematical Association Committee, I have reason to believe other examining bodies will also move.

Your correspondent's chief objection to reform seems to be "the initial divergence of opinion among the reformers themselves." He would be astonished at the unanimity of the Mathematical Association Committee, but perhaps he would not call us reformers; certainly we realise that no improvement in our educational system is likely to result from a hurried step more or less in the dark. We consider it would be unwise to propose further change at present than the introduction of a course of geometrical drawing and measurement, and the shortening of the course of Euclid "by judicious omission and readjustment." The suggestions of the Committee will appear in an early number of the *Mathematical Gazette*—the organ of the Association.

I ought to point out that the Committee of the Mathematical Association (which has representatives from nineteen different schools) must not be confused with the so-called "Committee of twenty-two masters" whose memorandum "reflects a partial opinion from nine schools only." There is evidently a good deal of misapprehension about that letter, and perhaps it is time its history was written. The "Committee" referred to never met; in fact, it never existed. One of the twenty-three (for there were twenty-three) wrote the letter and sent it to a few of his personal acquaintances (including myself), nearly all of whom signed it; the two or three who did not do so objected to details and asked for alterations to be made, but time did not permit.

Finally, may I express the hope that all your mathematical

readers will carefully consider the suggestions of the Committee when they are published. I hope to send a copy to every school mentioned in the "Public Schools Year Book" and to ask for replies, which will be carefully considered by the Committee before issuing a final report.

A. W. SIDONS,

Hon. Sec. Mathematical Association Committee.

Harrow School.

As one who has taken an exceptional interest in the teaching and in the methods of elementary geometry, may I urge certain points in the discussion to which you have opened your columns. The views of those who, like myself, are in favour of reform, are so various that the danger exists that a lack of cohesion may render the movement abortive, the more so that any reform betraying indecision or deficient in scientific completeness is likely to be resisted by an opposition, compactly united in a way which has no parallel outside religious persuasion. In no other branch of study is there any such standard of doctrine as is Euclid for mathematicians.

To avoid confusion it is most necessary to distinguish in this discussion two classes of proposals:—

(1) Proposals which do not raise the question of the replacement of Euclid as a text-book. Under this head come such considerations as: (a) The method of introducing the first ideas of geometry to the beginner, e.g., by a previous course of drawing geometrical figures, the use of instruments, &c.; (b) All work subsidiary to the text; (c) The methods of imparting the subject, orally or otherwise, the time given to it, &c.

(2) Proposals which directly raise the question of modifying Euclid's text or of substituting for it a modernised course of demonstrative geometry. Under this head come the following considerations:—(a) Shall the axiomatic basis be changed? (b) What sequence shall be adopted? (c) Shall arithmetic and algebra be introduced into the text? (d) Is any considerable amendment of the scope of Euclid's subject matter advisable?

Now, however useful the discussion of the points included under the first head may be, manifestly any measures proposed in regard to these must be of the nature of recommendations. Many teachers already have recourse to at least some of the measures advocated as desirable; and the most ardent Euclidian may or may not subscribe to these. It is, however, over the points raised by proposals included in the second head that irreconcilable differences of opinion are liable to arise, and it is with these that I wish chiefly to deal. Any system of reform proposed, to have any chance of success, must be such as to commend itself to a majority of mathematicians. The changes made must be of such a character as to make the retention of the old system indefensible.

Now, as a type of the proposals to change the axiomatic basis, I may take the case of Euclid I. 20. The retention of this as a demonstrated proposition is defended, I think, on the strictest scientific grounds. Science is concerned not only in revealing facts new to the student of them, but also in correlating facts already known. Isolated facts are the *bête noir* of science. Again, if the axiomatic basis is to be extended, what exactly shall determine the limits of its extension? Further, is it worth while to advocate a change which on reasonable grounds is certain to be regarded as a flaw by those to whom we wish to carry conviction, and which after all does not appear to result in much appreciable gain in shortening the course?

In a revision of the sequence lies, I believe, a possibly acceptable solution of our difficulty. But to be acceptable the sequence must be irreproachable. No gap must exist in it. It

should be at least equal in this respect to that of Euclid. The ideal at which Euclid aimed in Books I.-IV. (to which I will confine myself) was obviously to treat, firstly, of straight lines, angles, and rectilinear figures; and secondly, of the demonstrable properties of the circle. The latter figure is introduced incidentally only into the First Book for effecting the construction of certain problems *imagined* to be necessary to the sequence. In the fulfilment of this ideal, it thus came about that in Euclid's system sixty-two propositions are presented before the geometry of the circle is reached. The circle should undoubtedly be taken much earlier, but certainly not first. There is a tendency apparent in some earnest reformers to mistake what is useful to put before beginners in the subject as equivalent to what is advisable to be introduced into a revision of the deductive science. We set a beginner to draw angles of various sizes, to bisect them and so on, the purpose being to give him a clear conception of the terms, *angle*, *bisector*, &c., just as his previous experience has yielded him a conception of the *straight line*. But this stage forms no part of the science of geometry. That "the circle is the easiest figure to construct" is not a sound argument in favour of beginning the science with the circle and constructional problems. Problem construction does not establish general principles: a knowledge of principle is the basis of construction. Euclid's chief flaw is the presumption that the problem is an essential step in the theory. As an example of the fallacy I may cite Euclid I. 6, in which, though I. 3 is supposed to be applied in the proof, the application is negated in the proposition itself; the proof really depending on the axiom underlying, not proved in I. 3, that some part of the greater magnitude is equal to the less.

Can algebra be introduced with advantage into the text? I think not, for many reasons: (1) Elementary geometry should be as concrete as possible, and the study should precede that of algebra. (2) The expression of III. 14, 15, in the form $a^2 + d^2 = r^2$ does not shorten the actual proof: the result is a strictly geometrical one in an algebraical dress. The place of algebra in such cases is as a supplement to the text and not part of it. (3) The geometrical proofs in Book II. are useful as concrete examples of important algebraical formulæ; few teachers, I imagine, omit to draw attention to the algebraical equivalents. Euclid's proofs, however, are unnecessarily cumbersome and fail to bring out the connection of closely related propositions.

I regard the scope of elementary geometry as it exists in Euclid as tolerably comprehensive. The treatment of loci, &c., should be left to the discretion of the compiler and teacher, as serving rather to illustrate and apply the text, and belonging, therefore, rather to the developments of the subject.

In conclusion, I would suggest that the difficulty of teaching geometry is due more to the method of teaching than to the text-book. Let the geometry class be deprived of its books and taken entirely by question and answer, with blackboard demonstration, three-quarters of an hour daily (the subject is more than worth it): let the pupils continue to ascend rung after rung without constantly harking back to the bottom of the ladder; and though every step will not be remembered, the reasoning faculty will be developed and the greatest possible interest engendered. The subject matter of Euclid I.-IV. (with riders to boot) is thus easily gone over in a year, and the meaning of the science grasped in such a way that there will be no difficulty about the subsequent proper use of the book. Improve the text-book by all means, but at least let it be as strictly demonstrative as, and more scientific than Euclid.

H. W. CROOME SMITH.

Bristol, March 19th.

Mathematical Teaching in Secondary Schools.— An Appeal to Examining Boards.

NECESSARY reform in mathematical teaching has placed masters, who are responsible for school mathematics, in a difficult position. They have to devise a course which will enable boys to pass the various school examinations and also apply what they have learnt in the science laboratory. It is not only because ability to do the former does not give facility in or even power to do the latter that a change is demanded, but also because it is becoming generally realised that a much larger number of boys can understand and use the concrete mathematics of the laboratory than can assimilate and grasp the abstract mathematics of the class-room. The letter from public schoolmasters in the February number of *THE SCHOOL WORLD* suggests some changes in the teaching of elementary mathematics, which would undoubtedly benefit the duller boys and those who have not much time to give to the subject, and would, moreover, probably make more thoughtful and careful those who aspire to university scholarships and to advancing mathematical science, but it is impossible to adopt them in classes which have to go in for school examinations of the present type.

As it is not practical, except in very large schools, to have more than one mathematical course for boys below the age of sixteen, will not those who control our school examinations help us by altering the character of these examinations? Much of the stagnation and lack of progress in acquiring mathematics is largely due to the necessity of sending boys in for periodical examinations, and especially for lower school examinations in deference to public opinion.

Teaching naturally falls into lines which ensure boys passing these examinations. In Euclid, a boy is made to learn and write out the proofs of the propositions of Books I. and II. for a period varying from one to three years; after that he is sent in yearly for an examination which demands absolute familiarity with these proofs, but not necessarily with the geometrical truths proved. Both he and his master know that he cannot be relied on to do riders under the stress of examination, and that it is necessary, if he is to make certain of passing, he should be able to write out without the least hesitation the proof of any proposition of which he is given the enunciation.

Instead of learning, understanding, and being taught to apply Books III., IV. and VI. in the next year, he is made to learn and write out part of Book III., or perhaps the whole of it, and then made to revise all he has learnt for the yearly examination. This process goes on in succeeding years, and the result is that a boy takes six or seven years to learn to write out the proofs of Euclid's propositions without, in many cases, a grasp of the truths proved or an insight into the subtlety of the method, when he might understand them thoroughly and learn to apply them to problems in mensuration, trigonometry and mechanics in three or even two years. Elasticity of mind, originality, a feeling that progress is being made, which is the most powerful incentive to work, all result from pushing on, and, in the end, a better understanding of Euclid's truths and methods would enable all but the duller boys to get up his proofs again, if it were necessary, with very little trouble. The same faults and causes exist in the teaching of arithmetic and algebra, though not in such a marked degree. In arithmetic, boys are kept too long at complicated vulgar fractions and recurring decimals instead of being taken on to proportion, areas, approximation, &c. because the solving of the former depends more on memory than on thought, and the examination papers contain many questions on them. In algebra, division, H.C.F., factors and fractions displace algebraical expression, and the application of algebra for a similar reason.

It is hard to understand why arithmetic, algebra, and Euclid have to be taught as three separate sciences for examinations, why boys are forbidden to arithmetise algebra and Euclid and to algebraise Euclid and arithmetic, or, in other words, to deduce particular conclusions from general and to induce general from particular. All schoolmasters know that their great difficulty is to teach boys to think, and that when this is successfully accomplished methods are easily learnt and remembered; this being so, why are methods insisted on before principles and clear thinking?

Euclid's propositions would be no less valuable as an education in deduction if it were clearly realised, which is not always the case, that his general deductions are true of particular lines, angles, and areas expressed in feet, degrees, and square feet respectively. The inference of algebraical formulæ, the tracing of curves from particular data, as suggested by Professor Perry, and easier work of the same kind would give some training in induction, which is more useful than training in deduction for giving originality and virility.

As a method of encouraging elasticity in master and boys, giving latitude in mathematical courses, and eliminating many of the faults enumerated above, I venture to suggest to school examining boards the following changes in their elementary mathematical papers:—

(1) Allow algebraical methods in the arithmetic papers.

(2) Substitute, or allow in the place of the papers in Euclid and algebra one or two general papers containing questions in algebra, geometry, trigonometry and mechanics.

It is more than probable Euclid would still be taught to classes preparing for an examination of the kind suggested, unless a good standard geometry is produced, but a knowledge of all proofs would not be required of a boy more than once or twice. In the time saved his truths could be applied in the study of mensuration, trigonometry and mechanics.

In the March *SCHOOL WORLD* mathematical masters are criticised by university tutors because their pupils do not think, and by professors of engineering colleges because they cannot apply their mathematics. I have endeavoured to show that these faults are largely due to school examinations, and I ask those of the critics who are partly responsible for these examinations to consider whether a great part of the blame ought not to rest on their shoulders.

We want guidance from eminent mathematicians, and not criticism only; we have to correct the faults in our teaching, and, at the present time, to satisfy two distinct needs. Suggestions of how this can be done in one mathematical course will, I feel sure, be of great interest to a large number of schoolmasters.

Trent College,
Derbyshire.

G. HEWLETT.

A Parent's Views on Home Lessons.

THE articles on home lessons contributed to your April number by the Rev. C. W. Bourne and Mrs. Woodhouse lead me to hope that you will permit a parent to consider the matter from his point of view. Both Mr. Bourne and Mrs. Woodhouse point out the importance of making the mental work of a child depend upon his physical condition. This would be excellent if it were practicable in large schools. In no schools known to me has any attempt been made to do this. The child has had to do the work of his form both in school and at home; and I cannot see how any other plan is possible. There may be teachers who make such a close study of their pupils' health as is suggested, and regulate the work accordingly, but they have not been in schools I have known. On the other hand, when a child has been home for a few days on account of

illness, he has had to take on his full tasks, if not more, immediately he returns.

But I do not wish to appear to be opposed to the principles laid down by your two contributors; for they seem to me to be most reasonable. All I wish to say with regard to these generalisations is that they certainly do not represent the condition of things in the average secondary school. My own views may be expressed in a few lines, and I give them merely as statements of fact derived from personal observation.

(1) Home-work is not often done satisfactorily without assistance by boys under twelve. If children are left alone they get through their home-work in a very short time, and they take no thought for the morrow, when most of the arithmetic or other mathematical work will be found incorrect, or their other exercises full of mistakes. The only way to prevent this is for someone to supervise the work while it is being done, or before it is entered in the exercise-book.

(2) Home-work prevents a boy from idling about, it is true, but it also prevents the boy with natural aptitude in any direction from developing it. I suggest that at least one evening in each week should be given to children to do what they like for home-work. The work could be shown up, or the parent could certify in the exercise-book that something had been done, but the subject should be left to the individual pupil. Some interesting particulars concerning the tastes of different children might thus be obtained.

(3) The value of the home-work done by young children without assistance is so small that the trouble of setting and examining the work, and of doing it, far exceeds the gain.

(4) The associations of home life are usually not conducive to serious study. Few children care to settle down to work while other members of the family are enjoying a little music in the winter or are in the garden in the summer.

(5) To thoughtful children evening work is often a great worry, and has an injurious effect upon their health in one way or another.

(6) By filling up most of a child's time with work in school and out, everything to do with books and learning is regarded as a task, and a distaste for school subjects is created.

(7) Parents who are able to help with home-work would usually prefer to teach their children something outside the narrow limits of school work, and those who are not, look upon the work as an annoying imposition, and grumble about the unreasonableness of expecting a parent to do the work he pays a teacher to perform.

Southampton.

CHARLES GILES.

The Franco-English Guild at Paris.

MAY I ask you, in the interest of English teachers and students intending to visit Paris, to be good enough to make known a fact which may be of great moment to them? The Franco-English Guild, of which Miss Williams is President, which hitherto has been obliged to restrict its services to women, is now opening a section for men. This new step has been taken on the suggestion, and with the active co-operation, of the "Comité de Patronage des Etudiants Etrangers à la Sorbonne," a Committee which has as its President M. Casimir Périer, and counts among its members most of the leading men at the Sorbonne. M. Léopold Sudre, Docteur-ès-lettres, the distinguished philologist, is to be the "directeur des études" of the men's section of the guild. Englishmen will be able to obtain advice and information not only about their studies, but about many other matters which concern foreigners in Paris, by applying to the Secretary, the Franco-English Guild, 6, Rue de la Sorbonne, Paris.

The Owens College,

Manchester, March 29th.

H. L. WITHERS.

The Nature-Study Exhibition.

THE courteous reference in your last issue to the above brought me many inquiries. May I now be permitted to state, for the convenience of your readers, that the Exhibition will be held at the Royal Botanic Gardens, Regent's Park, on July 23rd and following days? It is desired that it should be as representative as possible, and, to judge from the promises of co-operation received from representatives of every branch of education, the present appears to be a singularly opportune moment for such an exhibition. Probably no subject has of late attracted wider notice throughout the world than Nature Study: it is generally felt that it has a special value of its own in the development of certain faculties, quite apart from its scientific importance, but there is no agreement as to its exact place in the curriculum of an ordinary school. Our aim, therefore, is to illustrate the best methods of instruction, and to concentrate attention upon what is practicable and expedient. Already we are assured of specimens of the work done in every grade and type of school, not merely in the United Kingdom, but in the colonies and the United States.

I shall be glad to furnish anyone with further particulars, and should be grateful for the names of those to whom special invitations to exhibit ought to be sent. This is particularly desirable in the case of private secondary and preparatory schools, to some of which circulars may not yet have been issued.

In the meantime, I may mention that the arrangement of the exhibits will be under the supervision of Mr. H. M. Cundall, of the Victoria and Albert Museum; Mr. A. T. Simmons; Mr. Sowerby, Secretary to the Royal Botanic Society; and Mr. A. Taylor, Sub-Inspector, Board of Education.

And that Mr. A. D. Hall, Principal of the South-eastern Agricultural College, Wye; Professor Lloyd Morgan, F.R.S., Principal of University College, Bristol; Professor Miall, F.R.S., of the Yorkshire College, Leeds; and Professor Wallace, of the University, Edinburgh, have kindly consented to act as judges.

Stratton,
Near Cirencester.

JOHN C. MEDD,
Hon. Sec.

The School World.

A Monthly Magazine of Educational Work and Progress.

EDITORIAL AND PUBLISHING OFFICES,
ST. MARTIN'S STREET, LONDON, W.C.

Contributions and General Correspondence should be sent to the Editors.

Business Letters and Advertisements should be addressed to the Publishers.

THE SCHOOL WORLD is published a few days before the beginning of each month. The price of a single copy is sixpence. Annual subscription, including postage, eight shillings.

The Editors will be glad to consider suitable articles, which, if not accepted, will be returned when the postage is prepaid.

All contributions must be accompanied by the name and address of the author, though not necessarily for publication.

The School World

A Monthly Magazine of Educational Work and Progress.

No. 42.

JUNE, 1902.

SIXPENCE.

THE TEACHING OF MATHEMATICS AT PREPARATORY SCHOOLS.

By CHARLES GODFREY, M.A.

Senior Mathematical Master at Winchester College.

IT would probably be of advantage both to preparatory and public schools if there were a better understanding between the two bodies as to the stage at which various subjects should be taught. In a recent publication of the Board of Education ("Preparatory School for Boys," vol. vi.), a series of essays by preparatory-school masters, almost every writer lays stress on the fact that the curricula of private schools are determined by the requirements of public schools. This consideration must be the present writer's excuse for venturing to deal with a subject of which he has no direct knowledge—the teaching of mathematics in preparatory schools. Necessarily, he cannot speak for more than one public school; but he believes that most of the views he expresses will be found to be in general accord with the report of the Mathematical Association Committee, a body in which most of the chief public schools are represented.

I.—GEOMETRY.

The present plan is to begin with Euclid pure and simple at the age of 12 or earlier. Under this system it is to be feared that most boys fail to obtain a knowledge of geometry, though they may learn to write out propositions.

To put the matter bluntly, the average boy ought not to do any Euclid at his preparatory school.

This dogma is not meant to apply to the boy of scholarship abilities, who will, of course, begin every study at an earlier age. Still less is it asserted that the study of *geometry* should be postponed to the public-school stage. On the contrary, it is the writer's opinion that geometry may be begun at an even earlier age than is usual.

The only kind of geometry for which an average boy is ripe before the age of 14 is experimental geometry—drawing, measuring, and discovery. Naturally he will not discover things very quickly, and the process of discovery ought not to be

quicken unduly by too many direct statements on the part of the teacher.

When a boy has done a sufficient number of exercises like this—"Draw a triangle whose sides are 5.3 cm., 6.7 cm., 4.25 cm.: measure the angles in degrees, and add them together"—he may, perhaps, have taught himself a few important things about triangles. Assuming that one or two impossible cases have been introduced, he may have decided that the longest side must not exceed the sum of the other two sides. He will probably have noticed that the sum of the angles hovers round the value 180°. He may be led to notice that the longest side is opposite the greatest angle, and so forth.

By extending and varying the exercises the teacher will gradually lead up to the generalisation that three data are sufficient for the construction of a triangle; that two data are not enough; and that four data lead to serious difficulties.

The above is an instance of what is meant by the term "experimental geometry." Even this elementary set of exercises postulates a fair amount of previous work: a boy cannot draw a line of 4.25 cm. satisfactorily without a good deal of practice; and the process of measuring an angle is not free from pitfalls.

It is not proposed to attempt to outline, within the limits of the present paper, a course of experimental geometry. Such a course is being arranged in text-book form by Mr. Eggar, of Eton. In the meantime, we have two capital books in Hamilton and Kettle's "First Geometry Book" (Edward Arnold, 1s.); and Campbell and Phillip's "Observational Geometry" (Harper Brothers).

It may be useful to specify what is necessary and sufficient in the way of instruments. The set used at Winchester contains:—

(1) A hard pencil. This must be kept carefully sharpened; not to a point, which wears quickly, but to a chisel-edge. A piece of glass-paper is a useful adjunct to a box.

(2) A pair of compasses. The steel point ought to be of moderately good quality; with a blunt point it is difficult to do good work. The compass ought to take a pencil of ordinary size. If the pencil is kept in by means of a screw, there must be some arrangement to prevent the screw from coming out entirely; otherwise it will be lost.

(3) A pair of dividers with good points. Dividers

rather than ruler should generally be used for measuring or transferring distances.

(4) A set square.

(5) A graduated scale with bevelled edges. It is important that the scale should be graduated in the best way. On one edge should be inches and *tenths* (not eighths or twelfths); on the other edge centimetres and millimetres. Manufacturers have an unfortunate way of labelling centimetres "metre"; this confuses the pupil.

Boys should be trained to be equally familiar with inches and centimetres. Decimals should be used always, vulgar fractions never. The first place of decimals can be read directly from the scale; with a little practice the second place of decimals can be guessed.

(6) A semi-circular protractor for measuring angles: the rectangular shape is unintelligible to the young.

Such a box can be bought for five shillings, or less. With these instruments it is not difficult to obtain an accuracy of 1 per cent. Of course it is unnecessary to ink in the figures.

A boy may be provided with this equipment as soon as he is old enough to sharpen a pencil; and before he comes to Euclid or a public school he ought to have obtained a fair knowledge of the main roads of geometry. The object of early geometrical teaching should be to interest, and to arouse the spirit of discovery. Didactic teaching should be avoided; well chosen exercises will speak for themselves.

Formal proofs must not be demanded or given; but, of course, constructions should not be taught as mere rules. It is easy to convince a sensible child of the reasonableness of the simple constructions. To take the case of the bisection of an angle; the first step is to cut off equal lengths from the two legs of the angle. What is the object of this step? A boy will soon be persuaded of the necessity of the proceeding if he tries to perform the rest of the construction without making the legs equal; he will find that the resulting line is not in the middle. A little talk about symmetry will clinch the matter; though, of course, such a formidable word as "symmetry" would not be used at first. If it were put to him in the light of treating both legs of the angle fairly, not favouring one rather than the other, he would be fully satisfied. The fact is that most things in elementary work depend on symmetry. Not everything, it is true; but such a construction as II. 11 must be postponed to a stage when a wider knowledge of theory has been gained.

The elementary constructions should be practised till they are as familiar as the multiplication table. Some of them admit of various methods; perpendiculars and parallels can be drawn either by Euclid's method, or, better, by sliding a set square on a straight edge. A boy will probably find out a way for himself if he is allowed to try; later on he can be guided to the best possible way.

He should be encouraged to test the accuracy of his drawing by measuring his result. There will generally be a small error; so tell him that he may

be pleased with his drawing if the error is under 1 per cent. of the thing he is measuring. Arithmetically nothing could be better than the habit of roughly reducing the error to a percentage of the whole measurement.

Another way of rendering the work interesting is to direct the pupil to make estimates beforehand; for instance, in constructing an equilateral triangle, let him begin by putting a little cross where he judges that the vertex will fall. Exercises such as the following give excellent training: "Using your set square only, draw a straight line which you take to be four inches long, 5 centimetres long; measure what you have drawn. Draw a line and guess its length in inches, in centimetres; then test your guess. With ruler only draw an angle of 50° ; test it. What is the size of the angle I have drawn on the black-board?" (A black-board protractor will be needed if this question is to be settled.)

As to the order in which constructions are to be taken, we have a free hand. Euclid's order is not necessarily the best. For instance, the problem of circumscribing a circle to a triangle can be dealt with as an exercise on the fact that the *locus* of points equidistant from two given points is the perpendicular bisector of their join. The problem of inscribing and escribing circles to a triangle will come naturally at about the same stage. Probably the question of order will settle itself in a few years' time by a process of survival among competing text-books. In the meantime teachers have to use their own discretion. Some constructions can be based on common sense; others need some theoretical knowledge.

To illustrate this point, let us take the case of *area*. Euclid's three problems I., 42, 44, 45, seem to be nothing but a cumbrous way of dealing with the area of a polygon. These problems ought to be omitted, and replaced by the draughtsman's method of reducing the number of sides of the polygon one by one till he gets a triangle of equal area.

Thus, in Fig. 1, the pentagon ABCDE is reduced to an equal quadrilateral ABCF by drawing DF parallel to CE to meet AE produced.

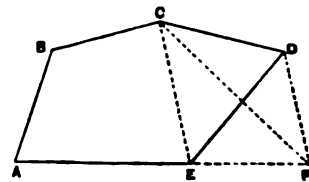


FIG. 1.

A repetition of the process reduces the quadrilateral to a triangle; the base and altitude of the triangle are measured; and the area is half their product.

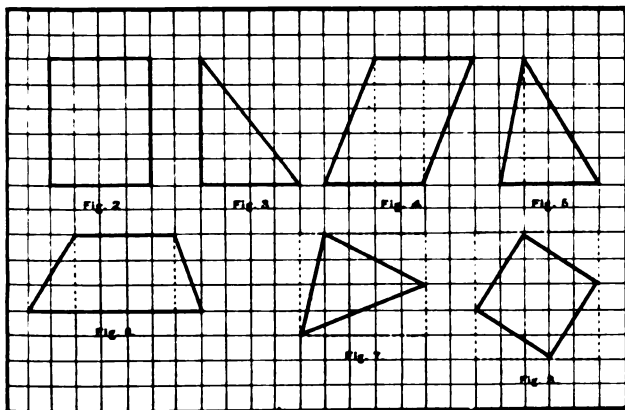
Now this is much simpler and more useful than Euclid's way, and can be practised as soon as a boy knows that triangles on the same base and between the same parallels are equal in area. But of course it would be absurd to bring it in sooner. So the question arises, how can a boy obtain a

knowledge of this interesting fact without toiling up the steep and thorny way of Euclid I. 1-38?

The best way to give a child an idea of what area means is to make him draw figures on square-ruled paper and count the number of squares in the figures. A graduated series of exercises will readily occur to any practical teacher. Begin with rectangles, but never tell the boy to multiply together the number of units in length and breadth; he will soon discover this as a way of shortening his counting. At first it is well to use the common squared paper of exercise books in which the size of the squares has no particular relation to an inch; then go on to paper ruled in linear inches and tenths. On this are large squares which the child will come to recognise as square inches; and small squares each of which is 0.01 of a square inch. He should be directed to draw a rectangle whose sides contain an exact number of tenths (say 15 and 24); to count the number of little squares in it (360); and to ask himself how to find the number of square inches (3.60). Not till this stage (which may come after two or three lessons) should it be pointed out to him that he would have obtained the right number of square inches by multiplying together the number of inches in the length and breadth (1.5×2.4).

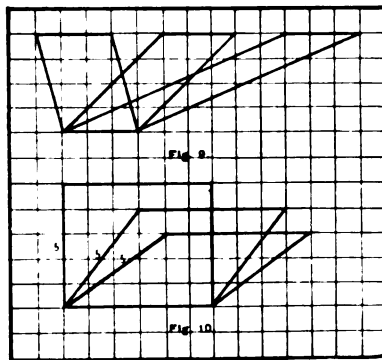
When he understands the rectangle he may go on to the right-angled triangle, which he will see to be half a rectangle. And now the area of any rectilinear figure can be found at once by means of rectangles and right-angled triangles. The figure must simply be cut up. It is often useful to circumscribe a rectangle to the figure, and regard the area of the figure as that of the rectangle *minus* so many right-angled triangles. (Figs. 2-8.)¹

When the boy has been familiarised with the idea of area by a varied course of this work (and he



will like it) the time has come to lead him to a knowledge of the properties connected with the areas of triangle and parallelogram. The writer has found it a good plan to set groups of two or three figures on the same sheet of squared paper,

each group telling its own tale (Figs. 9, 10). The fairly intelligent boy will approach the subject with a conviction that the area of a parallelogram depends solely upon its perimeter; it is therefore advisable to give parallelograms of the same area



and different perimeters (Fig. 9); and again of the same perimeter and different areas (Fig. 10): he should measure the perimeters. Of course, the properties of parallelograms can be illustrated quite simply with a sheet of paper and a pair of scissors.

For the few boys who will get as far as Euclid a simplified course of formal geometry is wanted. Such a course is provided by the suggestions of the Mathematical Association; it is to be hoped that public schools will accept the essentials of this report. As the report has already been published,² a very brief sketch will suffice here. Definitions are to be taken as required, not in a lump at the beginning. A considerable number of dull and obvious propositions are to be omitted, especially in Book III. The greater part of Book III. (up to Prop. 35) is to be read before Book II. In Book II. the diagonal is condemned. Book IV. is to be treated as geometrical drawing. Euclid's theory of proportion is to go, and to be replaced by easy algebra; though it will be seen that this does not necessarily affect the proof of any proposition in Book VI. except the first and the last.

(To be continued.)

A Child's Life of the King from his Birth to his Coronation. By Alton Towers. Illustrated by Edmund Smyth. 132 pp., 32 coloured pictures. (Heinemann.) 1s. 6d. net.—This little volume is for infants who are fortunately not critical, or else they would wonder why the baby King was so much bigger at a month old than when ten weeks of age. We should much like His Majesty's opinion of the picture on p. 55. Parents

desiring to nurture a sympathetic spirit towards royalty, or to remove the glamour that hangs about the life of a king, might like to read the book to their babes and sucklings. Children are often interested by incidents and pictures which to adults seem utterly common-place.

¹ A blackboard ruled in squares is almost indispensable. (Geo. Hammer, Strand, London, about 12s.)

² In *The Mathematical Gazette*. A descriptive article referring to the Report will appear in the July number of THE SCHOOL WORLD.

THE CORONATION OF KING EDWARD VII.¹

By A. JOHNSON EVANS, M.A.

MORE than sixty years have elapsed since Westminster Abbey saw a coronation, and there are few who can remember the accession of a British sovereign. The subject, therefore, is quite a fresh one for our generation, and many are the writers and publishers who have thought there would be a market for instruction in coronations and their accessories. Our daily papers are constantly giving us information on things new and old, and many books have been published. Of the five which we have received, Mr. Pascoe's is a special edition of an annual, "London of To-Day." It is written in a smart journalistic way, and is evidently intended for visitors from the Colonies and the U.S.A. who, with plenty of money, wish to know how best to enjoy themselves in London at the end of this month. Besides the Coronation, the sights and pleasures of London are unfolded, and there is a number of illustrations, the most interesting of which are coloured reproductions of the regalia.

Mr. Beavan's is a simpler but interesting book, containing, besides what would be naturally expected, chapters on the associations of Westminster Abbey, on the privileges of prelates, &c. It has ten good illustrations. "Crowns and Coronations" is a reprint of a book first published in 1884 by an antiquary full of curious learning on coronations of all times and places. The illustrations are mostly woodcuts and not numerous, but the letterpress is well worth reading. "Debrett's Dictionary" is, as its name implies, an alphabetical arrangement of information bearing on the present Coronation, with, as we should expect from the title, much genealogical, heraldic and other lore. The volume from the Religious Tract Society is a simply written compilation from various sources, treating the Coronation from a Protestant point of view. Let our readers take their choice among these and the many other books published on the occasion, according to the time and money at their disposal. The information conveyed is much the same in all of them.

What is this ceremony of coronation which is, whether we will or no, occupying our attention so much this summer? And why is it that we have a double feeling about it, that, while we cannot but regard the long service in the Abbey as a solemn act of Church and State, there lurks yet a suspicion that the whole affair is simply a grand show without any real meaning? Let us endeavour shortly to answer these questions.

Both the kingship and the coronation are survivals of a distant past. They have, it is true, survived, but that must have been in virtue of adapting themselves, at least to some degree, to the circumstances of our age, so different in many ways from that in which these institutions originated. And first, as to the kingship. We can trace it with more or less distinctness as it emerges out of the military leadership of the tribes that invaded these shores in the fifth and sixth centuries. The military aspect of the kingship has never ceased. Woe to the land when the king is a child or is otherwise incapacitated for war! Even Queen Victoria had a military funeral. Was she not a soldier's daughter? The kingship having become an established institution grew and took to itself dignities and powers. The person became sacred as early as Alfred's time, at least so far that death was the penalty for king murder. Slowly it evolved powers of jurisdiction and of landownership till it stood pre-eminent above all other government institutions in the Norman period. John marked its development in this direction when for the first time in English history he called himself on his great seal King "of England," no longer "of the English." But the greatest height was not yet reached. At the head of Christendom stood the Emperor and the Pope. Of the former we in England were always all but independent. Being an island, there was always a feeling that we were *alter orbis*, another world, where the Holy Roman Emperor did not rule as he did on the Continent. Against the Pope, too, our kings almost always maintained an attitude of respectful semi-independence—an attitude peculiarly expressed by the ignoring as far as possible, on the part of all our historians, of John's famous submission, and by the formal repudiation of the Pope's feudal authority by Edward III.

It was left, however, to Henry VIII. to settle once for all (notwithstanding the reigns of Mary I. and James II.) this mediæval quarrel. Independent henceforth of Pope or Emperor, the Tudor gave himself the titles "King of Ireland" and "Majesty," and, under God, the King of England and Ireland was supreme head both in Church and State. So was the rise, and the Tudors governed as well as reigned. Theirs was an Imperial rule in all senses of the word. In the following century the decline began. Beginning with wrangles over apparently small legal difficulties, the quarrel between the kingship and the now self-conscious parliament was intensified by religious disputes and culminated in attempts at mutual destruction. Answering to the eleven years of "personal government" were the eleven years of the "Commonwealth," and the result in 1660 was a drawn battle. Kingship survived, in form as strong as ever, but its old autocratic power was gone. 1688 showed that it could not have its way, as the Tudors had had theirs, in matters of religion, and the foreignness of the first two Georges caused a neglect of the kingship by its possessors that was fatal to their authority. George III.'s rule, though more direct than that

¹ "The Pageant and Ceremony of the Coronation." By C. E. Pascoe. 534 pp. (Simpkin, Marshall.)
 "Crowning the King." By A. H. Beavan. 210 pp. (Pearson.) 2s. 6d.
 "Crowns and Coronations." By W. Jones. xxx. + 551 pp. (Chatto and Windus.) 3s. 6d.
 "Debrett's Dictionary of the Coronation." xvi. + 193 pp. (Dean and Son.) 2s. 6d. net.
 "The Crowning of our Kings. From Ethelred II. to Edward VII.," 148 pp. (Religious Tract Society.) 2s. 6d.

of his grandfather, was maintained at great cost, and the Reform Acts of 1832 placed the English kingship in a position in which it had never stood before. Only the patient wisdom and long endurance of Victoria could have saved for her son and successor whatever political influence he now possesses.

But this long rise and decline has been so gradual, marked by no catastrophes, that though we are aware that no one could now speak of kingship as, *e.g.*, Shakespeare does or any pre-Cromwellian writer, yet in form the office is still as high and lifted up as ever it was. On the 26th of this month the Bishops will pay allegiance, the temporal peers will do homage, to the person of King Edward VII. Prayers will be offered that he may live long, he will be exhorted personally to do justice and exercise mercy, as if our safety and welfare, corporate and individual, depended on his life and good conduct as much as they did, in Plantagenet or Tudor times, on the character of the then monarch for the time being. And yet we are not without recent signs that the old order has really passed away. The present Parliament is not of King Edward's summoning, for in 1867 it was enacted that henceforth Parliament should not cease at the demise of the sovereign. It is true that Q.C.'s are now K.C.'s, but none of them was refused a new patent, and the members of the Cabinet managed to retain their offices and so avoid an appeal to their constituencies. We used to hear during Victoria's reign that it was here because a woman was reigning that the "hereditary" ruler was so ineffective, but now that we have a king, "like unto the nations round about us," there seems no sign of a revolution. Some even hoped that King Edward would personally put an end to the Boer war, but that is being settled, if at all, on the South African veldt. Evidently the course of events is not affected by the change of sovereign. What, then, is the essence of the change that has come over our kingship? Space prevents us giving our reasons for the answer, but we may state it in a few words. Whenever an office becomes hereditary, it tends to become ornamental. Alongside of it, performing its ancient functions, rises an office elective in form or in fact. In this case, alongside the "hereditary" kingship has arisen the premiership and the cabinet. These together govern, and, to a large but unknown extent, reduce our sovereign to the position of a *roi fainéant*.

Now the Coronation Service, the object of which is to exalt the king, naturally ignores all this decline of the monarchical power. We might almost say it is its *raison d'être* so to do. In the midst of a generation which has ceased to believe in old ideals, which has even forgotten many of them, this ceremony, most conservative among all the conservative institutions of a once conservative people, exists to remind us of what we once were, what beliefs we once held, what a great and glorious institution kingship once was amongst us. For this object new regalia were made at the Restoration of 1660 and called by the old names,

for this the Abbey is rearranged and the clergy of the established church of the "predominant partner" are gathered together. And the various ceremonies of the coronation in their nineteen sections bear witness to ancient thoughts and ways, to historical events in the successful struggles of the kingdom and kingship. Of other and later struggles, of decline and retreat, it knows nothing.

The throne, the crown, the cry "God save the King!" date from the earliest times, when the successful leader in war was elevated on a shield or on the shoulders of his fellows and hailed "Kin-ing" or man of the tribe. The presence of the archbishops and bishops reminds us that our pagan forefathers were converted to Christianity, to a Christianity which had inherited Jewish ideas and forms, with its memories of Solomon and of Josiah. Hence the ceremony is in a church, the symbols of authority are taken from an "altar," the king is anointed with oil, and crowned by clergy who represent God, from whom all things, even kingship, comes. The Norman period and its ideals, even its struggles and compromises, are represented. Because Anselm contended with Henry I., the bishops promise only to be "faithful and true," while the laymen promise in addition to be the king's "liege *men* of life and limb." A bishop is no man's *man* (*homo*). He, therefore, does no homage in the proper sense of the word.

The ancient kingdom of England was "another world"—had not Urban II. called Anselm *alterius orbis papa?* and in 1533 had it not been "manifestly declared by divers and sundry old authentick histories and chronicles that this Realm of England is an Empire?"—therefore, his *Majesty*, like the Emperor, has a quasi-clerical office, and is invested, like any bishop, "*per annum et baculum*," with ring and staff. The crown and robe, too, are imperial, and the orb is carried as a symbol of "world"-wide sovereignty. But *this* Empire-Church is Protestant, whose religion is the Bible and the Bible only, and, therefore, a copy thereof is presented as "the most valuable thing that this world affords."

Thus the Coronation Service typifies the rise of the monarchy till the reign of Henry VIII. and the Tudors. But there it stays. It knows nothing of later developments. The union with Scotland, effected by the first Stuart's accession, is typified only by the presence of the stone captured by Edward I., and though there is an established church in Scotland as well as in England, the king is not asked to defend that as he is asked to defend this. It is true he is called King of the United Kingdom of Great Britain and Ireland and the Dominions thereto belonging, but it is only the clergy of a part of the inhabitants thereof that take part in the coronation, and he is called Edward VII., as if he represented merely the England of Edward VI., not the British Empire of to-day.

And as there is thus little, if anything, corresponding to the growth of the Empire, so there is just as little corresponding to the modern de-

velopment of the constitution. The members of the Cabinet may be there, but only as onlookers, and that not in virtue of their membership of that famous committee; Parliament as such takes no part in the ceremonial but that of spectators, though it is in virtue of an Act of Parliament (the Act of Settlement, 1701) that Edward reigns. The Litany still prays for the government in the words of Tudor times, for bishops, priests, deacons, privy council, nobility, and magistrates, without a word for parliament or ministry. In a word, the Coronation Service in its form is a service of the Crown and of the Established Church of England, and conservative England loves to have it so. Into those forms we read the newer meanings. Though it is only the favoured few who will be permitted to shout in the King's immediate presence, the kingship is, we rejoice to say, "broad based upon the people's will." The Coronation is more than the service in the Abbey, it is the crowds who will line the streets of the metropolis on the 26th and 27th of June. It is the roar of the artillery, the bonfires and illuminations, the civic pageantry and charity which will be displayed as simultaneously as the size of the Empire admits. Not in the Abbey, where conservative instincts reign, but in the hearts of a loyal (should we not say royal?) people throughout the world the greatest prayer will go up—

GOD SAVE THE KING!

SOME SUGGESTIONS FOR TEACHING MENSURATION AND SURVEYING.¹

By S. DE BRATH, M.Inst.C.E.

Headmaster of Preston House School, Bookham.

II.—SURVEYING AND LEVELLING.

MATTER and Method.—It will be readily admitted that school is not the place to train surveyors. We have, therefore, to regard the purpose of our work as an endeavour, by means of applied mechanics, to restore part of that connection with daily life and the real world which over-formalised mathematical tuition has so powerfully tended to obliterate.

The instruments required, though few and simple, are necessarily somewhat more expensive than those required for the mensuration course, but I would again most strongly deprecate the attempt to dispense with them by attempting to teach even the elements of surveying from books alone: to do this is to stultify the whole purpose of the course. Here, again, it is the reaction between the concrete and the abstract, between

mathematical principles and their practical application, which is of value in the present connection, and to dispense with practical work is to lose this reaction altogether.

The instruments required, in addition to the drawing instruments already supposed to be in the possession of the student who has completed his course of mensuration, are, for each party of eight:—

Two 66 ft. chains, and 10 arrows.

Two 50 ft. tapes for taking offsets.

A working model theodolite.

A plane table with compass and sight rule.

A water level, and two staves graduated in feet and tenths, iron shod.

Twelve 8 ft. rods painted in bands of black and white 1 ft. wide.

The cost of this teaching apparatus may be about £7, a large sum, I know, where the money spent on cricket runs well into three figures, and on school buildings may easily extend to six; but, I submit, a necessary expense if the instruction is to be real and valid. For this instruction books are not needed. The teacher who wants a compendious manual of surveying for his own use will find it in Baker and Dixon's "Land Surveying" (Crosby Lockwood & Co., 2s.), but the more we keep books out of the hands of the average student the quicker will he learn to use his eyes and hands, instead of learning merely to talk about how to use them.

The first lesson should be in the field, and should apply two clear mathematical principles:

(1) That every point in the boundary of our field can be defined by its position relatively to other points or lines in or near it, and in this way only.

(2) That two points determine a straight line, and is "ranged" or set out by means of such points and intermediate ones all marked by vertical rods. The ability to range straight lines with the rods by eye alone is of the utmost importance. When facility has been gained in ranging true lines in any given direction, the method of taking offsets (ordinates) may be explained, and one boundary of the field defined by reference to a straight line run a few feet away from it. Or, all the boundaries of a garden or small paddock may be defined by offsets from a straight line run across its greatest diameter.

Representation to a given scale is the next matter. The sense of this may conveniently be deduced from Euclid VI. 2, *vide* "Castle's Practical Mathematics for Beginners" (Macmillan), p. 41. The construction and meaning of scales is well treated in many books, notably in "A Systematic Course of Geometrical Drawing," by T. A. V. Ford (Geo. Philip & Son, 3s. 6d.). A few lessons on the technicalities of map drawing or "plotting" will be necessary at this point. Mr. Ford's book gives some of them in the introductory chapter. Students already trained in geometrical drawing will not need them.

Chain Surveying, the next and most important part of our subject, depends upon the practical ability to range and keep a line and to offset from

¹ A new section including Mensuration and Surveying has been added to the Syllabus for Senior Students in the Cambridge Local Examinations, December, 1902.

it at right angles, and upon the mathematical principle that all triangles whose sides are of given lengths are identical. It is clear, therefore, that by setting out a triangle or series of triangles we

Typical Field Book

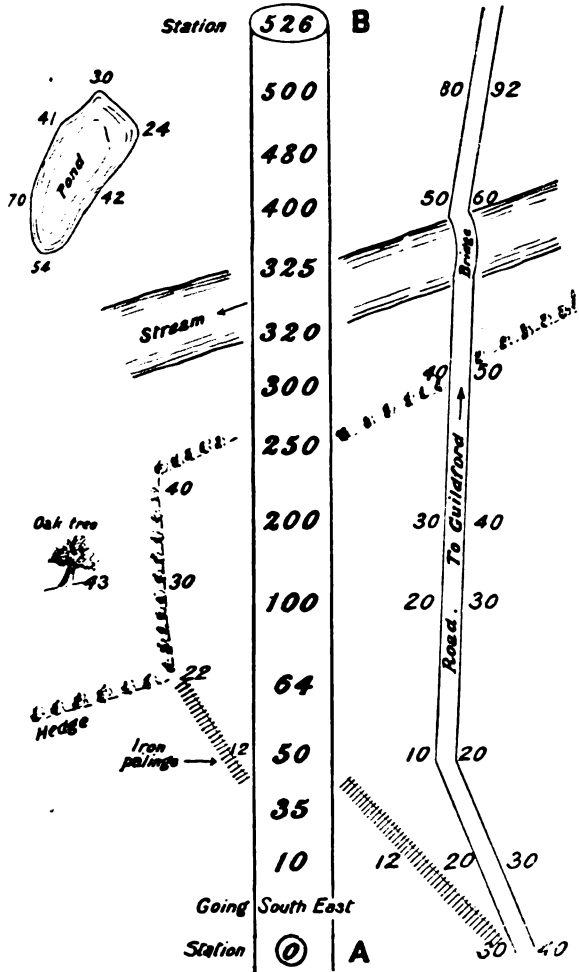


FIG. 1.—A Typical Field Book.

get an absolutely fixed frame, which serves as the skeleton of our survey. From the sides of this frame offsets may be taken to the actual boundaries of the field whether these be straight or not. Good examples of simple chain survey will be found on p. 108 *et seq.* of Stevens's "Elementary Mensuration" (Macmillan) already referred to. The field book may be kept as shown in Fig. 1. The principle is that the central column represents the chain, and the width on the paper is ignored, and conventional representations of hedges, palings, streams, paths, &c., are drawn at its side with the offsets to them placed marginally. A little careful study of the typical field-book here given will show all that is meant. The practical detail can only be learned on the ground, but the following hints may be useful:—

- (1) Work in parties of four students, relieved by other four.
- (2) Make a rough sketch of the area to be measured, and mark the most suitable triangles.
- (3) Keep these as nearly equilateral as may be.
- (4) Mark the angles by rods stuck upright in the ground.
- (5) Keep the skeleton lines near the boundaries to avoid long offsets.
- (6) The front chainman holds his arrow *outside* the chain handle with his thumb.
- (7) The rear chainman gives the line, directing by the rod fixed into the ground at the forward station.
- (8) See that there are no kinks in the chain.
- (9) The student who keeps the field book walks by the rear chainman, and takes the arrows to the front chainman at each tenth chain.
- (10) Fourth student takes the offsets; and must be careful to measure at right angles to the chain.
- (11) Run tie lines to check the work.

The mathematical principles involved in chain surveying are, of course, the same as those used in mensuration of triangles. What to offset to is determined by the scale of the map. No ordinary drawing, certainly no boy's drawing, can be relied on to under $\frac{1}{320}$ th inch. If, then, the scale to be used in drawing the plan is $\frac{1}{320}$ th inch to the foot, it is no use to offset to fractions of a foot. If the scale is larger, half and quarter feet may be given.

Acreeage is computed by the ordinary properties of triangles, using one link as the unit. One chain = 100 links, therefore one square chain = 10,000 square links, and 10 square chains, or 100,000 square links = one acre. We therefore compute the areas in square links and point off five places, e.g., 796,324 square links = 7.96324 acres. A few practical exercises will teach more than hours of bookwork.

Angular Measurements are educationally the most valuable part of a course in surveying, because of their wide theoretical application. The student must be familiar with the concept of a plane angle as generated by a moving line, and with the division of the four right angles at the centre of a circle into 360°. He should then realise that the angle between any two visible objects is that formed by a line rotating from the point at which he is standing to pass through each in succession. These concepts appear exceedingly simple, and so indeed they are, but as a matter of fact they are often not formed, and their absence accounts for many mathematical difficulties experienced by boys. It is often of assistance to draw on brown paper a large protractor of some 3 ft. radius (divided in degrees), and to place this on the ground at the point of sight, marking out the angle between any two prominent objects with thin, straight rods.

The explanation of the working model theodolite, as essentially a movable protractor in which a ray of light axial to the instrument serves as a pointer, follows by a natural transition; and familiarity in measuring angles should be acquired before any attempt is made to apply trigonometrical

knowledge. When the students have fully realised the principle of the instrument and are familiar with



FIG. 2.—A Working Model Theodolite (designed by the Author).

the process by which the natural sines and cosines are computed, they may learn to use the angular vernier, reading to five minutes, and to apply the principles on which all angular measurements rest ;—that a point on a plane may be defined :

(a) By a certain distance measured along one of the two bounding lines which enclose a known angle.

(b) By the intersections of two lines each forming a known angle with a base line of known length and drawn from opposite ends of that base line.

The great utility of using an angular instrument, and the vivid interest taken by boys in trigonometrical " heights and distances " when these can be practically measured and computed, is sufficient proof of the value of these measurements. It was after long experience that I decided on the theodolite in place of the apparently simpler compass as an angular instrument. When reduced to its simplest form, the theodolite (measuring angles directly) is much more readily understood by boys than the compass, which can only take angles with the meridian, or " bearings," and is generally used quite empirically. But I am averse to teaching boys anything of trigonometrical survey. The precautions which have to be taken for even fair accuracy are so many, the computations so laborious, so minute and intricate, dealing moreover with but one simple principle—the relation of the side of a triangle to its opposite angle—that the principle is buried under the detail, and lost sight of in the manipulation. Trigonometrical survey is part of the engineer's professional art ; it seems to be unsuited for the school.

The whole practice of angular measurement by intersections as applied to survey might be learned by the use of the plane table and pacing. The theodolite may be used to run a traverse, ending at the point at which it began, and the interior detail filled in with the plane table if thought advisable. But even this I hesitate to include in a school course : it is rather too technical, takes up too much time, and here again, the simple princi-

ples are obscured by the art which applies them. But it is a valuable exercise, is much enjoyed and may perhaps be included. Six periods of three hours each are required if any good is to be done.

Levelling is, however, expressly included in the syllabus. The principle here is a physical rather than a mathematical one. It is that the free surface of a fluid at rest is horizontal. Consequently if a bent tube A B (Fig. 3) containing water be mounted on an axis C, and rotated, the

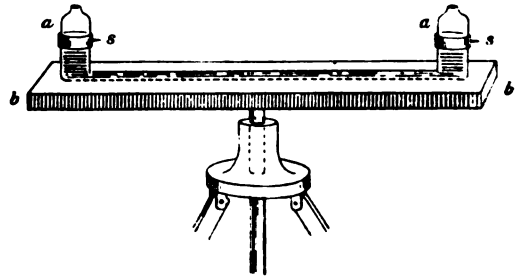


FIG. 3.—Water Level.

aa. Two glass tubes of 1-in. diameter connected by 1-in. tube. Half filled with coloured water and corked for transport. bb. Baseboard. cc. Sliding collars for sighting. Baseboard measures about 2 in. x 15 in. and revolves in a horizontal plane.

line A B (which is necessarily horizontal) will trace out a horizontal plane called the " plane of collimation." It is easy by a diagram to show that this plane would be tangent to the earth at the point in question if the earth were a perfect sphere. On the actual irregular terrestrial sphere this plane will cut vertical staves set up at any points near enough to read the graduations, and the difference of reading will give the difference of level of the two points.

This is the principle which underlies the whole art of levelling, and provided that this principle is clearly brought out, nothing more would seem to be desirable. But there are some valuable and interesting applications follow from it and connect it with the geometrical idea of slopes—so many feet rise to so many feet horizontal—and with the sine, cosine and tangents of angles, and as these involve several successive observations, it may not be out of place that the student should learn how to run a line of levels, using the water level.

Let A B C (Fig. 4) represent the profile of a piece of land whose slope changes at these points.

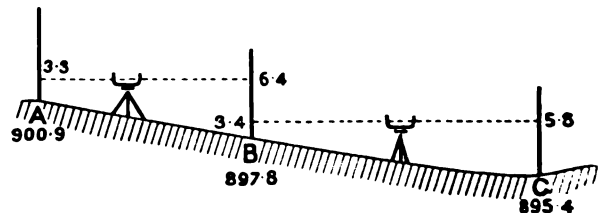


FIG. 4.

Let the level above the sea of the point A be 900.9 ft. Then if a level be set up as shown between A and B, and we read 3.3 ft. in the rod A, clearly the level of the plane of collimation will

be $900.9 + 3.3$, or 904.2 . If we now remove the staff A to C, and place the level between the staves as before, the reduced level of the ground at B is $(904.2 - 6.4) = 897.8$. The new plane of collimation is 901.2 , and the ground level at C is 895.4 . A series of such levels, if the staves are placed wherever the slope of the ground materially changes, will of course give a record from which the "profile" or "section" of the ground may be drawn to scale.

The record is kept as under :—

LEVELS TAKEN..... DATE.....

Staff readings.	Planes of collimation.	Reduced levels.	Chainage.	Remarks.
3.3	904.2	900.9	450	Ordnance survey at A Station B.
6.4	897.8	500	
3.4 5.8	901.2	" 895.4	" 625	Station C.
2.3 2.9 7.8 1.2	897.7	" 894.8 889.9 896.5	650 650 720 840	Plinth " " of house. Change of slope. Station D.

mathematics, be of the greatest use in promoting that action and reaction between concrete and abstract which constitute healthy activity of mind, the end and aim of all rational instruction.

THE TEACHING OF LATIN IN LOWER FORMS.

By W. EDWARDS, M.A.

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IT is time that the supporters of a classical education frankly recognised that comparatively few boys in a secondary school ever gain a real acquaintance with the masterpieces of Greek or Latin literature, or become imbued with the classical spirit from the originals. To justify the retention of Latin as the substantial basis of an educational curriculum we must establish its supremacy as an instrument for the training of the mind. It cannot be too often insisted on that it matters little whether a boy forgets all his Latin or not after he has left school. The virtue is not in the actual knowledge acquired, but in the process.

But it is evident that the value of this training depends in no small degree on the methods employed. A good instrument misused is no better than a bad one. The right method is that of induction by the boys themselves—the "heuristic" method, if you will. The boy must be taught to observe, to collect and arrange his observations, to extract from them a general rule, and to apply that rule and test it by further observations. It is the arrogant claim of Natural Science—a claim not entirely justified by results—that it has a monopoly of this method. The immediate object of this article is to indicate how this method of induction may be applied to one branch of the teaching of Latin in lower middle forms.

The basis of the lesson must be the Translation Book. In the lowest forms a Reader specially prepared is, perhaps, the most suitable, or an easy version of Cæsar, such as "The Invasion of Britain" in Macmillan's series. In a higher form a book of Cæsar is the best. But, whatever it is, the Translation Book is the starting point. The principal rules of syntax must be extracted from the examples which occur in the course of the reading.

The process suggested will be best illustrated by a concrete instance. The question is the translation of the word "any." The particular passage which gave rise to the question was, "*seu quid communicandum, seu quid administrandum videretur.*" After the translation had been worked out, and it had been explained that "*seu*" was equivalent to "*si-ve*," a number of simple, varied Latin sentences was written on the board, each containing "*quis*" in the sense of "anyone." Care was taken to include all the main cases in which "*quis*" might be so used. The more sentences, of course,

It may now be brought out that chaining along A B C will give the distance between these *along the slope*, that the true distance between them is the horizontal distance, and that the difference of level between successive stations divided by the distance along the slope gives the sine of the angle of inclination to the horizon, and that from this the true distance can be found from the cosine of the same angle. Applications of these and a few contours, with the method of indicating slope of ground, may complete the course.

The governing principle throughout should be, I submit, the application of mathematical principles to practice, that by practice these may be more clearly apprehended. No attempt should be made to use telescope, the spirit level with its intricate adjustments, the prismatic compass, or generally, to learn any part of the *art* of surveying where devices to secure accuracy obscure the primary mathematical principles. When the art becomes more prominent than the applied mathematics, surveying becomes part of the engineer's technical outfit and ceases to be a fit matter for school instruction. Not the ability to use instruments for surveying is aimed at, but the familiarity with mathematical principles which will enable this or any other similar art to be readily acquired later. At the same time, if some basis of practical manipulation is not given, the matter becomes yet one more branch of that book knowledge which weighs so heavily on many practically minded boys and leads to a permanent distaste for ordered thought and systematised ideas because associated in their minds with bookwork in which they see no uses and take no interest. The present departure may, by affording a glimpse of the value of applied

the better. The sentences were carefully translated, and the boys were then invited to extract the common element, *i.e.*, the conditions under which "anyone" might be translated by "*quis*." Boys like to exercise their wits, and they soon discovered that either *si*, *ne*, or *num* figured in all the sentences. The rule was thus extracted, that "anyone" was to be translated by "*quis*" after *si*, *ne* and *num*. The process of inductive reasoning had been undergone.

But the rule has now to be confirmed in their minds. How is this to be done? It may sound antediluvian, but for this purpose there is nothing like a rhyme. If the rhyme can be made by the boys themselves so much the better. In this particular case the rhyme made by a boy between twelve and thirteen was:

After *si* (*seu*), *ne* and *num*,
Quis, quae, quid, means anyone.

The rhyme is obvious and defective—not more so, by the way, than many in the accepted grammars. But it sticks. It would take too much time, however, as a rule, to wait for boys to evolve a rhyme during the actual lesson. In more complex cases it is necessary to be provided with a rhyme of one's own; in simpler cases boys may be invited to try their hand at one out of school hours. Some boy is generally keen enough to do so.

To proceed with the lesson. The question at once arises, probably suggested by the boys themselves: "How is 'anyone' to be translated when *si*, *ne* and *num* are not present?" A number of sentences with "*quisquam*" are then set down. It is quickly seen that all these sentences are negative. The rule is extracted accordingly. "*Vix quisquam fecit*" is then written down. Is the rule complete? Does it hold in this case? The answer was not long in coming, that the sentence had "a sort of negative sense." "*An quisquam potest facere?*" This took a little longer, but at last the answer came that the question expected the answer "no." *Quisquam* after a comparative was then dealt with. *Quivis* and *quilibet* were treated in a similar way. The rule was extracted and the rhyme made. The actual rhyme obtained was:

After *si* (*seu*), *ne* and *num*,
Quis, quae, quid means anyone;
Quisquam with a negative,
Ullus is its adjective;
Quivis, quilibet will come
When anyone means everyone.

A defective rhyme, but an effective mnemonic, and not so bad from boys of an average age of twelve.

It remains, however, to confirm the rule by application in *viva-voce* practice. A number of mixed English sentences containing the word "any" in various senses is given, and the boys are asked what Latin word they will use to translate the word "any" in the several cases. The rest of the sentence is left alone. Unfortu-

nately a boy finds some difficulty in grasping at once the bearing of spoken sentences, and to write them down in any number on the board would take an unconscionable time. What is wanted is a number of printed sentences to which one could refer the boys and say, "How is 'any' translated in No. 1, how in No. 2, &c.?" A book on these lines with a very large number of simple sentences to be used *viva voce* would be useful.

The above is no extraordinary example. The method can be applied to most of the ordinary rules. In the simplest and very common cases no rhyme is needed. The rhyme in any case must be regarded merely as a mechanical aid. The boys must not be allowed to magnify it into an infallible oracle.

It is instructive to note the recommendations in the "Curricula and Programme of Work for Higher Schools in Prussia" (Special Parliamentary Reports, vol. iii.). "Rules of syntax to be drawn from the text as required. . . . The method always to be adopted is to start with a number of model sentences illustrating the rules in point, and drawn as far as possible from what has been read, and then, after they have been explained, to have them committed to memory."

In conclusion, the teacher should be reminded that hints of method may be obtained outside educational works. The writer has gleaned many ideas from a comparison of the chaos of Cavendish with the lucidity of Foster's Whist Manual. On their respective values as whist authorities he will pronounce no opinion.

LANGUAGE COURSES IN AUGUST.

By J. W. LONGSDON, M.A.
Surrey County Council Schools.

A VERY useful compilation is issued from the Branch of the Board of Education over which Mr. Sadler presides.¹ This gives a brief notice of seventeen holiday-courses on the Continent organised for instruction in modern languages. In Germany there are four; and it is Germany that will be chosen by the student who is especially interested in pedagogy in general and in methods of modern-language teaching in particular. Professor Rein is well known to Englishmen teaching foreign languages, and many intending students will decide upon Jena on his account. Professor Viotor is no less widely known in England than Professor Rein. To him, as much as to any other individual teacher, is due the introduction of the "direct method" in language teaching. His name will attract the student to the beautiful university town of Marburg, where courses for foreigners in both French and German are held.

¹ Table of Holiday Courses on the Continent, to be obtained on application to the Board of Education Library, St. Stephen's House, Cannon Row, Whitehall, S.W.

The Marburg course has perhaps an additional advantage in possessing an English correspondent who is willing to give information to intending students.² Greifswald offers similar advantages to Jena, and at Kiel conversation classes for foreigners will be held if required. It must not be forgotten that these courses are very largely attended by Germans as well as by foreigners, and have somewhat the character of a university-extension summer meeting in England. This ensures to the Englishman who has already a fair knowledge of German opportunity of making acquaintance with natives of Germany.

Switzerland has three holiday courses specially arranged for foreigners who wish to study French. Geneva and Lausanne both make special arrangements for "methods of teaching," and Neuchâtel advertises a special elementary course. The attraction in Switzerland is, of course, the scenery. Except for this the student may save railway fare by attending a French course nearer home.

In Spain there are to be two courses. One at Avila, organised in connection with the Technical Instruction Committee of Staffordshire. Avila is an inland town. It is claimed that the people speak pure Castilian. The other at Santander, a seaside resort. This course is under the direction of the Teachers' Guild, and an English representative will be present.

France offers a choice of no less than seven centres. Judging from the higher fees, the Paris course organised by the *Alliance Française* is the more serious for advanced students. Students who are desirous of obtaining a *certificat d'études françaises de l'université de Paris* will, perhaps, choose Paris even in the month of August. For this aim a preparatory course is held also in Paris during the Christmas and Easter holidays. This course is worked in connection with the *Alliance Française*, and information can be obtained from the English representative.² The Grenoble course lasts for four months, and is, therefore, beyond the power of the actual teacher. Nancy has a course running continuously throughout the year, which can be joined at any time. A somewhat similar arrangement is made at Caen, where, however, special courses are held in August. Here intending examinees for the London University will get special help. A course is also advertised at Villers-sur-mer, near Trouville. The Teachers' Guild announces two courses this year—one at Tours, and one at Honfleur. Tours will specially appeal to the historical student. The country is rich in monuments. Students who have not been abroad before will, perhaps, be attracted by Honfleur. It can be reached without a railway journey, and special arrangements are made for those who have not much knowledge of the spoken language, in addition to more advanced courses. The courses organised by the Teachers' Guild are differentiated from others in that the students are accompanied by an English representative of the Guild, who is, in conjunction with the local com-

mittee, responsible for the organisation of the courses and the well-being of the students.

In all these courses suitable arrangements are made for ladies. Students who have been abroad before have learnt by experience what to do and need no advice; but a few hints may not be out of place to those who are making a first essay in the coming summer. It is wise to decide early and to write to the secretary of the course for full particulars as regards lectures and lodgings. When the list of recommended lodgings has been obtained it is necessary to write direct to the address given stating clearly what is desired and the dates of the proposed visit. The price to be paid must be had in writing, with a further statement as to extras. Attention to this may save the novice much annoyance. In choosing lodgings the important thing is to find a family where reasonable opportunities of society and conversation may be had. Questions on these points should be frankly asked in the letter of inquiry. A student should refuse to live in a house where the number of English visitors is likely to exceed the number of members of the family. A good plan is to go to an hotel for the first night or two; but the student who does this runs the risk of finding the best lodgings already taken.

When the syllabus of lectures has been obtained the student must make his selection and then read books bearing on the subject. This is most important, because each subject has, more or less, its particular vocabulary, a knowledge of which will lessen the strain of following the lecturer. If the student has little or no familiarity with the spoken language, he must cultivate his fluency and the quickness of his ear as far as possible before he goes. He should read aloud, say half-an-hour a day for a couple of months, choosing a conversational book, and should read and re-read until he can pronounce unhesitatingly and quickly. For the sake of his ear he must get a friend to read aloud to him, also for half-an-hour a day, part of which time he must spend in writing from dictation. Even if the friend's pronunciation is bad, this training is better than none. Students who have been disappointed at the slight result of a month in France would have profited greatly had they adopted the preliminary preparation here suggested. The Englishman suffers from his anxiety to be grammatically correct. He wants to grasp the syntax of each phrase he utters or hears, just as if he were writing French prose. What is wanted by the beginner is the power to catch the tenour of a conversational phrase from the few accented syllables that fall clearly on his ear. And to this matter of accent he should pay particular attention. For instance, he may know well the phrase *allez-vous bien?* and perhaps says it himself, laying stress on the first, third, and fourth syllables. But when he hears *lez . . . en?* with an inarticulate roll between, he may be non-plussed at first.

One or two trifling points may be mentioned as tending to prevent dismay on the part of the untraveller islander. The inevitable soap must,

² Mr. W. G. Lipscomb, County High School, Isleworth.

of course, be taken, and the student who cannot do without his or her cup of afternoon tea should make provision for a private brew. This luxury is rare in French families, and is still more rarely included in *pension* prices. A spirit-lamp and half a pound of tea are all that are needed. Cheap crockery can be purchased on the spot, and milk is always to be got. In Germany, afternoon coffee is sometimes given. The visitor must early prepare his mind to accept a light breakfast of coffee and rolls, with perhaps a little butter added in condescension to the fads of foreigners. For his first principal meal he will have to wait possibly till 12.30 or one o'clock in order to allow a full morning of lectures. The excellence of the meal will compensate for the scanty breakfast, and, if he be wise, the student will soon become accustomed to eat twice a day instead of four times. In a French or German *bourgeois* family far more attention is given to the preparation of the two principal meals than in a corresponding English family. At the same time a certain unaccustomed richness in the cooking, especially in Germany, must be reckoned with and corrected, if necessary, by the use of drugs. On the other hand, the continental idea of comfort and service is very different from ours. The want of adaptability is a serious drawback to English people. There have been students who have turned and fled at once, or whose holiday has been spoilt, because there were no carpets in the bed-rooms and no flowers on the dinner-table, or for some equally trivial reasons. This article is especially addressed to those who have never before been out of England, and the object is to prevent a sudden disillusionment that may mar the happiness of themselves and of their hosts.

The use made of the course and the advantages derived will vary considerably with each student. There are those who would deny the visitor the occasional solace of a chat with a compatriot or an hour with an English novel, and who urge that English must be entirely taboo during the whole of the course in order that the student may be entirely immersed in the foreign language. For teachers after a term's work this is a hard doctrine. The strain of speaking in and listening to an unfamiliar tongue is no slight one, and holidays are intended for refreshment as well as for work. But the snare of always talking to one's fellow countryman must at all cost be avoided if proper use is to be made of the visit. At meal times especially an effort must be made to follow and share in the conversation, and the wise student will encourage his host's propensity to chat over the after-dinner coffee, and will not miss the opportunity of gossip with his hostess in Germany which the afternoon coffee affords. Excursions for the afternoon are usually provided by the organisers of the course. Advantage should be taken of these. The object of the student is not alone to learn the language, but to get some idea of the ways of thought and the habits of life of the nation whose language he is teaching. Every opportunity should be taken of being with the people of the

country, either in the house, theatre, café, beer garden, concert hall, or whatever other place of general resort may be found. It is, perhaps, not well to spend much time in reading or writing. These exercises can be done at home. Especially in the case of a first visit should the student find out all he can of the life of the nation.

One caution is not entirely out of place to some teachers who visit France or Germany for the first time. The French or German town puts on to some extent a festal array to welcome its visitors. There is a feeling of hospitality in the air which is not limited by the money payments of the guests. The families who take boarders expect the consideration usually given by guests to their hosts, while they are keenly desirous to show proper consideration to their guests. In many cases their idea of the English as a nation will be formed from the one or two individuals whom they will thus have an opportunity of studying.

Throughout this article the word "student" has been used as a convenient appellation to include the visitors of both sexes to these holiday courses. But it is well to point out to the novice that the students include men and women (generally in about equal proportion) of education and recognised status in the teaching profession. It is not a case of going to school again; but the holiday course gives an opportunity, fuller than can be obtained by an individual traveller, of gaining just that knowledge of the life of the country which is necessary to make modern-language teaching real and effective.

EDUCATION IN GERMANY.

By C. E. WRIGHT, M.A.

Hanover, Germany.

PRIDE of place in the recent volume on Education in Germany¹ is rightly occupied by Mr. Sadler's article on "Unrest in Secondary Education in Germany and Elsewhere," which is quite as comprehensive as its title indicates. The latter is, indeed, scarcely applicable, for the value of the paper lies chiefly in its references to England, and it was certainly named so as to justify its inclusion in the volume.

The trend of Mr. Sadler's views is best conveyed by one of the pithy quotations which he loves to introduce: "In English education there is a very weak point—and that is the instruction." This is precisely the respect in which the public schools are defective, and their intellectual supremacy may pass away only too quickly, unless a sweeping reform brings them into line with modern requirements. English deficiencies are strikingly summarised. We want better secondary education for boys who commence business at sixteen, better teaching of living languages, ampler provision for organised research, and more of the highest professional and technical training. Many other suggestions ought to meet with instant approval.

¹ Board of Education: "Special Reports on Educational Subjects," Vol. IX.

The abolition of entrance scholarships at school and university, as only crippling the originality of the schools, and the reduction of the number of examinations for government posts, which favour one type of education at the expense of another, are strongly advocated.

The desirability of reducing numbers to percentages for purposes of comparison is overlooked. Had this method been adopted, the leave at II B of the Gymnasia, which is so important in connection with the recently abolished Abschlussprüfung, and is shown to have increased in absolute magnitude, would have been seen to have actually diminished relatively to the total number of pupils. The high standard of this article is not maintained in the chapter on France and America. Sincere admiration of the candid self-criticism of American educationists and of their deep conviction of the possibilities of school work cannot blind us into tracing the demand for a school training better adapted to commercial and industrial ends to American influence on Europe. That would be to confuse cause and effect. The fact is that the same cause, the pressure of competition in trade, has acted in America sooner than in Europe, and to it, here as there, the practical tendency in education is due.

Much matter in this paper, and especially the time-tables and the Decree printed in the appendix, might well have been included in the following note on the New Prussian Curricula. It is a remarkable oversight that in neither contribution is there anything more than a casual reference in a translated passage to the reduction of Greek to the rank of an optional subject. Such a step is too momentous to be ignored. There is, it is true, some uncertainty whether the Gymnasia will, without strong pressure from parents, voluntarily establish the English course prescribed as an alternative for Greek; but, as the Emperor has decreed that it shall be introduced into *all* schools, resistance cannot long postpone the change. And yet, in spite of the frequent mention of it in the Curricula, not a word is said of this change, which amounted, theoretically at least, to the abolition last Easter of compulsory Greek in Prussia.

In a series of special reports the concrete and practical element should predominate over the purely conjectural, but in this volume the proportion of tangible and valuable matter to total bulk varies overmuch from article to article. In none is this proportion higher than in Mr. Field's account of the Elementary Schools of Prussia and Saxony, which is a mine of interesting information. But it is also extremely suggestive. Emphatic support is given to the view that natives who have studied abroad are the best teachers of foreign languages. The superiority of German instruction in this respect is almost as much due to the exclusion of foreigners from the teaching profession as to improved methods. Our weak points are indicated in an excellent contrast drawn between England and the two continental states. They possess an effective system of compulsion

and practically employ only fully qualified adult teachers. German teachers, unlike English, conscientiously prepare the reading lesson; they are trained to facility of expression and consequently excel in exposition. It is satisfactory to learn that our rural schools have a decided advantage as regards buildings and apparatus.

The paper contributed by Mr. Parez on the Measurement of Mental Fatigue establishes a high degree of consistency between the results obtained by various experimenters in this field, and will do much to dispel doubts about the trustworthiness of the methods employed. The results selected from Kemsies' work are more clearly arranged than in the original, and it is only to be regretted that his illustration of the Ergograph was not reproduced along with the sketch given of the Aesthesiometer. It is worthy of note that Kemsies and Friedrich both found the mental capacity for work distinctly less in the afternoon than in the morning, and that the latter obtained the best results when each hour's work was followed by a pause of a quarter of an hour. The first-named has also succeeded in arranging the different subjects of instruction in the order of their relative fatiguing power. He places gymnastics and drill first, as entailing the severest strain on the mind, then mathematics, foreign languages, religion, German, natural science and geography, history, drawing and singing. All observers, be it noted, are unanimous in denying the influence of gymnastics as a mental restorative. An admirable bibliography is appended.

Three other articles equal in interest those already mentioned and with them make up what is of greatest value or novelty in the volume. Mr. Rooper's account of German School Gardens deserves high praise. It contains some excellent programmes of instruction in gardening and fruit-growing for elementary schools. Miss Lyster is too modest about the merits of a very good article on Higher Schools for Girls in Germany. Her promise of further information will be welcomed. Mr. Sadler's discussion of Higher Commercial Education is free from the inequality which might be urged against his introductory paper. He concludes with a delightfully clear exposition of the factors which promote or check the development of higher commercial education. The difficulty which the Technical Hochschulen have recently experienced in obtaining the ear-marked degree of Doctor of Engineering shows how baseless is his hope that the Handels-Hochschulen may ultimately be allowed to confer a doctorate in commercial science.

Inaccuracies occur which may be charitably referred to carelessness of statement. For instance, when we read of the Hochschulen, that "there is a department for shipbuilding at Berlin only; Darmstadt alone has a department for electro-technics," we should be perfectly correct in inferring that naval engineering was taught only in Berlin and utterly wrong in concluding that a complete course of electrotechnics was not given in most Hochschulen.

Finally, "Impressions of Schools in Rhineland" will not be read without amusement. We are told of some villagers who actually obtained a new school because their children had to walk half a mile to the old one at the other end of the village. One child had never seen a sparrow; and a teacher, confined to too few pages of the reader, was detected ingeniously practising her class in reading backwards.

THE OXFORD HOMER.¹

THE textual criticism of Homer is a subject difficult in itself because of the number of special problems it presents, and rendered more so by the great mass of manuscripts. To this mass the papyrus finds of late years have added a great many more, which, although they do not offer variants of great value, yet cannot be left out of consideration. To sift the available MS. evidence it would have been difficult to find an editor better equipped than Mr. Allen, who has made MSS. his special study; whilst Mr. Monro is unrivalled as a guide in matters of language. We are, therefore, not surprised to find that the Oxford Homer is one of the best of the series to which it belongs.

One of the problems which confronts the editor of Homer at the outset is, what text shall he attempt to restore? Shall he work back to the "Iliad" and "Odyssey" as their poets composed them, reproduce a series of (assumed) original ballads, or an epic composed in stanzas of equal length? Or shall he adhere to the traditional form of the epics, but attempt to reproduce the original dialect? Or shall he keep the traditional dialect, but restore the digamma where it must originally have stood, and a few other forms on some certain evidence? It is generally agreed that the two former alternatives are practically impossible. The third has been carried out with some success by Mr. Platt, and we are inclined to think that this restoration at least is a great gain. But recent editors have been more cautious. Leaf and Monro in their annotated editions have set before them the easier task of reproducing the text as it was in the fifth century, B.C.; and the present editors have done the same. From the point of view of the Oxford "Bibliotheca" this was probably the right course to pursue; the main principle of the series being to adhere as closely to the best MS. tradition as possible. We could have wished that they had followed Leaf so far as to print the iota adscript, not subscript, since they are here on the same ground of contemporary evidence in the inscriptions. On this evidence they do print *θησικω, θρψικω, τελσω, οικτιρω*. But if they have erred, they err on the side of caution, and that is a thing to be grateful for.

Mr. Monro's introduction is an able piece of work. It sets forth the history of the Homeric

text with great clearness, and describes the apparatus of MSS.—no less than three hundred of them—which has been used for this edition. The various ancient editions are disentangled from their confusion; and in this section the opinion of Wolf is followed, that when editions were named from a place (e.g., Chian and Cretan) the reference was to the source of the MS. on which they were based, the MSS. in question having been procured from those places for the Alexandrian library. Great weight is given to the authority of Aristarchus, which is also the tendency of later critics. In some cases the authority of the MSS. has been neglected in the light of sure knowledge. Subjunctives like *ἐθέλωμι* are restored on the strength of Aristarchus' opinion, which was based on first-rate MSS. now lost; other forms, such as *τεθηγώς, στήωσι, ἡατο, ἔκηα, ἰδυία, εἶος, and τείος*, are restored on the evidence of etymology or dialect. On similar grounds the forms of the dual, which have been ousted by the plural in the MSS. and *ἐβήσατο, ἐδύσατο*, are restored; but, unfortunately, we think, not the old forms *τίθης, ἐτίθη, and the like*. Other points in which MS. evidence is not to be followed are the article, with the adverbial *τῶ*. It should be noted, by the way, that the accusative was certainly *τῶνς, τᾶνς* when the poems were written, as Monro himself has shown; and if the editors are not prepared to restore these forms, they are certainly right in following Aristarchus and allowing *νς* in compounds, such as *πανσύνδην*.

The editors in their preface point out that a readable text of Homer may be made from almost any MS.; so that if we say no more of this text than that it is readable, we shall be giving poor praise. We can, however, go much further. It is a good text, and, given the conservative principles of the series, as good a text (we believe) as can be constructed. Readers will be quite safe with our text, both critically and grammatically. That is not saying that it could not be improved; but what seem to us possible improvements are, as we have indicated, not universally admitted to be such. As regards single variants, differences of opinion are bound to arise; and, after examining typical passages, we do not find anything serious to regret. The *apparatus criticus* is judiciously compiled. It is alone, so far as our knowledge goes, in a full use of the papyri; and although it does not contain quite so many variants from these as Leaf's new edition, the variants are more typical, on some passages they are more numerous, and what is omitted is often quite unnecessary (e.g., ii. 810). On the other hand, now and then an ancient citation is omitted; we think that these ought always to be recorded in a critical edition.

The Anabasis of Xenophon. Book I. With Introduction, Notes, and Vocabulary by G. M. Edwards, M.A. xxiv. + 112 pp. (Cambridge Series for Schools and Training Colleges.) 1s. 6d. —Mr. Edwards rightly describes the *Anabasis* as fascinating, although the middle-form boy gets so little at a time that the fascination partly escapes him. The editor's work is generally satisfactory. His fondness for quotations, which we have noted in other editions of his, is here in place when he quotes from books of travel.

¹ "Homeri Opera": recognoverunt brevique adnotatione instruxerunt David B. Monro et Thomas W. Allen. Tomi II. [No paging]. Scripturum Classicorum Bibliotheca Oxoniensis. Paper 2s. 6d. each, cloth 3s.

WALKING TOURS IN THE TYROL.

By E. L. MILNER-BARRY, M.A.

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SOME summers' tramping and climbing in different parts of the Tyrol and a profound belief in this form of holiday for the jaded brainworker have led me to put together a few notes on suggested routes and to jot down a few hints for those who are as yet unacquainted with this delightful part of Europe.

Those of my readers who are familiar with Switzerland, but who as yet have no nearer acquaintance with the Eastern Alps, will probably jump to the conclusion that the conditions of travel in both countries are very similar. Yet this is far from the truth. Switzerland, which year by year is brought closer to England, so that now it is possible to breakfast in Lucerne and sup in London the same evening—Switzerland is at the present time as much an English holiday-resort as St. Andrews, Nairn, or Ilfracombe. Swiss hotel-life is therefore largely regulated by English habits and tastes; even the pedestrian must in some degree conform to fashion and burden himself with a considerable amount of *impedimenta* and changes of raiment, in which to make his appearance at the *table d'hôte* in the hotels, where he must occasionally seek shelter, and he will find that portage of luggage and fashionable hotels with *table d'hôte* will swell to an appreciable extent the cost of his campaign.

Far different is the Tyrol. Somewhat less accessible than Switzerland, it has hitherto escaped wholesale invasion and appropriation at our hands, nor has it as yet been consistently exploited by any tourist agency. The swarms of strangers who penetrate it every year are for the most part German, and the German travels at a reasonable cost or stays at home. The Tyrolese hotels in the larger towns are clean, comfortable, and moderate in price, while even in the more remote parts the German-Austrian Alpine Club has constructed shelter huts—available for the ordinary pedestrian—which are little inns in miniature, and far surpass in comfort and equipment any mountain shelters which Switzerland can produce. Nothing, too, can exceed the friendliness of the Tyrolese themselves. By stern necessity wedded to a life of thrift, they seem to realise fully that it may be possible to attract to their country part of the stream of gold which flows annually from north to south, and to this end they have established a *Landesverband für Fremdenverkehr*, with offices in every important town, where travellers are courteously welcomed and advised as to routes, hotels, means of conveyance, &c.

The traveller may approach the Tyrol by various routes: the two recommended on the ground of economy and general convenience are: (a) The Harwich - Hook and Harwich - Antwerp

route of the Great Eastern Railway, whose fleet of cross-Channel steamers cannot be surpassed for comfort; and (b) the Dover-Ostend route of the Belgian State Railway, with a shorter sea passage. Both these companies¹ issue circular tickets, first, second, or third class, or for different classes on different parts of the route, to Germany, Switzerland, and the Tyrol, and the itinerary may be broken at one place and resumed at another, the traveller finding his own way between the points in question.

The following specimen tours are recommended:—

(a) BY GREAT EASTERN RAILWAY. (1) London—Harwich—Hook of Holland—Cologne—Aschaffenburg—Munich—Partenkirchen [break] Innsbruck—Landeck—Sargans—Zurich—Bâle—Bingen—Cologne—Hook of Holland—Harwich—London.

Fares: second class throughout, £6 15s.; second class in England, third class on the Continent, £4 16s. 6d.; returning from Bâle *via* Brussels—Antwerp—Harwich, second class throughout, £6 5s. 8d.

(2) London—Antwerp—Malines—Brussels—Luxemburg—Strassburg—Bâle—Zurich—Sargans—Feldkirch—Landeck, and back by the same route.

Fares: second class throughout, £6; second class in England, third class on the Continent, £4 3s. 8d.

(b) BY THE BELGIAN STATE RAILWAY. (1) Dover—Ostend—Brussels—Cologne—Mainz—Würzburg—Munich—Partenkirchen [break] Innsbruck—Landeck—Zurich—Bâle—Strassburg—Luxemburg—Brussels—Ostend—Dover.

Fares: second class throughout, £5 17s. 4d.; third class throughout, £3 18s. 1d.; to this must be added third-class return fare from London to Dover, 12s. 11d.

N.B.—On the boat trains there is, as a rule, no third class, and express fares are charged. It is therefore better to book from Dover and avoid the boat trains.

(2) Dover—Ostend—Brussels—Luxemburg—Metz—Strassburg—Bâle—Zurich—Sargans—Landeck, and back by the same route.

Fares: second class throughout, £5 12s. 5d.; third class throughout, £3 13s. 9d.; third-class return fare London to Dover, 12s. 11d.

These circular tickets are available for forty-five or sixty days, according to distance. No free luggage is allowed on the Continent, but a Gladstone or kit bag may be stowed in the carriage without let or hindrance. The tickets are available by rail or boat between Cologne and Mainz. At least three days' notice must be given to the companies who supply the tickets.

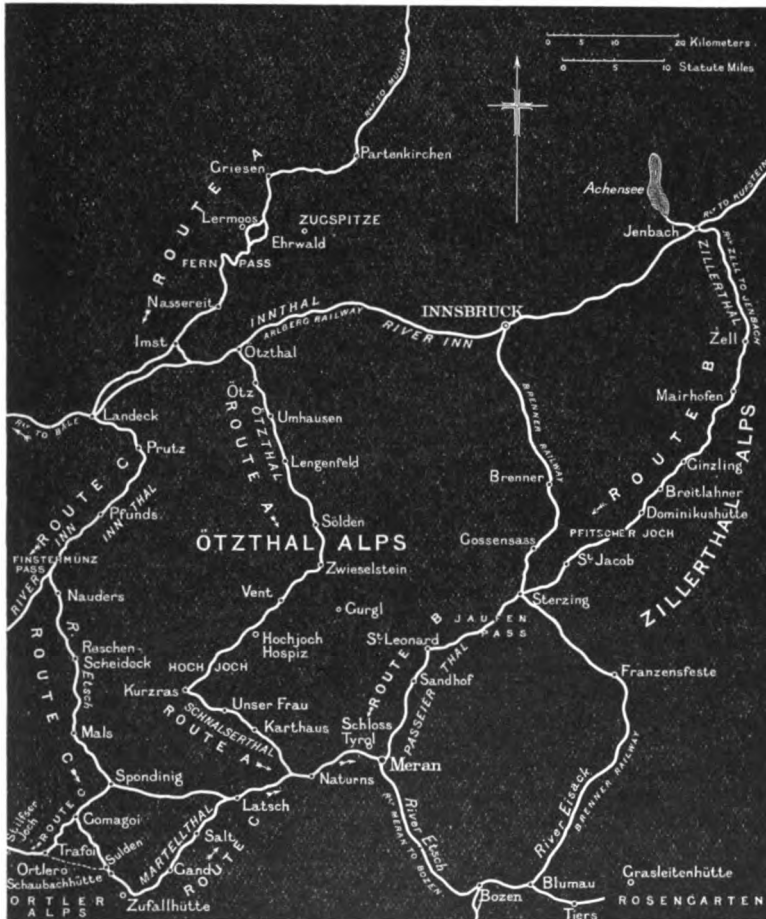
Facilities for third-class travelling on the Continent are in their infancy. The third-class carriages are bad, and as a rule do not run on the fast trains. The Belgian State Railway has, however, established a through third-class express service from Ostend to Bâle, and Bâle to Ostend, but it is a night train. Second-class passengers may travel first saloon on the Great Eastern Railway boats on payment of 11s. on return tickets; on the Ostend boats on payment of 3s.

¹ Address Great Eastern Railway, Liverpool Street Station, E.C. Belgian State Railway, 53, Gracechurch Street, E.C.

The Great Eastern Railway boats have a number of two-berth and three-berth cabins which may be reserved by passengers without extra charge.

If the traveller has leisure to spend some days over the journey, I would suggest the following route:—Cologne, where a halt of a few hours will suffice for the inspection of the cathedral; thence by train to Bonn, where the night may be spent (Hotel Klei); the Rhine steamer should then be used as far as Mainz (Hotel Rheinischer Hof), where the Museum and Cathedral may be visited. Frankfurt (Hotel Deutscher Kaiser) is very quickly

Bavarians, seen at its best perhaps in the so-called *Kellern* outside the town. But Munich is no place for a summer holiday; the heat is sweltering, and we shall do well to follow the example of the Munich people and betake ourselves to the cooler atmosphere of the Bavarian Highlands. A run of a few hours will take us to Partenkirchen (Hotel Stern), one of the termini of the railways running up into the hills. *En route* a break may be made at Oberau, whence the historic village of Oberammergau may easily be reached. At Partenkirchen we bid farewell to civilisation, and sending on heavy luggage to Meran (see "Hints") we wander from the Bavarian Highlands across the boundary into the Tyrol.



Map of the Tyrol, to illustrate Tours A, B, and C.

reached from Mainz, and here some little time may be spent in one of the busiest of German cities; so thoroughly modern in its commercial aspect, and yet so venerable with its Römer, Jews' Quarter and Goethehaus. Leaving Frankfurt soon after midday, Munich (Hotel Rother Hahn) will be reached in the evening. There is much to hold the traveller spellbound in Munich, the city itself, with its wide streets, spacious squares and noble buildings; its unrivalled collections of paintings and sculpture housed in the Alte and Neue Pinakothek and Glyptothek, its theatre and its opera house, and the easy-going life of the

ROUTE A (see Sketch map).

First Day.—Partenkirchen, through the valley of the Loisach and the Ehrwald pass past Griesen (Austrian frontier) to Lermoos (Hotel Drei Mohren).

Second Day.—From Lermoos, which lies in a broad valley, shut in by the precipitous walls of the Wetterstein Mountains, the road leads through the Fern pass, which ranks with Finstermünz as one of the finest passes below the snow line. Round it cluster numerous lakes, and the picturesque castle of Fernstein towers over it. Nassereit (Hotel Post) is the next place of importance, and some seven miles further on is Imst (Hotel Lamm) where a halt may be made for the night.

Third Day.—We are now in the Valley of the Inn, which roused the enthusiasm of Addison,¹ who passed through it on his way from Switzerland to Vienna. But the Innthal is not one of the most picturesque of the Tyrolean valleys; from Imst to Innsbruck it is a great wide sweep, and we shall do better from the point of scenery to choose one of the lateral valleys which debouch into it. Crossing the river and the Arlberg Railway, we enter the Ötztal at the station of the same name, and gradually ascend the valley to Ötz (Gasthaus zum Kassel).

Fourth Day.—Leaving Ötz the road ascends past Umhausen to Lengenfeld (Hotel Stern) where a mid-day halt may be made; two hours' walk will bring us to the large mountain village of Sölden (Hotel Grüner zum Alpenverein).

Fifth Day.—At Sölden the road ends, and a bridle path by a mountain torrent—die Ache—brings us in a short time to Zwieselstein, where the Ötztal divides into the Gurglthal and the Venterthal. Bearing away to the right past Heiligkreuz, Vent (Gasthaus Tappener) is reached some three hours after leaving Zwieselstein, and here the traveller will do well to provide himself with a guide for the next stage of the journey over the Hochjoch Glacier to Kurzras (tariff for guide 11 kronen). If an early start has been made from Sölden and

¹ Addison was certainly ahead of his age in his appreciation of natural scenery. His observations on "Tyrol, Innsbruck, Hall," are well worth reading.

the weather is good, the Hochjoch Hospiz may be reached the same evening and the night spent in ease and comfort there.

Sixth Day.—Leaving the Hospiz the way lies across the glacier; the route is easy and perfectly safe with a guide. The highest point reached is about 2,285 metres. Soon afterwards the glacier is left, and there is abrupt descent to the little village of Kurzas, some four hours from the Hospiz. Here the Schnalserthal is entered and a bridle path leads down to Unser Frau (Inn zum Adler).

Seventh Day.—The path leads past the romantically situated hamlet Karthaus, where the old monastery has been converted into a picturesque inn, die Rose. Soon afterwards we come to Neuratteis, where the road begins, and runs through a wild ravine down to join the old post-road through the Vintschgau close to Naturns (Hotel Post). A halt may be made here and the walk resumed to Meran (Hotel Graf von Meran), which is reached in three hours' easy walking.

Eighth Day.—The walking tour probably ends here, where the traveller should find his baggage waiting for him, but he will do well to spend some little time in the old capital of the Tyrol, to wander up into the hills overlooking the town as far as Schloss Tirol, or follow the Passerbrook into the Passeierthal.

Meran is connected by railway with Bozen on the Brenner line, and the shortest route home will be this way. By careful arrangement a good deal of the country may be seen without unduly prolonging the tour.

Ninth Day.—Rail to Bozen (Hotels Stiegl or Greif):—Sights: Cathedral, Schloss Runkelstein, Museum (fine collection of Tyrolese costumes), Lauben, statue of Walter von der Vogelweide.

Tenth Day.—Rail by afternoon train to Blumau, where heavy luggage should be left, walk through the Tierserthal to Tiers (Inn Rose).

Eleventh Day.—Through the Tschaminthal to the Grasleitenhütte, a beautiful walk, somewhat rough but involving no climbing. The Grasleitenhütte is built in the famous Rosengarten group of the Dolomites, whose jagged peaks look all aflame when seen from Bozen in the evening sunlight. The fantastic appearance of these rocks and the magnificent views to be obtained will amply repay the labour of this little *détour*. The night will be spent in the Grasleitenhütte.

Twelfth Day.—Walk up to the head of the Grasleiten pass, back to the hut and descend to Tiers. Pick up luggage at Blumau, and, if time suffices, take train to Gossensass (Hotel Wielanderhof). Should Blumau be reached late in the afternoon it will be best to pass the night here and proceed early next morning to Gossensass.

Thirteenth Day.—Walk over the Brenner pass and rejoin the train at Gries, reaching Innsbruck (Hotel Habsburger Hof) in the evening.

Fourteenth Day.—Sights of Innsbruck: Hofkirche with the magnificent statues round the tomb of Maximilian, Ferdinandum (paintings by Defregger of Hofer and other patriots), Berg Isel with the Hofer memorial, Goldnes Dachl, and, should time admit, Schloss Ambras.

The journey home may be made by the Arlberg. Zurich, Bale, Strassburg, Brussels, are suggested as halting-places to those who have still time at their disposal.

ROUTE B.

Starting point, Jenbach on the Munich-Innsbruck line. Jenbach may be reached either by Munich, or by the Arlberg to Innsbruck and on to Jenbach.

First Day.—Jenbach to the Achensee, to which circular tickets can be made available; a cog-wheel rail leads up to the lake, one of the most famous in the Tyrol, where at the

station, Achensee, the boat may be taken for the tour of the lake.

Second Day.—Send heavy luggage to Sterzing or Meran, and, avoiding the little railway from Jenbach, wander through the Zillerthal to Zell (Hotel Post) some fifteen miles. A walk of about two hours from here brings us to Mairhofen (Hotel Neuhaus), a picturesque village quite shut in by hills which seem to forbid further progress.

Third Day.—At Mairhofen the Zillerthal splits up into four valleys, *Grunde* or *Äste*, as they are locally named; through any of these, delightful excursions can be made. We follow the path through the Zemmthal, almost a direct continuation of the Zillerthal running S.S.W. by the Zemmbach. Gradually ascending we come to the Dornabergklamm, a ravine in the rocks, and see below the brook running along. Ginzling (Kroll's Wirtshaus) is reached some three or four hours from Mairhofen. At Breitlahner, the next stage, the valley divides, the Zemmthal leading to a pass over the mountains to the Ahrnthal; the Zamsenthal, which we now enter, taking us towards Sterzing, over the Pfitscherjoch. The path mounts sharply up at the back of the new inn at Breitlahner, and reaches in about two hours' the Dominikushütte, where the night is spent.

Fourth Day.—Leaving the Dominikushütte with its magnificent view of the glaciers of the Schegeisenthal, we reach the Pfitscherjoch, or pass, in about two-hours-and-a-half. There is a small inn on the top, where a short rest is advisable. A steep, though well-marked descent brings us to St. Jacob (Rainer's Wirtshaus), where a good meal may be obtained. A stiffish walk of from three to four hours brings us to Sterzing (Hotel Goldene Rose), the Brenner line being crossed before the town is reached.

Fifth Day.—A day's halt may well be made in Sterzing, one of the quaintest towns in the Tyrol, and the site of a Roman settlement. The Pfarrkirche, Rathaus and Lauben should be visited.

Sixth Day.—Follow the main road to the hamlet Gasteig where the old bridle path into the Jaufenthal begins. After some two to three hours' walking a little chapel is seen perched upon the horizon; behind it lies the Jaufenspitze, and to the right the Jaufen pass. An unpretentious little inn is close at hand, the only comfortable baiting place till we reach St. Leonard. The head of the pass is soon reached from here, and we look down on the Passeierthal, which has played so large a part in the history of the country. The descent is roughish; passing the hamlet of Walten, St. Leonard (Hotel Strobl) is reached some three hours from the pass head.

Seventh Day.—A short walk down the valley brings us to the Sandhof, the birthplace of Andreas Hofer. Many memories of Hofer cling to the place, and some of the old rooms of the Sandhof may still be seen. Close by lies the pretty Hoferkapelle (key at the Sandhof), with good modern paintings of the Tyrolese War of Liberation. The stream is followed down the valley to Meran (Hotel Graf von Meran), which is reached in a few hours.

Eighth Day.—See "Route A," *Eighth Day*.

The journey home may be made exactly as in Route A, or the route described in "A" from Ötztal to Meran may be reversed and the Arlberg railway joined at Ötztal. Another way is to follow the Vintschgau road to Spondinig, and from there the Finstermünz road to Landeck (Hotel Post). Cf. "Route C," *Landeck to Spondinig*. There is also a good service of omnibuses and coaches from Meran to Landeck. Particulars can be obtained at the hotel in Meran.

ROUTE C.

Out to Landeck (Hotel Post) by Bâle, Zurich and the Arlberg, spending a day at Feldkirch (Hotel Bär), which is reached soon after entering the Tyrol at Buchs. Should time permit on the journey from Feldkirch to Landeck, the railway may be left at Langen and rejoined at St. Anton.

First Day.—(Heavy luggage to be sent on by post to Trafoi.) At Landeck the valley of the Inn is reached, and the Finstermünz road follows it almost due south. The road is excellent, and forms one of the oldest links between South Germany, Austria and Italy over the Stelvio pass. The villages of Prutz and Ried (Inn Post) are soon left behind, and after passing Pfunds the route ascends sharply to Finstermünz. The construction of the road is remarkable, and not unlike that of the Axenstrasse near Lucerne, but it is on a grander scale. Galleries through which the road runs are hewn into the solid rock; some hundreds of feet below the river Inn rushes past, and by it we see traces of the old road. In the hollow the tower of Altfinstermünz forms a striking picture; at the top of the pass, some twenty-seven miles from Landeck, is Neufinstermünz, where a comfortable hotel will receive the traveller, if he does not feel inclined to push on to Nauders.

Second Day.—Leaving Finstermünz, the river Inn and the Inn valley disappear on the right, and soon Nauders is reached, whence a post road runs into the Engadine. In Nauders, from the churchyard, the first view of the Ortler group is obtained. From Nauders the ascent is gradual to the Reschen lakes; here we are on the watershed of the Inn and the Adige or Etsch, the Black Sea and the Adriatic. Passing the village of Reschenscheideck, to which the watershed has given its name, we come, after about three hours' walk, to the old walled town of Mals (Inn Bär).

Third Day.—From Mals a road runs past Taufers to Santa Maria in the Engadine, whence the top of the Stelvio pass may be reached over the Wormserjoch, but the old road is the more interesting, and leaving the Münsterthal on the right, we pass Schluderns and reach Sponding, where the road bifurcates, the Stelvio or Stilfserstrasse running due south, the Vintschgau road running east to Meran. Crossing the Etsch and going through the village of Prad, we come to Gomagoi, where a midday halt may be made (Reinstadler's Gasthaus). At Gomagoi a road branches off to Sulden. Leaving Gomagoi, the road ascends sharply by the Trafoier Bach, and Trafoi (Hotel Neue Post) is soon seen standing out against a background of solid ice and rock. Few spots indeed can rival this village in the beauty of its situation.

Fourth Day.—An excursion should be made to the top of the Stelvio pass. The road—the highest in Europe—winds and curves in countless serpentines past the Weisser Knot, Franzenshöhe, till the summit is reached at Ferdinandshöhe, the altitude being 9,055 feet. The hotel at the top offers good accommodation. If the weather is clear the Dreisprachenspitze should be scrambled up; the summit is reached in about a quarter of an hour. There is a magnificent view of the Ortler and of the Ötztal Alps, while immediately in the foreground we have the wonderful construction of the Stelvio road itself. A short scramble down the other side of the pass brings us to the Italian frontier, whence we retrace our steps by the same route to Trafoi.

Fifth Day.—(Post luggage to Meran.) Sulden is the next point to be reached. There are two routes. (1) Follow the road down to Gomagoi and ascend by road to Sulden; or (2) ascend by a mountain path to the Tabarettajoch as if to climb the Ortler, make a halt at the Payerhütte, where food can be obtained, and descend direct to Sulden. This second route is, however, hardly legitimate walking, and a guide should be taken by the inexperienced.

Sixth Day.—In Sulden (Hotels Ortler or Eller) a guide must be engaged to conduct the party over the Madritschjoch into the Martellthal. (Tariff, guide from Sulden to Salt, 15 kronen.)

Seventh Day.—Leave Sulden in the afternoon for the Schaubuchhütte. The hut is often crowded, as it is the base for many of the climbs in the Sulden district, but a message sent up from the hotel in the morning would ensure accommodation.

Eighth Day.—Starting early, the top of the Madritschjoch is reached in about three hours. A midday pause may be made at the Zufallhütte, then the Martellthal is entered, and passing the village of Gand, we reach Salt, where quarters are obtainable at the *Bad*.

Ninth Day.—The Martellthal opens out on to the Vintschgau road some two hours below Salt at Latsch, and passing Naturns, we come to Meran, whence the journey may be continued as in "Route A."

GENERAL HINTS.—Guides "Baedeker," "Meyer," or "Trautwein." All three are excellent. Trautwein's maps are especially good.

LANGUAGE.—Colloquial knowledge of German indispensable.

MONEY.—Austria now reckons by kronen. One krone = 10 pence. 100 heller = one krone. The older coinage, just double in value, is still in use. One gulden or florin = 1s. 8d. 100 kreuzer = one gulden or florin. Money should only be exchanged in the large towns. Austrian bank-notes of 10 kronen are convenient.

EXPENSES.—Apart from any expenses for railway fares, luggage, &c., ten to twelve kronen a day is a liberal provision.

LETTERS should be addressed to any larger place which the traveller will touch, and should bear the word *Postlagernd* in a conspicuous position. They are handed out at certain hours of the day to callers. A passport will be found a convenience. No registered letter will be handed over unless a passport is produced.

FOOD.—In the more mountainous districts there is naturally little variety, but good veal can usually be obtained. Soup (*bouillon mit ei* being the best variety) is obtainable everywhere, and is a first-rate diet when walking. Beer, except in the towns, should as a rule be avoided. Of the wines which the Tyrol produces, the red wine may be recommended in small quantities. The coffee is good, tea undrinkable. Pedestrians will do well to find a corner in their rucksacks for some slabs of chocolate and a small flask of brandy.

LUGGAGE.—A medium-sized Gladstone, or kit-bag, and a rucksack. The latter may be obtained anywhere in the Tyrol or Bavaria at the price of a few shillings, and is a great improvement on any kind of knapsack. The bag will be sent on from place to place through the post and addressed *Postlagernd*, or to the hotel where the pedestrian intends to stay. The charge for conveyance of luggage in this way is extremely moderate. A *begleitschein*, obtainable for a few kreuzer at any post office, must be filled in by the sender. In passing from Germany into the Tyrol, or *vice-versa*, care should be taken to address the luggage only

to the frontier, where the owner can see it through the customs and rebook it; otherwise difficulties may ensue. When in doubt information may be obtained at the post office.

CLOTHES.—*All wool as far as possible.* A medium-weight Norfolk suit (including waistcoat), lined *jäger* or flannel, with plenty of pockets with flaps to button over, thick stockings, heavy-nailed golf or shooting boots, flannel shirts, and soft felt hat. A coat is an impossibility; the best substitute is a deep mackintosh cape, which, in rainy weather, will cover shoulders, back, and rucksack. An alpenstock, procurable anywhere in the country, should replace a walking stick.

NOTE.—The tours described above have been made by ladies who are good walkers and dress suitably. The accommodation in the club huts, though not luxurious, is sufficient. Ladies who contemplate making these tours would do well to consult the chapter on dress for ladies in "Mountaineering," Badminton Library (Longmans).

A HOLIDAY GAZETTEER.

A SELECTION OF FAVOURITE HOLIDAY RESORTS OF TEACHERS.

WHERE to go for rest and change is a problem which presents itself to every teacher at the end of the summer term. But unless the question has received due attention before the actual advent of the holidays, this all-important matter is apt to be decided upon hurriedly, with the result that the annual opportunity for obtaining the necessary recreation and storing the much-needed potential energy for the winter's work is either lost, or largely frittered away, by the selection of a place with an unsuitable climate, or one lacking those resources necessary to tone up ragged nerves and recuperate dissipated energies. To enable our readers to benefit by the actual experience of colleagues who have visited many parts of Europe, we some time ago asked a number of schoolmasters and schoolmistresses working in secondary schools of different grades to place the result of their experience at the disposal of their colleagues, so that they might know of desirable localities discovered by teachers, and be saved the danger of drawing a blank in the lottery of selecting a suitable place from railway and other guides. What we asked was the names of the places which had been found to be most attractive at home and abroad, and a brief statement of the character and accommodation. We are indebted to the following schoolmasters and others for the information given below in answer to our inquiry. Many of our correspondents have generously offered to give fuller information as to the places they have named, but the details supplied will, in most cases, be amply sufficient for the selection of the district to be visited.

Dr. H. H. Almond, M.A., Loretto School;

C. H. Ashdown, St. Albans Grammar School; H. W. Atkinson, M.A., Rossall School; E. L. Milner Barry, M.A., Mill Hill School; C. W. Bourne, M.A., King's College School; Rev. R. Percival Brown, M.A., Warwick School; Miss Sara Burstall, B.A., Manchester High School; Miss Harriet Byles; Fred. Charles, B.A., Strand School; Rev. H. J. Chaytor, M.A., Merchant Taylors' School, Crosby; G. H. Clarke, M.A., Hymer's College, Hull; Miss E. S. Collett, North London Collegiate School for Girls; W. D. Eggar, M.A., Eton College; A. J. Evans, M.A., Christ's College, Cambridge; A. H. Gilkes, M.A., Dulwich College; Charles Godfrey, M.A., Winchester College; A. Gorham, B.A.; Rev. H. B. Gray, D.D., Bradfield College; Prof. R. A. Gregory, Queen's College, London; F. J. R. Hendry, M.A., Bromsgrove School; E. W. Herbert, Edinburgh Academy; Paul Matthews, M.A., Mathematical School, Rochester; Dr. J. D. McClure, M.A., Mill Hill School; A. E. Munby, M.A., Felsted School; A. G. Munro, B.A., City of London School; Dr. Maria Ogilvie-Mordon, Aberdeen; H. S. S. Parker, B.A., Rottingdean School, Brighton; J. L. Paton, M.A., University College School, London; de V. Payen-Payne; S. de Ste. Croix, M.A., St. Edmund's School, Canterbury; Dr. G. S. Turpin, M.A., Nottingham High School; W. H. Weedon, County School, Richmond, Surrey; H. G. Wells; S. E. Winbolt, M.A., Christ's Hospital, Horsham; Rev. W. J. Wood, M.A., Bury Grammar School, Lancs.

The information was asked for under the following headings: (a) Name of place (home or abroad); (b) Its general character; (c) Hotel or *pension* recommended; (d) Other remarks. The places mentioned in the replies are classified geographically below, and the notes are in each case based upon personal experience. Any teachers who would like to add to the list here given are invited to send the names of places and notes before June 10, for publication in our July number.

FAVOURITE PLACES AT HOME.

Cornwall.—Rock, by Padstow or Wadebridge; north Cornish coast, by Padstow Harbour; *Rock Hotel*; St. Enodock golf links.

Perranporth; charming coast; *Perranporth Hotel* (quite an inn) very cheap. Private sitting-room in 1894 cost 10s. 6d. a week.

Porthleven, *via* Helston (G. W. R.); accommodation for visitors limited; fishing village in middle of Mount's Bay. In neighbourhood of Mullion, Kynance, Lizard, Falmouth, Penzance, St. Michael's Mount, Marazion, Land's End. Only rooms in private dwellings available. Mrs. Solomon Rowe, *Peveril Terrace*, receives a few lodgers. A primitive spot. The cycle, country coach, and cliff walks, make a variety.

St. Mary's, Isles of Scilly. Sailings (steam) from and to Penzance four times a week; passage about 4 hours; fare, 10s. 6d. return. Very quiet and clean (no factory smoke), hot, oppressively hot in August and September; a little walking will always bring one within reach of a sea breeze. Main island about 9 miles in circumference, a stiff walk to get round. Splendid boating within the archipelago, whatever the direction of the wind (advantage over an ordinary sea-side resort). Very good sea-fishing among the islands—pollock, mackerel; at the

Powl, about 4 miles to the south-west, cod, conger, skate, can be caught in abundance. Sailing boats, including an experienced sailor, cost about 10s. to 12s. a day. The man has to be fed. Rowing boats are hardly safe except just in the roadstead. Bathing not very good, save for swimmers and ladies (who have the best bathing-beach reserved for their use). Magnificent scenery of rocks and islands. One good hotel, *Tregarthen's*, but private lodgings can easily be got from £1 1s. a week upwards, and there are one or two boarding-houses from 5s. a day upwards, e.g., Colson's, The Bank, Scilly. Fare and accommodation simple and plain, but sufficient.

Devonshire.—Ermington, Ivybridge (South Devon). Delightful Devonshire village, 4 miles from coast and 4 from Dartmoor. Rev. E. Pinwill, the Vicarage, Ermington, receives paying guests (25s. to 30s. a week).

Clovelly (North Devon); unique; *Red Lion Hotel*; and Mrs. Vine, 86, Clovelly; some charming country within easy walking distance, good boating, fishing.

Dorset.—West Bay, Bridport; quiet, uninvaded by holiday makers; golf links; bracing. Pier Terrace, West Bay, Bridport; any houses on terrace are fair; no good hotels.

Hampshire.—Hayling Island. (Southsea and Portsmouth quite close.) Primitive; good bathing, sea fishing, golf. *The Royal Hotel* (special terms for golfers). Golf links, some of the best in England.

Isle of Man.—Peel; fishing village, good, moderately hilly country all over the island; *Creg Malin Hotel*; good pension on front, north end of village.

Port St. Mary; good, cheap, quiet; *Shore Hotel*.

Port Erin; splendid cliffs and sea-bathing, boating, sailing, good walks along coast; Castle Mona (boarding house), and plenty of hotels and boarding houses; very bracing air.

Jersey.—St. Helier's or St. Aubin's; beautiful scenery, plenty of maritime and inland excursions, cheap tobacco. *Pomme d'Or* (French table); *Customs Hotel* (English), about 6s. 6d. a day. Can be made a centre for exploring Channel Isles, Normandy, and Brittany.

Norfolk.—Cromer; inland scenery pretty, roads very fair. Links most excellent, now eighteen holes, on the cliffs over 200 feet high in places. Mrs. Moulton, boot shop, corner of the main street containing the parish church. Most remarkable sections of drift contortions in cliffs.

Shropshire.—Church Stretton; hilly woods, good cycling roads, antiquities, flowers, views. *Buck's Head* or *Church Stretton Hotel*.

Derbyshire.—Little Longstone, near Bakewell; small village near top of Monsal Dale, very quiet; rooms, Mrs. Nuttall, Mrs. Maltby, Miss Shimwell; station, Great Longstone; good walks and rides; Haddon and Chatsworth districts.

Somerset.—Minehead; wooded cliffs, wooded hills in immediate neighbourhood, pretty country beyond for rambles; not specially good for cycling; select and quiet; safe bathing.

Burnham; bracing air; really good golf; near Glastonbury, and a good deal of interesting country; not fashionable; bathing poor; *Queen's Hotel*.

Surrey.—Wotton, 3 miles west of Dorking; quiet country, with lovely scenery (not visible from main road), easily reached by walks in all directions; healthy bracing air; *Wotton Hatch* or (rather more expensive) *Abinger Hatch*, a mile further from Dorking. A fortnight will hardly suffice to see all the beauties of the neighbourhood, partly walking, partly cycling.

Sussex.—Alfriston; nearest station Berwick (L.B. & S.C.R.); quiet old village, with river and open country; splendid walks on downs and to the coast, about four miles away. *Star Inn*; but it is difficult to obtain accommodation, as the place is small and easily filled.

Midhurst, extremely pleasant little Sussex town, amidst heath

and pinewoods; endless pretty walks and good cycling centre; lazy boating on a pretty old canal; a good place for reading or a rest. A few furnished houses may be had and lodgings. *The Angel Hotel*. Mrs. Walton, North Street, for homely lodgings.

Lewes, for splendid walks on downs and in the Weald. *White Hart Hotel*.

Worcestershire.—Beautiful hilly district (up to 1000 feet); 2 miles from railway, Hagley (G.W.R.), near Stourbridge, 3½ to 4 from a large junction—Stourbridge Junction, G.W.R.—at which station all trains stop. *Woodman* and *Fountain*, but lodgings can be had (rather expensive sometimes). Good bicycle excursions, though some stiff hills about. Excellent photographic scenery; fine centre for pedestrians.

Enville, on the other side of Stourbridge, is of much the same description but quieter, being 5 miles from a railway station (Stourbridge Junction, G.W.R.) and 3 from an electric tram (Kinver); not so hilly. Permission has to be obtained to see the grounds of private proprietors, many of which are exceedingly beautiful.

Yorkshire.—N. York Moors, dales, valleys of Swale, Ure, Tees, and Eden, within reach of a good walker; wild moorland; plenty of water; an excellent neighbourhood for those who can walk. Mrs. Hasker, C.B. Office, Arkengarth-Dale, Yorks. (Farm house.) The cost is about 25s. a week—full board.

Castle Howard Estate—seat of the Earl of Carlisle—a magnificent park, with splendid country, Vale of Pickering, &c.; in the park, on high elevation, is Temperance Hotel, homely but good, kept by Mr. Dickinson. Bracing, but not violently so; peaceful, and altogether a charming schoolmaster's holiday resort.

North Wales.—Capel Curig; bracing; *Royal Hotel* and *Cobden's Hotel* (pension arrangements may be made). Good climbing, walks, and fishing.

Rhôs, near Colwyn Bay; sea, hills, bracing air, quiet. *St. Winifred's* (Mrs. Gray). Good walks and drives.

Lwyngwrie, 6 miles south of Barmouth, Merionethshire; quiet Welsh village, centre for walking, cycling, mountain-climbing, &c. Private apartments only—apply Postmaster.

Scotland.—Gulane, Haddingtonshire, N.B.; golfing resort; *Bisset's Hotel* or *Hopefield Private Hotel*. About 4 miles from North Berwick; has two golf courses, and is near New Luffness and Muirfield courses.

Edinburgh; University Hall, S. Giles's House.

Oykell Bridge, Lairg; small hotel, very quiet; two or three lodgings quite good within 4 miles, not much run after; not at all expensive; nice homely people, daily mail-car from Lairg passes the door. The best trout-fishing is at Aultgulgadi; a *table d'hôte* hotel.

Strathyre, Trossachs district; quiet and bracing; mountainous country; fishing; accommodation limited; small houses can be taken.

Speyside, Kingussie and Laggan; magnificent Highland scenery; mountain air.

The Co-operative Holidays Association (in connection with the National Home Reading Union) have three delightful permanent homes: (1) The Abbey House, Whitby, Yorks. (2) Ardenconnel, Row, Scotland. (3) Park Hall, Hayfield, in Stockport. (1) The Abbey is close to the Abbey—an old mansion—Whitby needs no description. (2) Ardenconnel is in lovely grounds and overlooks Gareloch, within easy reach of Glasgow, also of Loch Lomond, &c. (3) Hayfield is close to Kinder Scout and the North Derbyshire scenery. Besides these three, the Association will have other centres in the holiday months: at Ramsey (Isle of Man), Monmouth, Bangor, and Portrush. Anyone may enter, but it is usually necessary to book beforehand. Apply to Mr. T. Leonard, Park Hall, Hayfield, Stockport.

FAVOURITE PLACES ABROAD.

Belgium.—Houyet or Waulsort, near Dinant. Cheap pretty centres for walking excursions, boating, river bathing, fishing and cycling. Quite comfortable *pensions* at 4 and 5 francs a day. Good coffee and homely welcome in every village. *Hotel de la Leise Houyet*, 4 francs. Several hotels and pensions at Waulsort. Study a *Guide Officiel* of the C. de Fer of Belgium before going, and get the government map of the district (3 francs). Houyet, *visâ* Jemelle.

Waulsort (between Hastière and Dinant, on the Meuse). Good centre for the Ardennes, excellent bicycling, boating on the Meuse, not far off French frontier. *Grand Hotel de la Meuse*, about 5 francs per day. Knowledge of French advisable. The various rivers which run into the Meuse (Lesse, Bocq, Mollignée, &c.) have most charming valleys, which can be explored on foot, or, in great measure, with a bicycle.

France.—Avranches (Normandy). Quiet watering place, good cycling roads. *Pension, Madame Paris*.

Puys, 2 miles east of Dieppe. A little valley containing chalets and some pretty country lanes. *Hotel de Puys* (only hotel), first class and excellently situated, overlooking the small beach. Good bathing.

Convent of St. Jacul, near Dinard (Brittany). 25 to 30 francs weekly. Good garden, sea bathing and excursions.

La Guimorais (Brittany). Seaside with golf, excellent bathing. *Hotel du Golfe*. Many places of interest within easy reach by bicycle.

Rotheneuf, near St. Malo (Brittany). North aspect, grand rocky coast, sandy beach consisting of small bays. Pine forest about half-an-hour distant. *Grand Hotel de Rotheneuf*, 6 francs a day, including cabins for bathing. Suitable for quiet holiday. Ideal bathing at all hours of the day. Shrimping. Light railway passes hotel for Paramé and St. Malo, fare 25 centimes.

Paramé, St. Malo (Brittany). Quiet and pretty watering place; a fair number of hotels at reasonable prices; a good centre for exploring.

Pontazen, near Quimperlé (Brittany), south coast of Brittany; fishing on river Aven. *Hotel des Voyageurs* (Mdlle. Julia Guillot); a great place for artists.

Roscoff (Brittany); visit Dinant and Mont St. Michel on return journey. Lovely sea-coast with little rocky islands. Sailing, bathing, cycling. *Hotel des Bains*. Roscoff is an ideal place for a quiet month's rest or reading; very cheap living; splendid roads for cycling.

Tours; the garden of France; splendid centre for exploring the châteaux of the Loire. *Hotel de l'Europe*, Place de la Gare, but any good second-class French hotel will *pension* for seven or eight francs a day.

Germany and Austria.—Bingen-on-the-Rhine; quiet and restful. *Deutsches Haus*; excellent centre for excursions on the Rhine and its tributaries.

Trèves; fine scenery, very fine Roman antiquities, including a well preserved amphitheatre, &c. *Rothes Haus* (fourteenth century), very comfortable and moderate. On no account miss the journey by easy stages, cycling or walking, down the Moselle to Coblenz, 70 miles. Walkers should speak a little German.

Bollendorf; easily accessible by branch line from Luxemburg or Trèves; beautiful country in neighbourhood of historic interest outside the tourist track. French and German spoken. *Pension Barreau*, price 5 francs a day.

Diekirch, Grand Duchy of Luxemburg; good walks in spring; *Hotel des Ardennes*, 5-6 francs.

(Another very attractive and quiet place is Falaise, Normandy. *Hotel du Grand Cerf* is cheap and good.)

Dresden; German, music, boating; Saxon Switzerland. *pension, Frau Martha Wagner*, 27¹ Reichstrasse. Tuition in German or French.

Gotha; pleasant town; Thuringer Wald easy of access; many interesting excursions. *Frau Hofrata Pertsch*, 25, Dammweg, Gotha.

Munich; selected as head-quarters from which to make excursions; a healthy city, enjoying the Alpine breezes; itself unrivalled in Europe for the series of operas given by the best artists during the tourist season, and for the excellent season exhibitions of modern art—as well as permanent exhibitions. *Hotel Stachus*, inexpensive, near the Railway Station, and a tramcar centre. Best excursions (Bavarian Highlands): the Starnberg Lake; Partenkirchen and the Zugspitz mountain; Mittenwald and the Karwendel group; either at Partenkirchen or Mittenwald, moderate *pension* is offered.

Nideggen, *visâ* Aachen and Duren; G.E.R. return to Duren, 2nd, about 40s.; somewhat primitive fortified upland village, no special feature beyond the ancient castle and river Ruhr flowing through the woods 400 feet below to the convent of Heinebach. The Schloss is generally reckoned third after Heidelberg. *Hotel Heiliger*, moderate and good; Herr Heiliger will, if still at Nideggen, answer any questions. Very few English seem to know of the place. Enquire also by letter if last part of journey is still by country coach.

Niederbronn; near Hagenau, near Strasburg; almost unlimited pine woods, hills, castles in ruins, legends, modern battle-fields, cycling roads, deer. *Golden Chain*.

Sulden (Tyrol); magnificent; under the Ortler. *Hotel Eller* (6 francs).

Zell am See (Tyrol), on Innzbruch-Salzburg Railway. Pleasant town on pretty lake. Bathing, boating, mountain climbing, Alpine scenery. *Café Seehof* (cheap) and plenty of hotels. English tourists in decided minority. Good place for those who wish to speak German; though the Eastern Alps are not so fine as the Western.

Cortina, *Hotel Victoria*. 5 or 6 francs *pension*.

Switzerland.—Adelboden, above Spiez (Lake Thun), Switzerland. Fairly open valley head, about 3,000 feet; excellent varied walks and excursions. *Kurhaus*, but newer ones recently.

St. Beatenberg, over lake of Thun (near Berne); 4,000 feet elevation, 2,000 above Lake Thun. Lovely walks in all directions. *Hotel Victoria*, well built and arranged. A delightful place in August. Plenty of expeditions by lake, &c. Beautiful view of Jungfrau, Eiger, and Mönch opposite.

St. Beatenberg, above Lake Thun. Scenery and walks good. *Hotel des Alpes*. Charming place, much frequented.

Champéry, in the Val d'Illeaz, south of Lake Geneva. A charming village, situated 4,000 feet high, near the French-Swiss frontier, and offering the greatest variety in excursions; also a most healthful place for a quiet rest. *Hotel des Alpes*; but all the hotels are good *pensions*. A walking tour from Champéry across Pas d'Encel and the Susane Alpe leads to Finhaut and Chamonix. This crosses the Dent du Midi and the Tour Sallières, and offers the most wonderful approach to the Mont Blanc group.

Eggishorn (*Hotel Jungfrau*), 7,195 feet high, above the Rhone Valley, and on the border of the grand Aletsch glacier. The famous Mürjelen Lake is a little above the hotel. A fortnight's notice at least must be given to the hotel manager. One day's stay is no use, expensive and fatiguing—must go for several days *en pension*.

Lac Champex, sur Orsières, Martigny; 4,485 feet above sea; very pleasant; good walks without guides. *Pension Veuve Bische* (4 francs a day board and lodging).

Grindelwald; high Alpine resort; good climbing centre; *Eiger Hotel, Pension Scheiigg, Pension Wölter*, &c. Ex-

cursions to Lauterbrunnen, Murren, Interlaken, easily combined with tour to Lucerne.

Saas Fée; climbing centre. No railway to bring crowds. *Grand Hôtel de Saas Fée*. An ideal place, suitable both for climbers and "loafers."

Lugano, *Hotel du Parc*; Sicily pension.

Miscellaneous.—Florence, *Hôtel Anglo-American*.

Greece, specially Peloponnese.

Egypt, Helouan.

The Pyrenees, Luchon, Cauterets, Baréges, &c. By no means dear, barring the journey, especially for those who can walk; walks endless. 8 to 10 ff. per day at many good hotels. *Wiese neu Davos*, 7 to 10 ff.

Merok, Norway, on the Geiranger; wild wood and mountain; snow line easily accessible in summer. *Hotel Union*. Cost 4 to 5 kroner a day in the season.

Kristiania, Norway; a good centre for some of the finest scenery in Norway; English spoken everywhere. The Norwegians homely and good-natured, and very kindly disposed towards the English.

Copenhagen, Denmark. A fine, clean city, with many very interesting places within easy reach; expense of living moderate (4 kr. per day and upwards). The Danes most kind and hospitable. Educational institutions of a very advanced character. English spoken everywhere in Denmark, except in remote country places, where German is always understood.

NATURE NOTES FOR JUNE.

By the REV. CANON STEWARD, M.A.(Oxon.),
Principal of Salisbury Training College.

Animal Life.—Most small birds are now hatching their eggs; but some now commence to lay, as the Spotted Flycatcher, Reed Warbler, Grasshopper Warbler and Quails. Mallards assume Duck plumage. Hobby Falcons breed sparingly in the New Forest, as would the Honey Buzzard if left unmolested. Barn Owls may be seen hawking over long grass in the late evening.

This is a busy month for entomologists, who may observe:—

Butterflies.—Fritillaries pearl-bordered, Glanville and Duke of Burgundy; Highbrown; Tortoiseshells; Blues, Chalk Hill, and Small; Brown Argus; Clouded Skipper; Comma; Meadow Brown; Wood White; Hair Streaks, Green and Purple; White Admiral and Clouded Yellow.

Moths.—Hawk Moths, Elephant, Pine, Privet, Poplar and Eyed (trees and palings); Clearwings Bee, Hornet, Currant and others; Buff Tip; Maiden's Blush; Wave, Rivulet; Hook Tip; Barred Kitten; Wood Tiger; Procris geryon; Chimney Sweep; Red-necked Footman; Swift; Melarippe rivata; Marbled Carpet; Shark; Ghost; Plusia; Six Spot Burnet; Lobster (beechwoods), &c., &c.

The Larvæ of the following insects may be found:—Tortoiseshell, Red Admiral and Peacock (on nettles); Azure Blue (on holly); Wood White and Chalk Hill Blue (tufted vetch); Greasy Fritillary (Scabious); Painted Lady (thistles); Fritillaries Adippe, Argynnis, Aglaia (violets); Clouded Yellow (Dutch clover); Black Hair Streak (wych elm); Purple Hair Streak (oak); Brown Hair Streak (birch and sloe); Camberwell Beauty (willow and nettle); Striped Hawk Moth (vine, galium); Cinnabar Moth (Ragwort), Tiger Moth, &c.

Plant Life.—Search for the following plants in flower:—

On heaths and meadows: Meadow Vetchling, Geranium, Bladder Campion, Trifolium procumbens, Field Scabious, Wild

Carrot, Solanum or Bitter Sweet, Small Scabious, Small-flowered Gentian. In woods and hedgerows: Raspberry, Dog-rose, Buckthorn, Bryony, Guelder-rose, Foxglove, Hedge Woundwort, Tufted Vetch, Vicia Sylvatica, Honeysuckle, Great Hedge Bedstraw, Prunella, Enchanters Nightshade, Wood Betony, Hypericum Hirsutum. In moist places and ditches: Yellow Flag, Scrophularia, Marsh Thistle, Water Dropwort, Water Cress, Meadow Sweet, Veronica Anagallis, Myosotis palustris, Wild Valerian, Meadow Rue, Galium palustre, Marsh Ragwort, Polygonum amphibium or creeping Loose-strife, and Alisma plantago. Chalky and dry places: Orchis ustulata, maculata, pyramidalis and apifera; Musk Thistle, Wild Thyme, Gymnadenia conopsea, Ladies' Bedstraw, Smooth Heath Bedstraw, Mallow, Mullein, Creeping Cinquefoil, Veronica officinalis, Burnet Saxifrage, Small Woodruff, Campanula glomerata, Ragwort, Willow Herb. On walls: Biting Stonecrop. In fields: Red Corn Poppy, Scarlet Pimpernel, Centaurea scabiosa, Convolvulus, Agrimony, Corn Cockle, Linaria vulgaris, Chamomile, Climbing Buckwheat, &c.

Trace the above plants to their natural orders and examine Orchid fertilization.

Folk-lore.—Collect proverbial sayings:—

"Mist in May and heat in June
Bring all things in tune."

"A dripping June keeps all in tune."

"June damp and warm does the farmer no harm."

"Barnaby bright (June 11th), all day and no night."

"St. Barnabas: mow your first-grass."

CURRENT GEOGRAPHICAL TOPICS.

By A. J. HERBERTSON, M.A., Ph.D., F.R.G.S.

Volcanoes of Martinique and St. Vincent.

In a former article (THE SCHOOL WORLD, July, 1899) it was pointed out that the Lesser Antilles consist of an inner volcanic and an outer limestone chain, rising above a narrow sub-marine ridge, which slopes steeply to the Atlantic and to the Caribbean Sea. Active volcanoes exist in this inner chain, as well as in many fumaroles and solfataras, while the instability of the region is further shown by many earthquakes. It lies, in fact, where the Mid-World belt of depressions and heights meets the "ring of fire" which girdles the Pacific; and it is worth noting that the East Indies, the other region of intersection of these bands of instability, has also been the scene of violent eruptions in recent years, e.g., at Krakatao in 1883.

At the beginning of May reports came to hand of volcanic activity in Mont Pelée, a cone in the north of Martinique, 4,430 feet high, in the crater of which reposed a tranquil lake. In 1851 an eruption of ashes proved that the volcano was not completely extinct, but it did no serious harm; and doubtless the remembrance of this led the inhabitants to believe that "Old Father Pelée" would not do more damage than half a century ago. Unfortunately Mont Pelée has been the scene of one of the most violent volcanic eruptions on record, to be classed with that of 1812 in St. Vincent, that of Krakatao, in the Sunda Strait, in 1883, and that of Vesuvius in 51 A.D. As far as we have news at the time of writing, after lava streams had issued for several days from the crater, the top of Mont Pelée was blown off at 8 a.m. on Thursday, May 8th, and a new crater formed to the west of the old one, while streams of lava poured down the western side of the mountain, and the seashore for miles was burning, and on Friday, May

9th, it was too hot to land, while ashes covered all the district around. Unfortunately the island of Martinique is densely peopled, and the town of St. Pierre lies at the foot of the western slopes of the mountain, down which the lava streams flow. Glowing ashes and mephitic gases seem to have caused most of the destruction. Thirty thousand people are reported to have perished. All the shipping in the harbour was sunk by the resulting wave, except the *Koraima* and the *Roddam*. Some of the crew of both were saved, and the escape of the *Roddam* was due to the heroic action of the captain, who steered the ship out to sea. All except himself were dead or temporarily disabled by burnings, to which he has since succumbed. Two telegrams are specially noteworthy. One says that the volcanoes have not altered their normal condition. The other reports that the cable ship found the broken end of the cable, which parted at 300 fathoms, at a depth of 1,200 fathoms, which shows that very considerable submarine changes have also been brought about. Associated with these is the sinking of the sea and the formation of a wave which did some damage, while some accounts describe the water as scalding.

Martinique is "the central bead in the great necklace that encircles the throat of the Caribbean Sea," and lies in the direct route from Europe and Panama, being some 4,200 miles from Bordeaux and 2,000 miles from New York. It is 50 miles long, and nearly 20 miles wide, with an area of 370 square miles. It is entirely volcanic in structure, the trachytic rocks forming the more rounded *mornes*, the basalts the sharper-pointed *pitons*. The pitons of Pelée and Carbet (3,960 feet) lie in the north, while a low axial range connects them with the mornes of the south, rising to about 1,600 feet in Vauclin. These are all deeply dissected by valleys, cut out by torrential streams, for the rainfall is very heavy, especially on the windward (eastern) sides. The island is covered with thick tropical forest, "which cannot be described, photographed, or painted"; but for a brilliant attempt see the quotation from Dr. Ruiz, in Hill's "Cuba and Porto Rico" (Fisher Unwin), also in back numbers of the *Century Magazine*.

Two harbours of importance exist on the west or lee coast. That of Fort de France (15,000 inhabitants), the capital, is one of the best in the West Indies, and is the headquarters of the French Navy in these seas, protected by the batteries of a fort in the volcanic heights of the peninsula which divides the two bays which form it, the inner eastern one of which is well sheltered. Fort de France (formerly Fort Royal) was half destroyed by earthquakes in 1839, and by fire in 1890. Saint Pierre (25,000), at the foot of Mont Pelée in the north, is on a semicircular bay, and is not so sheltered. It is described as a solidly-built town, whose houses, painted yellow, border narrow streets down which abundant water flows. It contained many images and statues, one of Christ above the bay, one of the Virgin on the Morne d'Orange, and one "Mother of the Watch" above the harbour. "The market place is most picturesque. It is in the middle of a square surrounding a fountain, and filled with countrymen dressed in gorgeous oriental colours, selling their little products—oranges, bananas, vanilla beans, cacao—while the fishermen lift their boats bodily out of the water and convert them into stalls, where can be seen a most wonderful fish display, rivalling in colours the tints of the rainbow" (R. T. Hill).

The population of Martinique, one of the best cultivated of the Lesser Antilles, is 187,000, of whom 100,000 are métis, 50,000 negroes, 20,000 whites, and 17,000 coolies from India and China. The creoles (here applied to black and white alike if belonging to the island) are noted for their superb figures and bearing as well as for their gorgeously coloured robes.

St. Vincent.—The volcanic outbreak was not confined to Martinique, but the two volcanoes of St. Vincent, the Soufrière

and Morne à Garou, have also been unwontedly active, not without serious loss of life (estimated at 2,000), although not to the extent of that in Martinique. It is reported that the northern part of the island has suffered most. The sounds of the explosions on St. Vincent were heard at Barbados, where a thick layer of ashes has fallen. Barbados lies almost due east of St. Vincent, in a region where the N. E. trade winds are persistent, so that these ashes must have been driven into the atmosphere above the trade wind layers into regions where the air is moving eastwards. This repeats the history of 1812, when part of the east of St. Vincent was blown away, and the crater of La Soufrière, over half-a-mile in diameter, with walls rising 800 feet above a lake 500 feet deep, was formed, and the dust was driven to Barbados. The existence of this lake must be remembered in connection with the violent explosion.

The island is seventeen miles by ten, and lies to the south of Santa Lucia, and is more open land formed of recent lava in the north, but containing "all the natural beauties and wonders" of the three islands to the north. Being a British island we have not such a good map or description of it as of Martinique. The area is 132 square miles; the population for 1891, 41,000, of whom 31,000 were black. The capital, Kingstown, on the west coast, is an open roadstead.

Mr. Hill's book cited above is indispensable for the study of the West Indies. A list of the best books of travel will be found in Messrs. Herbertson's "Descriptive Geography of Central and South America with the West Indies" (Black), of which Charles Kingsley's "At Last" (Macmillan) and Levkadio Hearn's "Two Years in the French West Indies" (Harper; also in *Harper's Magazine* for 1888) may be specially mentioned. The volume of "Stanford's Compendium" dealing with "Central America and the West Indies" contains a number of good descriptions and illustrations.

PROFESSIONAL OPINIONS ON THE EDUCATION BILL.

We have brought together below the resolutions actually adopted by important educational associations on the Education Bill now before Parliament, and those to be submitted to such associations by their executive committees. This collection of opinions contains the mature views of those actively engaged in the work of education, and by it teachers may acquaint themselves with the reception accorded to the Bill by the persons best able to estimate its value. It is well to point out that some well-known associations have not yet held meetings for the purpose of discussing the Bill, and that this fact explains the absence of their resolutions.

Incorporated Association of Headmasters.

The Council of the Incorporated Association of Headmasters met on May 7th, 1902, and resolved:

(1) That the Education Bill is satisfactory as providing a means of co-ordinating the various existing educational institutions within a county area.

(2) That the permissive clause of the Bill as regards elementary education should be made compulsory, so that as regards elementary education the local education authority shall assume the powers and duties of the school board and school-attendance committees.

(3) That the residue under the Customs and Excise Act should be applied, not merely made applicable, to educational purposes, and that the limit of 2d. in the £ in the rate for pur-

poses of higher education should be removed, such rate being inadequate, or already earmarked, for existing institutions.

(4) That clause 3 of the Bill should be amended by the insertion of a stipulation that the powers of expenditure therein given to non-county boroughs and urban districts be in all cases subject to the approval of the County Council.

Association of Technical Institutions.

The Council has convened a meeting of the Association, at which the following resolutions in regard to the Bill will be recommended for adoption:—

(1) That this Association cordially approves the general principles upon which the Government Education Bill is based, and strongly urges His Majesty's Government to pass the Bill in the present session of Parliament.

(2) That this Association is strongly of opinion that the new local authorities should be responsible for all grades of education in their districts, and that proper educational co-ordination would be seriously and unnecessarily hindered if this principle were not adopted: it therefore urges the Government to amend the Bill by deleting the clauses making it optional for the county and borough councils to undertake the supervision of elementary education.

(3) That this Association regrets to note that the Bill makes optional the application to the purposes of higher education of the residue under the Local Taxation (Customs and Excise) Act, 1890, and it requests the Government to make such application compulsory.

(4) That this Association regrets the exclusion of London from the Bill, and trusts that the metropolis may receive attention early next year, and, while recognising that the case of London requires special treatment, is of opinion that it would be unwise to depart from the general principles of the present Bill in the case of London.

National Union of Teachers.

While expressing satisfaction at the Government's desire to place the educational system on a sound basis, the recent Conference of the National Union of Teachers felt that the measure could not become educationally effective unless (a) the local authorities everywhere take over the control of elementary as well as of higher education; and (b) additional Exchequer grants be made to the local authorities for the purpose of easing the additional local expenditure required.

While approving those principles of the Education Bill which make for the existence of a single education committee for all educational purposes within a wide area, the Conference felt it to be essential that (c) a majority of the members of this committee should consist of elected persons, being members of the council or councils for the area, as the case may be.

Conference claimed that (d) the superior age limit of scholars attending public elementary day and all evening schools should be struck out of the Bill, as also that (e) in no case should the standard of education be permitted to fall below that which was set up in the Education Code for 1901. Connected with this was the recommendation (f) that the Elementary Education Act, 1897 (Necessitous School Boards Act) should apply in case of all expenditure incurred for elementary education under the Bill; and (g) the condemnation of the proposal that the sanction of the Local Government Board should be required before any locality may levy a rate of more than 2d. in the pound for the purposes of higher education, the Conference affirming that the question of expenditure from the rates is a matter for the ratepayers themselves.

Three recommendations in regard to religious and personal freedom were made: thus (h) the protection of a conscience

clause should be extended to all scholars or students in any school or college, residential or day, which receives aid from the local authority; (i) it should be illegal to impose compulsory extraneous tasks upon any teacher serving in a school receiving public aid; and (j) the dismissal as well as the appointment of teachers in all schools should be subject to the consent of the local authority.

Conference was also anxious that (k) provision should be made for the adequate and suitable instruction of young teachers, and for safeguarding the interests of properly-equipped pupil-teachers' centres; as also that (l) teachers should have the right to compensation in case of their office being abolished or unreasonably modified.

It was recommended (m) that all public education in London, primary and higher, should be placed under the control of a directly-elected board of education for London, devoting itself exclusively to purposes of educational administration; (n) that in Wales the local education authorities should be constituted on the same lines as in England.

Private Schools Association.

The Private Schools Association has made no public declaration on the subject, but the views of its Executive on the secondary clauses of the Education Bill are expressed by the amendments of which their President, Mr. G. C. T. Bartley, M.P., has given notice. These are as follows:—

(1) To add at the end of clause 2, "The local education authority, before supplying or aiding the supply of education other than elementary, shall institute a survey of all existing local schools within its area, with details as to accessibility, buildings, fees, number of school places, number and ages of pupils, curriculum, constitution, and number of qualifications and salaries of staff; such survey being directed to ascertain how far the schools are, *prima facie*, suitable to the needs of the locality."

(2) To add at the end of clause 3, "(a) Where the local education authority or any other persons propose to provide a new public higher education school, they shall give public notice of their intention to do so, and the managers of any existing school, and the local education authority (where they are not themselves the persons proposing to provide the school) and any ten ratepayers in the area for which it is proposed to provide the school, may, within three months after the notice is given, appeal to the Board of Education on the ground that the proposed school is not required, or that a school provided by the local education authority or not so provided, as the case may be, is better suited to meet the wants of the district than the school proposed to be provided, and any school built in contravention of the decision of the Board of Education on such appeal shall be treated as unnecessary.

(b) The Board of Education shall determine in case of dispute whether a school is necessary or not, and in so determining, and also in deciding on any appeal as to the provision of a new school, shall have regard to the interest of secular instruction, to the wishes of parents as to the education of their children, and to the economy of the rates, but a school actually in existence shall not be considered unnecessary in which the number of scholars in average attendance as computed by the Board of Education is not less than thirty."

TEACHERS of history will be glad to learn that Mr. J. S. Lindsey has arranged, according to periods and topics, all the history questions set for matriculation at London University from June, 1888, to January, 1902. The questions are divided into twenty-four test-papers, and may be obtained from Messrs. Heffer & Sons, Cambridge, price eightpence. The booklet also contains useful suggestions as to the best way of using the questions.

ITEMS OF INTEREST.

GENERAL.

THE Education Bill passed the second reading by the large majority of 237. The debate was, on the whole, characterised by its seriousness and good sense. Both sides of the House showed an earnest desire to improve English education, and the way in which contentious subjects were handled augurs well for the success of the work to be done in committee. Important suggestions for the improvement of the Bill were made both by Government supporters and members of the Opposition. The amendments, of which notice has been given, run to thirty-eight printed foolscap pages and the committee stage must be a very protracted one. But we are hopeful that the Government will make full use of the expert knowledge possessed by many members of the House in finally deciding the details of the Bill.

THERE seems every likelihood that the permissive clauses of the Bill will be removed. But both must go. It is no use to make the provisions as to elementary education compulsory and to leave the option in the case of secondary education, for this would mean postponing indefinitely an improvement in what many regard as the weakest part of English education. Similarly, there seems no very good reason why the 2d. limit to the rate for education other than elementary should be retained. If a progressive council desires to spend more on secondary education they should be encouraged to do so. As was pointed out in the debate, the expenditure on secondary education will in future have to be much more than in 1896, for recent legal decisions have largely increased its scope. These and many similar points are all dealt with by amendments and will be sure to have careful consideration.

ALL educationists who have the welfare of the University of London at heart, and desire an adequate provision of higher education for the Capital of the Empire, hope that the authorities of University College will be successful in securing at an early date the million pounds for which they have issued an appeal. This sum, which by the application of standards current in this country appears large, but compared with the amounts available in America is relatively insignificant, is necessary to ensure the incorporation of University College in the University of London. The Senate of the University has laid down the conditions in accordance with which the incorporation can be effected, and it is in order to comply with these conditions the Council of University College require the amount being raised. The Special Appeal Committee, including, as it does, men influential in nearly every quarter, should have no great difficulty in securing the fund required, and we trust they will be soon successful.

THE provision of a worthy University of London, with adequate facilities for the higher education of seven millions of inhabitants, is, however, a larger question than that of securing the incorporation of University College. While we earnestly desire the attainment of this proximate end, we look forward to the time when there will be, incorporated in the same thorough manner which is desired in the case of University College, a considerable number of colleges situated in every part of the metropolis. Besides University College there are two other colleges of similar rank, and, in addition, many other colleges and some thirteen or fourteen polytechnics which with but little modification could become, with advantage to the University and to the Capital itself, constituent colleges able and willing to take an important part in providing university education in a manner consonant with the ideals of the University of the Capital of the British Empire.

PARTICULARS of the new Matriculation examination for all students of the University of London are published in the official gazette. The full text of the regulations has not been published as we go to press, but the first examination under them will commence on September 15th next. An examination under the old regulations will be held in January, 1903, and under both sets of regulations in June, 1903. Matriculation candidates will be expected to show a competent knowledge in each of the following subjects, according to the details specified under the several heads:—(1) English, one paper of three hours. (2) Elementary mathematics, two papers of three hours each. (3) Latin, or elementary mechanics, or elementary physics (heat, light and sound), or elementary chemistry, or elementary botany, one paper of three hours in each subject. (4) Two of the following subjects, neither of which has already been taken under (3). One paper of three hours in each subject. If Latin be not taken, one of the other subjects selected must be another language from the list, either ancient or modern: Latin, Greek, French, German, Arabic, Sanskrit, Spanish, Portuguese, Italian, Hebrew; history (ancient or modern), logic, physical and general geography, geometrical and mechanical drawing, mathematics (more advanced), elementary mechanics, elementary chemistry, elementary physics—(a) heat, light, and sound, or (b) electricity and magnetism; elementary biology—(a) botany, or (b) zoology.

It will be seen that Latin is no longer a compulsory subject for the London University Matriculation, but if it be not taken, another language, either dead or living, must be offered. The new regulation will probably lead to a considerable increase in the number of students graduating in science, since the examination in Latin has, we understand, prevented many older students on the science sides of many colleges from taking a degree. On the other hand, it is now possible for a student to matriculate and yet to be completely ignorant of science. Some teachers will regret that history and the geography relating thereto are no longer obligatory; but, on the other hand, the recognition of geography as a separate subject will give distinct satisfaction to others.

THE Regulations for the Senior, Junior, and Preliminary Oxford Local Examinations have been published a month earlier this year. Numerous changes have been introduced. Arithmetic is no longer an obligatory subject, and the conditions for passing in religious knowledge, mathematics and physics have been altered. New schedules have been issued for all the prescribed branches of natural science. An important notice relates to the examination in geometry. In future questions will be set so as to bring out as far as possible a knowledge of principles, a smaller proportion than heretofore consisting of propositions as enunciated in Euclid. Any solution which shows an accurate method of geometrical reasoning will be accepted, and geometrical proofs of the theorems in Book II. will not be insisted upon. We hope to give a list of the set books in our next number.

BEFORE visiting a strange country or district it is always a good plan to obtain as much information as possible about it from trustworthy guide books and works of travel. The difficulty frequently experienced is to know what books or maps are the best to study; and many teachers will be glad to avail themselves of facilities offered by Mr. Edward Stanford, Long Acre, London, W.C., the geographical publisher. With his permission we are able to announce that he will be pleased to send any reader of THE SCHOOL WORLD a list of the best books and maps upon any district which it is intended to visit during the forthcoming vacation. Upon receipt of a post-card mentioning this magazine, and giving the name of the country or province about which information is required, Mr. Stanford will send a manu-

script list of the best publications available upon it. This offer will, no doubt, be well appreciated, and we trust that our readers will not hesitate to avail themselves of it. The list of favourite holiday haunts which we give elsewhere in this issue will suggest many places in which delightful holidays may be spent.

AN excellent opportunity to spend a short holiday in Belgium at a low cost is offered to pupils in the upper classes of girls' schools, or young teachers, by Miss Edna Walter, one of H.M. Inspectors of Secondary Schools. Arrangements have been made for the accommodation of a party of about twenty to leave London on July 24th for Heyst, a Flemish watering-place on the North Sea, where a week will be spent in visits to places of interest in the neighbourhood. The centre for excursions in the second week will be Bruges, and the party will return to England on August 6th. The cost for the holiday will be five guineas, which includes fare from London (2nd class rail, 1st class boat) and board and lodging during the fortnight. A second visit will probably be made from August 7th to August 20th, the chief places to be visited during this trip being Brussels, Malines, Antwerp and Louvain. The cost in this case will be six guineas for the fortnight, this sum including fares, food and lodging as before. The trips have been arranged solely with the desire to enable a small party of girls and young women to pay a visit to the Continent in charge of a responsible person, and in pleasant company, at the lowest possible cost; for the charges made only just cover the expenses. Miss Walter will be accompanied by two colleagues, one of whom, Miss R. H. Steel, is an excellent linguist. Mistresses or guardians who desire further particulars should write as soon as possible to Miss Walter, B.Sc., 38, Woodberry Grove, Finsbury Park, London, N.

THE study of nature has always had enthusiastic advocates, and many of these are to be found in the ranks of acting teachers in secondary and elementary schools. An excellent opportunity of estimating the importance of the work done in this direction is afforded by a detailed review of the provisions for instruction in "Nature Knowledge" by the English County Councils, contained in the current number of *The Record* of the National Association for the Promotion of Technical and Secondary Education, and compiled by Mr. Wilfrid Mark Webb. But though local authorities have been commendably active in directing the attention of teachers to the advantages accruing from a study of natural objects and phenomena, there is a wide divergence of opinion as to what should be the aim and scope of teachers of "Nature-Study." While some exponents desire to accentuate the informality and want of definition of their demonstrations, the lessons of other teachers are indistinguishable from those usually imparted under the name of Elementary Science. It is to be hoped that the forthcoming Nature Study Exhibition to be held at the Botanic Gardens, Regent's Park, in July next, will assist in making clear to teachers the lines their instruction may advantageously follow.

THE managers of any elementary school who wish the school to be certified as efficient will, on writing to the Secretary, Board of Education, Whitehall, S.W., receive instructions as to the manner in which their application is to be conducted. The Board, on agreeing to entertain the application, will direct one of His Majesty's Inspectors to visit and report on the school. The Board must be satisfied that: (a) Elementary education is the principal part of the education given in the school, and that the ordinary payments, in respect of the instruction, from each scholar do not exceed 9d. a week; (b) the school is not conducted for private profit, and is not farmed out by the managers to the teacher. The managers must be responsible for the payment of teachers, for the conduct of their schools, for their

maintenance in efficiency, and for the provision of all needful furniture, books, and apparatus, including the Code and Revised Instructions for each year. The school must be open at all reasonable times to the inspection of His Majesty's Inspectors.

THE Board of Education has issued a circular giving the general principles on which courses of study are to be framed for students who enter training colleges for one year's work only. As some of our readers may know, any graduate, or person qualified to become a graduate of any British university, may enter a training college for one year instead of two, and so may any certificated teacher who has not previously been trained during two years. The circular states that it will probably be found expedient for the college authorities to direct the attention of graduates mainly to the theory and practice of teaching, drawing, music, needlework, manual instruction, and physical training and similar subjects, for the reason that their academical training will probably have qualified them in the other subjects of a training-college course.

WE have received a copy of the illustrated outline (64 pp.) of the Special Course in Natural History for Training College and King's Students which will be held during the Summer Session at Marischal College, Aberdeen University. The class will be conducted by Mr. John Rennie, B.Sc., and will be under the supervision of Prof. J. Arthur Thomson. The syllabus is divided into four parts: (1) a general course of exercises in description, classification, and observation of habits of living animals and of the adaptation of their structure to function; (2) the study of common animals from the points of view of structure, function, life history and habits; (3) the identification and observation of common animals in relation to particular haunts; (4) microscope work. In one appendix Prof. Thomson makes suggestions (already contributed in a more extended form to *THE SCHOOL WORLD*) for seasonal nature-study in schools, and also outlines a course of ten lessons on "The Web of Life." In a second he suggests various problems the solution of which may be reasonably attempted by young naturalists. Teachers of Nature Study should endeavour to procure a copy of the syllabus.

THE annual exhibition of work executed in the Board Schools of London will be held in the Examination Hall, Victoria Embankment, W.C., on Wednesday, June 18th, and the three following days. The exhibition will be opened by Lord Reay (Chairman of the Board) at 3 o'clock, and will include specimens of drawings, colourwork, modelling, woodwork, wood-carving, metalwork, needlework, infants' work, cookery, laundrywork, housewifery from the day and evening schools, work from the schools for the blind, deaf and special instruction, and also work from the truant and industrial schools. There will also be included scientific apparatus which has been constructed by the teachers and pupils.

THE language of the public-school boy is a tempting branch of etymology and forms the subject of an interesting article in the *May Cornhill Magazine*, by Mr. Nowell Smith, himself an old Wykehamist. Referring to the school language of Winchester College Mr. Smith says: "It preserves many words which were very good English some centuries ago, and some which are not far from being good Hampshire now. Thus, to 'lobster,' which is still the Winchester 'notion' for to 'cry,' is probably the Hampshire 'louser,' to make a disagreeable noise, though it has been suggested that the term is derived from the redness of the eyes produced by that exercise. To 'firk' or 'ferk' means in the ordinary parlance of Wykehamists to 'send' a person. You can be 'firked up' so many places, 'up to books' (*i.e.* in class); or, for a grave offence, you may be 'firked' altogether. *Naturam expellas furca* has, of course, suggested

an etymology for the word suitable to this last and tersest use of it; but it refuses, like Nature, to be expelled with the pitchfork into the Latin language, and is found in Old and Middle, and even Modern English." The essay abounds in examples from many other public schools and should be read by those schoolmasters who have not yet done so.

THE Civil Service Commissioners announce that a competition for at least one Junior Appointment in the Supply and Accounting Departments of the Admiralty will be held in London, Edinburgh, and Dublin, commencing on July 15th, 1902. The limits of age are 18 and 20. The examination will be in the following subjects, viz. :—*Class I.*—Mathematics I. (elementary, including arithmetic, algebra to the binomial theorem, Euclid i., iv. and vi., trigonometry and mensuration); Latin; French or German; English composition (including précis-writing) and geography. *Class II.*—Mathematics II. (advanced, including Euclid, books xi. and xii., geometrical conics, dynamics and statics); German or French; Greek; English history; chemistry and heat; physics; and physiology and geology. All the subjects of Class I. may be taken up. Only two of the subjects of Class II. may be taken up, and if one of these subjects be a modern language it must be different from the modern language selected in Class I. The salary attached to these appointments will commence at £100 a year, and, after a probationary period has been served, it will be raised to £120, and progress, by yearly increments of £10, to £200; and then by £15 a year to a maximum of £350. Assistants are eligible for promotion to higher appointments. The last day on which entry forms, obtainable from the Secretary, Civil Service Commissioners, S.W., must be returned to him is June 19th.

THE annual competition for appointments in the Civil Service of India, as Eastern Cadets in the Colonial Service, and Clerks (Class I.) in the Home Civil Service, will be held concurrently this year, commencing on August 1st. The limits of age are as follows, viz. :—Civil Service of India, 21 to 23; Eastern Cadets, 21 to 24; Home Civil Service (Class I.), 22 to 24. Candidates may compete for any one or more classes of appointments on payment of the consolidated fee of £6. The number of candidates to be selected for Eastern Cadetships is at present seven, but no information as to the number of vacancies for the Civil Service of India and the Home Civil Service is yet available. The range of the subjects of examination is very wide, embracing the most important branches of literature, science, history, philosophy, and law, and an examination of former papers will show that the examiners are not concerned to put any limit to the degree of difficulty of the questions. Further information and entry forms can be obtained from the Secretary, Civil Service Commission, S.W. The last day for the return of entry forms is July 1st.

SCOTTISH.

A COMMITTEE on Secondary Education, consisting of representatives from the Educational Institute, the Secondary Teachers' Association and the Teachers' Guild, has written to Sir Henry Craik, secretary of the Scotch Education Department, expressing the unanimous opinion that the new and modified regulations relating to the Leaving Certificate Examination will exert a beneficial influence upon education in Scotland. The Committee views with special satisfaction the restriction of the name "leaving certificate" to mark the completion of a full course of secondary education, as also, with one exception, the manner in which their Lordships, by their well-balanced grouping of subjects, propose to secure this full course in the case of each candidate. The Committee is also favourably impressed by the provision which makes the leaving

certificate depend in future on the report of the visiting examiners as to certain educational essentials which cannot be tested by written papers, and anticipates for the teachers concerned much valuable guidance from the wide experience and the high attainments which these gentlemen will presumably possess.

REFERRING to the above exception, the Committee points out that, while provision is made for a classical group and a science group, no similar provision is made for a corresponding modern group with French and German as essential subjects. It is pointed out that French and German have long been coupled together as subjects of study, and that this conjunction, with their Lordships' approval, has become a "use and wont," the disturbance of which would cause serious dislocation in the arrangements of many secondary schools. The Committee, therefore, suggests that the present conditions regulating the grouping of subjects be so modified as to permit of a typical modern group—*e.g.*, English, French, German and Mathematics—and in this way to give a uniform recognition to the various sides—the classical, scientific and modern—which have hitherto characterised Scottish secondary education.

PRINCIPAL STORY, in the course of his address at the graduation ceremony in Glasgow University, complained strongly of the circumlocution which characterised the regulations regarding the establishment of new Chairs. When an ordinance for a new chair has been drafted and accepted by the University Court and Senate it must go to the General Council, which is allowed a month to bring forward objections; and these objections, if offered, must be considered by the Court before the ordinance is issued in its final form. When so issued it is sent to the other universities, which also get a month to think over it. Then it has to lie for twelve weeks on the table of Parliament, while Parliament is sitting. Finally, it appears before the King, and if it manages to pass safely through all these hazards, it becomes law. Most people will agree with the Principal that these proceedings are unnecessarily protracted, but under present conditions it is extremely difficult, if not impossible, to secure reforms of much more vital importance than those of mere procedure.

INSTANCES of the unjust dismissal of elementary teachers have been comparatively rare in Scotland since the passing of the Education Act of 1872. The latest example of the kind is also, thanks to the attitude of the Scotch Education Department, likely to be the last. In the present case the School Board of Rhynie, Aberdeenshire, dismissed one of their teachers with twelve years' service on the ground that she was insubordinate and disloyal. The teacher affected petitioned the Department to make inquiry into the action of the Board, which she held was wrongous and oppressive towards her. In response to this petition the Department asked the Board to give specific instances of the general charges preferred against the teacher in question. These examples, when submitted, were considered by the Department to be so unsatisfactory that they suspended the school grants, severely censured the Clerk, and reprimanded the members for allowing themselves to be unduly influenced by their Clerk. The whole correspondence on the case has been sent to the press for publication by Sir Henry Craik. The letters of the Department are refreshingly direct and plain spoken, and probably never before has a public body received such a castigation at the hands of the controlling Government Department. In the correspondence the interference of the Department is justified on the ground that the effective administration of the School Board is an essential factor for the efficiency of a school. Such a statement is a truism, but it has taken almost thirty years of administration to have it recog-

nised and put in practice. The Scotch Education Department moves slowly, *mais il y arrive*.

IRISH.

THE absence of any representation of teachers on the Boards which control Secondary Education in Ireland has led to strong and united action on the part of the various organisations of teachers. The lead was taken by the Association of Roman Catholic Headmasters, and their resolution has been supported by the Protestant Schoolmasters' Association, the Schoolmistresses' Association, and the Teachers' Guild. The suggestion is that the Intermediate Education Board and the Board of Agriculture and Technical Instruction should formally agree to the establishment of a small consultative committee which should get facilities for submitting their views of proposed changes before they are finally sanctioned. The committee would consist of professional teachers chosen by the various teaching organisations, and in this way would be representative of the best educational ideas of all intermediate and secondary schools. An enlightened committee of this kind should save the authorities from many mistakes, and would materially lessen friction between them and the schools. The idea is at least worth a trial.

THE Commission on University Education has led to the formation of a Women's Graduate Association specially to watch the interests of higher female education before the Commission and to represent the views of the present female graduates of the Royal University. Committees have been formed in Dublin and Belfast which are working in co-operation, and it is proposed to lay before the Commission such definite views on the higher education of women on which there is general agreement. Although evidence has been given on behalf of women before the Commission, it is felt that this was neither fully representative nor sufficient, and that there is great danger lest the public should think the sole object of the Commission is to discover the feasibility of satisfying Roman Catholic claims and should disregard the equally important question of providing adequate remedy for the absence in Ireland of university teaching for women.

THE first series of the Margaret Stokes Memorial Lectures were delivered in the Alexandra College, Dublin, on April 26th, 28th and 29th, by Prof. Kuno Meyer, who was introduced by Dr. Mahaffy. The subject of the lectures was "Civilisation in Ireland during the Early Christian Centuries 400-800, A.D."

THE Report of the Intermediate Education Board for Ireland for 1901 was presented to Parliament at the end of April. It may be divided into two parts. First, a report of the results for the year 1900-1901. The number of students who passed in 1901 was: boys, 3,752; girls, 1,580; total, 5,332. Excluding over-age students, the percentage that passed was: boys, 65·8; girls, 69·8; boys and girls 66·9. The amount of results fees paid to managers of schools was: boys, £41,003 9s. 7d.; girls, £15,756 8s. 5d.; total, £58,759 18s. Of the 5,332 students who passed the examination in 1901, results fees were paid on 5,134, the average fee being, therefore, £11 1s. 6d. per student. Besides this there are the expenses of management, of holding the examination, and the examiners' fees. The total income exceeded the expenditure by £1,369 9s. 6d. The second part deals with the changes introduced by the Board for the year 1901-2, in consequence of the Act of Parliament of August, 1900, following on the report of the Intermediate Education Commission of 1899. These changes have already been dealt with in this column.

THE Commission on University Education has been making a tour through Ireland, and has taken evidence at Belfast,

Galway and Cork, mainly from the professors of the Queen's Colleges in those places, and at Londonderry from the professors of the Magee College. The evidence dealing with the College at Galway and the proposal that has been made to convert it into an agricultural college have drawn from Sir Thomas Moffet, a former President, an article in its defence in the May number of the *New Liberal Review*, in which he maintains that a review of the subsequent careers of Galway students clearly shows that the institution has not been a failure as a college of liberal education.

WELSH.

THE great event, educationally, in Wales, during the last month, was the installation of the Prince of Wales as Chancellor of the University of Wales, at Carnarvon. The Prince, in his speech at the luncheon after the ceremony, especially congratulated the University on the useful Fellowship Fund, and in the course of the meeting it was announced that he had himself made a contribution of £100 to it. One of the features of the ceremony was the reading of an address in Welsh from the Guild of Graduates. The degree of LL.D. was conferred on the Prince, after which, as Chancellor, he conferred honorary degrees on those selected by the Senate and Court to receive them, viz., Doctor in Music on the Princess of Wales; the LL.D., Lord Balfour of Burleigh, the Earl of Rosse, Dr. Edward Caird, Master of Balliol, Sir R. C. Jebb, M.P., and on Lord Justice Vaughan Williams; the D.Litt. on Dr. J. A. H. Murray and Principal John Rhys. In the course of the meeting a telegram was read from Sir Alfred Jones guaranteeing twelve scholarships of £30 a year for three years at the University College of North Wales, Bangor.

PREBENDARY MOSS, Headmaster of Shrewsbury School, distributed the prizes at the Friars School, Bangor, recently, and dwelt upon the inadequacy of the hours allotted in the time-table for classical instruction in the intermediate schools. He quoted from Dr. R. S. Conway: "This is not a matter of mere academic interest. It means, on the one hand, that some of the ablest and most devoted teachers in the Principality, men who inspire their pupils with the keenest interest in knowledge and with high ideals of work, are being subjected to a grave hardship; and on the other, that the boys who are working at one of the most venerable subjects of study are given plainly to understand that whatever their unhappy teacher or they themselves may think about it, the chief authorities of their school, who determine its time-table, do not regard it as worth learning at all, except in holes and corners of time, and—it may be suspected—of the school-building also." The Headmaster of the school, in criticism of Prebendary Moss's view, has stated his opinion is that it is not a question of "time-tables," but "the establishment of a number of schools grossly in excess of the higher educational needs of the population," whereby in any particular school, the number being so small, and the staff being also necessarily limited, due differentiation according to the demands of higher instruction becomes difficult, and the claims of the many have to have precedence over the needs of the few who wish, and are able to specialise in higher work. Such a view suggests, at any rate, that there must be a liberal staff in the intermediate schools.

THE important question of the site for the new buildings of the University College of North Wales has been settled. The members of the College Staff were unanimously in favour of the Penrallt and Park site, and it may be taken for granted that they would be the keenest judges on such a matter. In the Court of Governors the adoption of this site was carried, 54 voting for it, and 13 being neutral, and none against. There had been offers of sites at the following places: Llandudno

Junction, Wrexham, Carnarvon, Prestatyn, Rhyl and Denbigh. The Mayor of Bangor stated that the Manchester Town Hall could easily be built twice over on the new site.

LAST month a Conference of Teachers of the intermediate and technical schools of Wales was held at Blaenau Festiniog. A whole day, with morning and afternoon sessions, was devoted to the subject of science teaching in Wales, and it is not too much to say that it was the most representative gathering ever held of the science and mathematical teachers of Wales. The morning paper, by Mr. J. Griffin, of the Festiniog County School, was on "the Teaching of Science as a Preparation for Industrial Life." It was followed by a paper on "the Value of Biological Teaching for Girls," by Miss Holmer, of Llanelly County School. In the afternoon, Dr. J. J. Findlay, of Cardiff County School, read a paper on "the Condition of the Teaching of Science and Mathematics." The second paper was on "Nature-study as an Introduction to Science," by Mr. William Saunders, of Llandrindod Wells. Not only were the papers suggestive and helpful, but the discussions showed the amount of living interest in science that is to be found amongst Welsh teachers. Principal Griffiths, F.R.S., of Cardiff University College, spoke with much enthusiasm of the Conference.

CURRENT HISTORY.

WE hear there is a movement in the Scandinavian peninsula which has for its object the "permanent neutrality," towards all other possibly belligerent states, of the kingdoms of Sweden, Norway and Denmark. Is, then, "the North" an entirely extinct volcano? Is the home of the Vikings to be the first fulfilment, on a large scale, of the old-world prophecy that "nations shall not learn war any more"? We know that the cismontane fragments of the "Middle Kingdom" of 843 which have become independent—Holland, Belgium and Switzerland—are "permanently neutral," and that their neutrality is guaranteed by the public law of Europe. And we mildly wonder, whenever we hear of an increase in their military forces, why it is they can want them. But the neutrality of these three States is explicable on the same ground as that of Monaco or Andorra. They are too small to fight their big neighbours. But that the land which once colonised with war-like expeditions northern Gaul and southern Italy, which discovered America and conquered England, which founded modern Russia and saved Protestant Germany from extinction, which shone like a meteor in Charles XII. and helped twice to defy the almighty seapower of Great Britain—that this region should lay aside all thought of war sets us thinking of its ancient days, and makes us doubt if, like Vesuvius before 70 A.D., it is really so extinct as it seems. What would wake its fires again?

"IN March this year 600 young men from the districts of Laconia and Messenia left the Piræus for" distant lands. This is not an extract from Grote, nor his authorities, Herodotus or Thucydides. It is from an English newspaper of current date. But how it takes our thoughts back, and then with a sudden shock brings them up to date again! There is a "sacred spring," and young men are leaving their homes in Hellas. But they are not going from a city, but from districts. It is not Athens or Corinth or Sparta, self-contained Hellenic communities, that are making a new Athens or Corinth or Sparta across the Mediterranean seas. They will take no sacred fire, they will not begin their new settlement in untrodden lands, they will not be extending Hellas. No, they are a miscellaneous collection "from Laconia and Messenia," and they are going to—New York! And they state as motives for their emigration, "poverty, insecurity in rural districts owing to depredations of

outlaws, to the exactions and misgovernment of local officials." Yet, in the twenties of last century, Europe was moved to action to save Hellas from the "unspeakable Turk" and to make her a free country wherein righteousness was to dwell. And here is the result! The flower of Greece prefer the U.S.A. to their fatherland. Our fathers lived in an age of hope. We are living in an age of disillusion.

"DEMOCRACY" is on its trial still in the United States of America. An "effete monarchy," and, our Protestant friends would add, a "priest-ridden country," failed to govern Cuba and the Philippines "with common humanity." Magnanimous "America," like a second Perseus or St. George, came to her rescue. The "monster" was slain, or, at least, forced to release his prey. And now, what do we hear? The Filipinos do not, at least, love their deliverers and are with difficulty "persuaded" to let them rule over them. And the "persuasion" seems to be accompanied with ugly proceedings which are demanding enquiry. Cuba, too, does not seem to anticipate much improvement in her economic interests. One of her chief productions is sugar, and whereas under the Spanish rule she had the benefit of preferential-tariff treatment, the beetroot interest in the United States is clamouring to exclude the produce of the Cuban cane to protect their own markets. The civilised world waits to see what Congress will do, and at this distance we hear too much of party manoeuvres in that body to make us feel quite sure what the result will be.

IN these columns we ignore, of course, all partisan views, and we therefore do not judge the late Cecil Rhodes. But assume for the moment a favourable view of the man. Were it not that our British Empire is large enough to contain many such as he was, we might hail him as a king; at least, in the primitive sense of that word—a Kin-ing, or man of the tribe. Taking him at his own valuation, he lived, and died, for the Anglo-Saxon race. His will has already been compared in the newspaper press to that of Julius Cæsar, and the parallel between the two men might well be pushed further. But we may find other parallels nearer home. Is there not something in common between Cecil Rhodes and those mediæval heroes of our own, Edward I. and Henry V.? Edward Plantagenet was our first great English Imperialist, with ideas of conquest in Wales, Scotland and Guienne. Read his pathetic speech in Westminster Hall recorded by the Latin chronicler. And Henry V. had an "Anglo-Saxon" mission not only for distracted France, but for distracted Christendom. Read the history of the Council of Constance if one would know the true measure of Henry V. Such ideals "fulfil themselves in many ways."

SENIOR OXFORD LOCAL EXAMINATION, JULY, 1902.

Revision Test Papers.

Arithmetic.

PASS PAPER.

- (1) (i.) Divide the product of $\frac{2}{3} + \frac{1}{2}$ of $4\frac{1}{2}$ and $\frac{1}{3} - \frac{1}{8}$ of $3\frac{1}{2}$ by their difference.
- (ii.) Explain why '9 may be written as unity.
- (2) Subtract '0375 of an acre from a square chain.
- (3) Extract the square root of '2 to four decimal places. Certain further places in the result can be found by ordinary division. Find those places.
- (4) A man starts on a bicycle tour with a £5 note, two sovereigns, and some small change. He spends a half of his money in lodgings, a third in refreshment, and $\frac{1}{4}$ in repairs to his machine, and has 12s. 5 $\frac{1}{2}$ d. left. How much small change had he at the start?

(5) A rectangular block of wood 4 feet 6 inches long by 3 feet 6 inches wide is worth £1 19s. 4½d. Another block of the same height and 5 feet 6 inches long by 4 feet wide is worth £2 5s. 10d. If the wood of the first block is worth 6d. per cubic foot, what is the value of a cubic foot of the second block?

(6) What is the difference between the simple and the compound interest on £320 for 4 years at 3 per cent. per annum? Answer to the nearest penny.

(7) Find the weight of the water contained in a cistern 10 feet by 3 feet 6 inches by 10½ inches, assuming that a cubic foot of water weighs 1,000 ounces.

(8) A man's expenses amount to 17s. 1d. per £ of his annual income, and he saves £87 10s. od. in the year. What is his income?

(9) A table 2 feet 6 inches by 1 foot 9 inches is to be inlaid with an oblong design 4 inches by 3 inches in the centre, and a border 3 inches wide running round the edge of table, and the whole table is to be polished. If the inlaying costs 6d. per square inch and the polishing 6d. per square foot, what will be the total cost of doing up the table?

(10) The hot-water tap of a bath will fill it in 15 minutes and the cold-water tap will fill it in ten minutes. A bather wishes to have the bath half full and to have twice as much cold water as hot. He starts both taps running together and turns each off once only. At what time after the start does he turn off the respective taps?

(11) A person bought £2,500 of a certain stock at 97½ and sold out 6 months afterwards at 97, having received one half-year's dividend at the rate of 4½ per cent. per annum. What rate per cent. per annum did he receive for the half year on the money he invested?

Answers.

(1) $\frac{5}{8}$. (2) 10 square poles. (3) 44721359. (4) 9s. 6d. (5) 5d. (6) £1 15s. 3d. (7) 17 cwt. 10 lb. 1 oz. (8) £600. (9) £4 os. 2½d. (10) Hot, 2½ min.; cold, 3½ min. (11) 3½.

English Grammar.

(1) Analyse the following:—

No longer mourn for me when I am dead
Than you shall hear the surly sullen bell
Give warning to the world that I am fled
From this vile world with vilest worms to dwell:
Nay, if you read this line, remember not
The hand that writ it; for I love you so,
That I in your sweet thoughts would be forgot,
If thinking on me then should make you woe.

(2) Correct or improve the following sentences, giving reasons for the change:—

(a) As a general rule, the teacher can only take one pupil at a time.

(b) After painting the picture the artist died.

(c) He got commended for his zeal by the general.

(d) Writing on the specially prepared paper the copies may easily be taken.

(3) Distinguish, with examples, the different grammatical uses of the following words:—*Up, round, that, but, when.*

(4) Explain and illustrate the use of these terms:—Objective complement, antecedent, prepositional phrase, gerund, impersonal verb.

(5) Classify, as accurately as you can, the consonantal sounds used in English.

(6) Write a short account of the origin of adverbs. Give reasons for or against the inclusion of *yes* and *no* amongst adverbs.

(7) What is meant by *tense*?

Draw up a complete scheme of the tenses, active voice, indicative mood, of the verb *proffer*.

(8) Comment on the form of these words:—*Bridegroom, methinks, gospel, likelihood, clomb, could, helpmate.*

English History, 1066-1399.

(1) What do you understand by the term Feudalism? Show its influence on English history during the Norman period.

(2) In what ways did the Norman Conquest affect the Church in England?

(3) Explain and illustrate the meaning of the terms: *Attainder, Curia Regis, Estates, Impeachment, Ordinance.*

(4) State clearly the questions at issue between (a) Henry I. and Anselm, (b) Henry II. and Thomas of Canterbury. Sum up the results of each conflict.

(5) Explain the importance of *Magna Carta*.

(6) Trace the development of Parliament either (a) in the thirteenth century, or (b) the fourteenth century.

(7) Briefly consider the relations of England and France in the reigns of Edward I., Edward III., and Richard II.

(8) Sketch the relations of England with either Wales or Scotland throughout your period.

European History, 1095-1254.

(Not more than SIX Questions to be attempted. Introduce references to English history whenever possible.)

(1) Account for the success of the First Crusade and for the comparative failure of the subsequent efforts to maintain Latin principalities in Syria.

(2) Name some of the more important towns in Italy during your period and show in what the importance consists.

(3) Trace the history of the reign of either Frederic Barbarossa or Frederic II.

(4) What do you know of the history of the Eastern Empire during your period?

(5) State precisely the questions at issue in the War of Investitures. Sum up the results of the struggle.

(6) Give some account of the various religious orders founded during your period.

(7) Point out some of the most characteristic features of French institutions during the fourteenth century.

(8) Indicate some of the most important differences between the political map of Europe in 1254 and to-day.

Geography.

(1) On an outline map of the Balkan Peninsula draw carefully the Lower Danube and the Maritza river basins; indicate the general course of the water-parting between the Adriatic and Aegean Seas; mark the boundaries of the various states, and show the position of:—Adrianople, Bucharest, Orsova, Athens, Cetinje, Salonica, Gallipoli, Zante, Chios.

(2) On an outline map of North America fill in the following:—The names of six lakes; the islands of Cuba and Jamaica; the rivers Missouri, Mississippi, and Arkansas; the towns of Boston, Chicago, Savannah, and San Francisco. Trace the boundary line between Canada and the United States. Number the meridians of longitude and the parallels of latitude.

(3) Give an account of the principal ocean currents, stating their causes of origin, and briefly referring to effects produced by them on climate. Illustrate your answer by means of a map, distinguishing between the warm currents and the cold ones.

(4) Write down the names, and give accurately the situation, of the Australian Colonies; state their principal productions and characteristics of soil and climate.

(5) How do you account for the great density of population in England and China, and for its scantiness in Northern Africa, the basin of Mesopotamia and Arabia?

(6) Where are the following places? Explain how their importance is associated with their geographical position:—Berlin, Constantinople, Lowell, Chicago, Marseilles, Quetta.

(7) What should be the climate, physical features, and state of population of a district to render it suitable for the supply of tea, furs, rice and wool respectively? Illustrate your answers by references to countries producing these commodities.

(8) Write a general description of the mountain system of Asia.

(9) Compare the natural products of Germany and Australia, and show how the climate controls their effective development in each case.

French.

I.

(1) Distinguish between *la vieille, la veille, and la vielle*; *les cheveux and les poils*; *a courtier and un courtier*; *to hiss and hisser*.

(2) Give the present and past participles and third singular present indicative of *résoudre, croître, hair, and bouillir*; the second person plural present indicative of *redire, maudire, and médire*; the third singular past definite of *exercer, hair, mouvoir, mourir, moudre*.

(3) Give instances of adjectives employed instead of adverbs to modify certain verbs.

(4) Compose French sentences (which must be translated) to illustrate the uses and constructions of *autant, quoique, quoi que, quelque, quel que*, and *jusqu'à ce que*.

II. Translate into English:—

LA GRÈVE DES FORGERONS.

Mon histoire, messieurs les juges, sera brève. Voilà. Les forgerons s'étaient tous mis en grève. C'était leur droit. L'hiver était très dur; enfin cette fois, le faubourg était las d'avoir faim. Le samedi, le soir de paiement de semaine, on me prend doucement par le bras, on m'emmène au cabaret; et là, les plus vieux compagnons — J'ai déjà refusé de vous livrer leurs noms — Me disent: "Père Jean, nous manquons de courage; Qu'on augmente la paye, ou sinon, plus d'ouvrage, On nous exploite, et c'est notre unique moyen. Donc, nous vous choisissons, comme étant le doyen, Pour aller prévenir le patron, sans colère, Que, s'il n'augmente pas notre pauvre salaire, Dès demain, tous les jours sont autant de lundis. Père Jean, êtes-vous notre homme?" Moi, je dis: "Je veux bien, puisque c'est utile aux camarades." Mon président, je n'ai pas fait de barricades; Je suis un vieux paisible, et me méfie un peu Des habits noirs pour qui l'on fait le coup de feu.

FRANÇOIS COPPÉE.

LE THÉÂTRE AU XVI^e SIÈCLE.

Les rideaux se séparèrent lentement et laissèrent voir une décoration représentant une place publique, lieu vague, commode aux intrigues et aux rencontres de la comédie primitive. C'était un carrefour avec des maisons aux pignons pointus, aux étages en saillie, aux petites fenêtres maillées de plomb, de cheminées d'où s'échappait naïvement un tirebouchon de fumée allant rejoindre les nuages d'un ciel auquel un coup de balai n'avait pu rendre toute sa limpidité première. L'une de ces maisons, formant l'angle de deux rues qui tâchaient de s'enfoncer dans la toile par un effort désespéré de perspective, possédait une porte et une fenêtre praticables. Les deux coulisses qui rejoignaient à leur sommet une bande d'air çà et là géographié d'huile, jouissaient du même avantage, et de plus, l'une d'elles avait un balcon où l'on pouvait monter au moyen d'une échelle invisible pour le spectateur, arrangement propice aux conversations, escalades et enlèvements à l'espagnole.

TH. GAUTIER.

III. Translate into French:—

On the field of Chalgrove he came up with Rupert. A fierce skirmish ensued. In the first charge Hampden was struck in the shoulder by two bullets, which broke the bone and lodged in his body. The troops of the Parliament lost heart and gave way. Rupert, after pursuing them for a short time, hastened to cross the bridge, and made his retreat unmolested to Oxford. Hampden, with his head drooping and his hands leaning on his horse's neck, moved feebly out of the battle. The mansion, which had been inhabited by his father-in-law, and from which in his youth he had carried home his bride, was in sight.

IV. Translate idiomatically:—

La force prime le droit; à chacun son goût; faute de grives on mange des merles; revenons à nos moutons; ce que c'est que la vie.

Euclid.

(1) Prove that if one side of a triangle is produced the exterior angle is equal to the sum of the two interior and opposite angles.

The three angles of a triangle are equal to two right angles.

(2) Divide a straight line into two parts so that the square on one part is equal to the rectangle contained by the whole line and the other part.

(3) The square on the tangent OT from any point O to a circle is equal to the rectangle contained by the segments OP and OQ of any chord OPQ drawn through the point to cut the circle in P and Q.

(4) Describe a circle about a given equilateral and equiangular pentagon.

(5) State and criticise Euclid's axiom as to parallels, and prove the proposition in which Euclid uses this axiom by some method different from Euclid's.

(6) If the angles of one triangle are severally equal to those of another triangle, the sides of the former are proportional to the sides of the latter.

(7) Similar triangles are to one another in the duplicate ratio of their homologous sides.

(8) If two intersecting planes are both at right angles to a third plane, their common section is at right angles to the same plane.

(9) If one of the acute angles of a right-angled isosceles triangle be bisected, the opposite side will be divided by the bisecting line into two parts such that the square on one will be double of the square on the other.

(10) The common chord of two circles is produced to any point P; PA touches one of the circles in A; PBC is any chord of the other: shew that the circle which passes through A, B, C touches the circle to which PA is a tangent.

(11) If the circle inscribed in a triangle ABC touch the sides AB, BC in the points D, E, and a straight line be drawn from A to the centre of the circle, meeting the circumference in G, shew that G is the centre of the circle inscribed in the triangle ADE.

(12) A and B are fixed points, and AC, BD are perpendiculars on CD, a given straight line: the straight lines AD, BC, intersect in E, and EF is drawn perpendicular to CD. Shew that EF bisects the angle AFB.

(13) If P be a point in a plane which meets the containing edges of a solid angle in A, B, C and O be the angular point, shew that the angles POA, POB, POC are together greater than half the angles AOB, BOC, COA, together.

Algebra.

PASS PAPER.

(1) Find the value of

$$+ \sqrt{x^2 + y^2 + z^2} - \frac{\frac{1}{2}(x+y)(y-z)}{z-x} + \frac{xyz}{3}(x+y)^{\frac{1}{3}}$$

when $x=2, y=-1, z=-2$.

(2) Find the G.C.M. of $x^4 - 3x^3 - 3x - 1$ and $x^6 + 1$, and the L.C.M. of $x^3 + x^2 + x + 1, (x^2 + x)^2, x^4 - 1, x^6 - x^4$.

(3) (i.) Simplify:—

$$\frac{1}{x-y} - \frac{1}{x+y} - \frac{2x-y}{x^2-xy+y^2} + \frac{2x+y}{x^2+xy+y^2}$$

(ii.) Show that if $x+y+z+w=0$, then

$$x^3+y^3+z^3+w^3 = 3xyzw \left(\frac{1}{x} + \frac{1}{y} + \frac{1}{z} + \frac{1}{w} \right)$$

(4) Solve the equations:—

(i.) $\frac{5x-1}{4} - \frac{6x-1}{5} - \frac{4x-1}{6} = 0$.

(ii.) $\frac{p}{x+q} + \frac{q}{x+p} = \frac{p+q}{x}$ (iii.) $\frac{13x-42y=1}{22y-27x=2}$

(5) A man bought 100 pigs and sheep, the pigs at £2 each and the sheep at £3 each. If he gave £220 for the lot, how many of each did he buy?

(6) Prove that $x^m \times x^n = x^{m+n}$ where m and n are positive integers. From this deduce the value of $\frac{x^m}{x^n}$, and give a meaning to the expressions $x^{\frac{1}{2}}, x^0, x^{-1}$.

Find the value of

$$\frac{(27a^2b^2c)^{\frac{1}{3}} \times (216ab^2c^2)^{\frac{1}{3}}}{(6abc)^{\frac{1}{3}}}$$

(7) Find the sum of the roots of the equation $ax^2+bx+c=0$. Solve

(i.) $\frac{1}{x+1} + \frac{2}{x+2} = \frac{8}{15}$ (ii.) $\sqrt{x+2} - \sqrt{x-3} = \sqrt{x-6}$.

(8) Find the square root of $79+20\sqrt{3}$.

(9) If a varies jointly as b and c and b varies as the square of c , and if, when $a=1, b=2$ and $c=3$, find b and c when $a=7$.

(10) Find the value of

(i.) $(x^l+x^{-l}) \times (x^{\frac{1}{2}}+x^{-\frac{1}{2}})$

(ii.) $\frac{\sqrt[3]{2a^{-2}b^3 \times (ab^{-2})^{-\frac{1}{3}}}}{(a^{-2}b^{-1})^{-\frac{1}{3}}}$

(11) A box of oranges is divided equally among a certain

number of children. If there had been 20 fewer children each child would have had 3 oranges more, and if there had been 20 more children each would have had 2 oranges less. Find the number of children and the number of oranges distributed.

Answers.—

- (1) $4\frac{1}{2}$. (2) G.C.M. $x^2 + 1$; L.C.M. $x^2(x+1)^2(x^2+1)(x-1)$.
 (3) (i.) $\frac{6x^2y^2}{x^2 - y^2}$; (4) (i.) $\frac{7}{37}$; (ii.) $-\frac{p+q}{2}$; (iii.) $x = -\frac{1}{2}$, $y = -\frac{1}{8}$.
 (5) 80 pigs, 20 sheep. (6) $3\sqrt{2a^2b^2c^2}$. (7) $-\frac{b}{a}$, (i.) $-\frac{11}{8}$ or 4.
 (ii.) 7 or $-\frac{7}{3}$. (8) $2 + 5\sqrt{3}$. (9) $b = 2\sqrt[3]{49}$, $c = 3\sqrt[3]{7}$.
 (10) (i.) $x^{l+\frac{1}{2}} + x^{-(l+\frac{1}{2})} + x^{l-\frac{1}{2}} + x^{-(l-\frac{1}{2})}$; (ii.) $\frac{2^{\frac{1}{2}}}{a^{\frac{1}{2}} b^{\frac{1}{2}}}$.
 (11) 100 children, 1200 oranges.

JUNIOR OXFORD LOCAL EXAMINATION, JULY, 1902.

Revision Test Papers.

Arithmetic.

PASS PAPER.

- (1) A goods train of 24 trucks weighs $351\frac{3}{4}$ tons; find the average weight of each truck.
 (2) Simplify:—
 (a) $\frac{2}{3} - \frac{4}{9}$ of $\frac{1}{5} + \frac{1}{3}$; (b) $\cdot 875 \times \cdot 016$.
 (3) Explain how the same digit may have different values according to its place in a number.
 (4) Find the total contents of 865 sacks, each containing 5 quarters, 7 bushels, 2 pecks.
 (5) Find the value of $\pounds 16'43125$, and express $\frac{3}{4}$ of a square yard as a fraction of $\frac{1}{4}$ of an acre.
 (6) If $3\frac{1}{2}$ cwt. of coal cost 5s. $1\frac{1}{2}$ d., what is the price of 11 tons, 4 cwt.?
 (7) State and prove the rule for the reduction of recurring decimals to vulgar fractions.
 Reduce to vulgar fractions $2\cdot 07\bar{5}$, $2\cdot 0\bar{7}5$ and $2\cdot 07\bar{5}$.
 (8) To reap 210 acres of corn 20 men are employed for 10 days, working 14 hours a day. How many acres will 27 men reap in 15 days, working 12 hours a day?
 (9) What would be the cost of painting an open zinc cistern, inside and outside, at 6d. per square yard, the dimensions being 7 ft. 6 in. long, 6 ft. 3 in. high, and 27 inches wide?
 (10) A man runs 200 yards while a clock is striking twelve. If his speed is 10 miles an hour what is the interval between the successive strokes of the clock's bell?
 (11) Find, by practice, to the nearest penny the difference between the price of 3 quarters, 4 bushels, 2 pecks of wheat in 1800 and 1830, the prices in those years being $\pounds 5$ 13s. 10d. and $\pounds 3$ 4s. 3d. per quarter respectively.
 (12) Find the simple interest on $\pounds 2,375$ for $2\frac{1}{2}$ years at $3\frac{1}{2}$ per cent. In what time would the simple interest be the same at 3 per cent.?

- Answers.—(1) 14 tons 13 cwt. 14 lbs. (2) (a) $\frac{1}{15}$; (b) $\cdot 014$.
 (4) 5,135 qrs. 7 bush. 2 pks. (5) 16 8s. $7\frac{1}{2}$ d.; $18\frac{1}{15}$.
 (6) $\pounds 16$ 6s. 8d. (7) $2\frac{2}{3}$, $2\frac{2}{3}$, $2\frac{1}{3}$. (8) $364\frac{1}{2}$ acres. (9) 15s. 5d.
 (10) $3\frac{1}{11}$ secs. (11) $\pounds 8$ 16s. 8d. (12) $\pounds 192$ 19s. $4\frac{1}{2}$ d.; 2 years $8\frac{1}{2}$ months.

English Grammar.

- (1) Parse the words in italics in the following passage:—
 I watch him *as* he skims *along*,
Uttering his sweet and mournful cry.
 He *starts* not at my fitful song,
Or flash of *fluttering* drapery.
 He has *no* thought of any *wrong*,
 He scans me with a fearless eye;
 Staunch *friends* are we, *well* tried and strong,
 The little sandpiper and I.
- (2) Analyse:—
 In order to banish an evil out of the world, that only produces great uneasiness to private persons, but has also a very

bad influence on the public, I shall endeavour to show the folly of demurring, from two or three reflections, which I earnestly recommend to the thoughts of my readers.

(3) What are the functions of a relative pronoun? What are the differences between *who* and *that* as relative pronouns?

- (4) Correct, where necessary, the following sentences:—
 (a) Why are these sort of men allowed to live?
 (b) Here is the soldier whom I believe was the traitor.
 (c) He said that he is going to work like I do.
 (d) Each boy in the two rooms sprang to their feet.
 (5) Distinguish between strong and weak verbs. Give the 1st person singular, past tense, and the imperfect participle of:—*Cringe, soothe, singe, run, abet, prefer, tell, toll, offer, lie, work, weave*.
 (6) Explain the meaning of each of these sentences:—
 (a) His idiosyncrasy is offensive.
 (b) He spoke with acerbity, though with a considerable degree of diffidence.
 (c) He was the product of his environment.
 (d) Yours was a policy of masterly inactivity.
 (7) Make sentences exemplifying the use of:—
 (a) A verb of incomplete predication.
 (b) An adverb modifying a phrase.
 (c) An adjective used predicatively.
 (d) An infinitive dependent on another verb.
 (e) A possessive case in apposition.
 (8) Paraphrase:—
 O, hearts that break, and give no sign
 Save whitening lip and fading tresses,
 Till death pours out his cordial wine,
 Slow—dropped from Misery's crushing presses,—
 If singing breath or echoing chord
 To every hidden pang were given,
 What endless melodies were poured,
 As sad as earth, as sweet as Heaven?

English History, 1066-1399.

- (1) In what way did William the Conqueror seek to extend and secure his hold on England after the battle of Hastings?
 (2) Why was life in England less comfortable under Stephen than under his predecessor and successor?
 (3) Make lists of the dominions of the Kings of England (a) in 1160, (b) in 1260, (c) in 1360. Account for any notable differences in these lists.
 (4) On what grounds and with what results did (a) Edward I. invade Scotland, and (b) Edward III. invade France?
 (5) For what purposes did Parliament come into existence? Of what elements was the Model Parliament of 1295 composed?
 (6) What were the precise issues at stake in the quarrels (a) between Henry III. and his Barons, (b) between Edward II. and the Lords Ordainers, (c) between Richard II. and the Lords Appellant?
 (7) What do you know about the relations between England and Ireland throughout your period?

European History, 1095-1254.

(Not more than six Questions to be attempted. Introduce references to English history whenever possible.)

- (1) Tell the story of either (a) the First Crusade, or (b) the Third Crusade. What differences do you notice between them?
 (2) Write a life of Bernard of Clairvaux.
 (3) Give an account of the rise of the orders of Friars. How did friars differ from monks?
 (4) Who was Henry the Lion? Show his importance in German history and point out his connexion with England.
 (5) What events during your period do you associate with the names of Arnold of Brescia, Bouvines, Canossa, Constance, Eleanor of Aquitaine, and Suger?
 (6) Show the importance of the reign of Philip Augustus in French history.
 (7) Who were the Albigenses, the Almohades, and the Templars, and why were they important?
 (8) Tell the story of the struggle between Frederic Barbarossa and the Italian cities.

Geography.

- (1) On an outline map of Scotland mark and name: (1) the capital; (2) the largest town; (3) the largest river basin; (4) the chief coal district; (5) the chief ports. Shade the highlands and name them.
- (2) On an outline map of Australia insert:—Great Victoria Desert, McDonnell Range, Blue Mountains, Great Barrier Reef, Lake Eyre, Freemantle, Hobart, Sydney, Adelaide. Mark the course of the Tropic of Capricorn.
- (3) Explain these facts:—
 - (a) There are no large towns on the banks of the Murray.
 - (b) A great part of Australia is desert.
 - (c) The west coast of Scotland has the greatest rainfall.
 - (d) The western boundary of Germany is an artificial one.
- (4) Account for the importance of the following:—Carse o' Gowrie, Berlin, Glasgow, Leipzig, Strashurg, Ballarat. What time is it at Melbourne when it is noon at Greenwich?
- (5) (a) What regions are noted for the production of rice, platinum, teak, coffee, rubber?
 (b) Name some places in the British Isles where shipbuilding is carried on, and account for the *locale* of this industry in each case.
- (6) (a) Explain and illustrate these terms:—Tundra, llano, volcano, monsoon.
 (b) Give reasons for:—
 - (i.) The great rainfall over the Congo basin.
 - (ii.) The direction of the prevalent winds in England.
 - (iii.) The low average temperature of Patagonia.
 - (iv.) The dry climate of Spain.
 - (v.) The overflowing of the Nile.
- (7) Where exactly are:—The Hindu Kush Mountains, Palk Strait, Crete, Lake Onega, the Glommen, Quito, Gobi Desert?
- (8) In what ways is it possible to journey from England to Australia?
 Describe a journey by *one* route, naming the chief places called at, the variations in climate and the probable length of the journey.
- (9) Name the African possessions of each of the great European Powers.

French.

- I.
 - (1) Give the singular of *les sous nouveaux, des hommes jaloux*; the plural of *madame la comtesse*; the feminine of *jumeau, dévot*.
 - (2) Give the two superlatives of *peu*; and give examples of three adjectives that differ in meaning according to their position before or after a noun.
 - (3) Differentiate: *actual* and *actuel*, *gentleman* and *gentil-homme*, *un thème* and *une version*.
 - (4) Give the present subjunctive in full of *pouvoir* and *vouloir*, the imperative of *savoir*, and the present infinitive of *crâ*, *lu*, and *parvenu*.
 - (5) Give all the simple tenses of *il faut*, and the past definite interrogatively of *s'apercevoir*.
 - (6) Show, by examples, the difference between *l'un l'autre*, *l'un et l'autre*, and *l'un ou l'autre*.
- II. Translate into English:—

Le rendez-vous était pour six heures, mais notre impatience l'avait si bien devancé qu'il en était à peine quatre quand nous arrivâmes à Saint-Germain. Notre regret fut vif de ne pas nous être montrés plus pressés encore, car à l'instant même où nous débouchions sur la place de la station, nous fûmes voir disparaître vers le haut de la rue adjacente la queue d'une longue colonne. En même temps les accents lointains d'une musique militaire arrivaient à nos oreilles. Un bourgeois bienveillant eut l'obligeance de nous apprendre qu'une grande revue de pompiers venait d'avoir lieu.
- III. Translate into French:—
 - (1) Where is your little brother? He is at school.
 - (2) You were speaking of the war, were you not?
 - (3) We have lived in Brussels for the past three years.
 - (4) Every time that Frederick the Great met a physician, he asked him how many persons he had sent to the other world. One of them replied to him one day: "Not so many as you have, your Majesty." Frederick turned his back on him and never spoke to him again.
 - (5) To kill two birds with one stone.

Euclid.

PASS PAPER.

- (1) What is meant by (1) a plane angle, (2) a plane rectilinear angle, (3) a quadrilateral? Name four different kinds of quadrilaterals.
 State two of Euclid's axioms.
- (2) From a given point X to draw a straight line equal to a given straight line YZ.
- (3) If from the ends of the side of a triangle FGH there be drawn two straight lines to a point K within the triangle, these shall be less than the other two sides of the triangle, but shall contain a greater angle.
- (4) If the side of any triangle be produced, the exterior angle is equal to the two interior and opposite angles; and the three interior angles are together equal to two right angles.
- (5) Show how to describe a parallelogram which shall be equal to a given triangle LMN, and have one of its angles equal to a given rectilinear angle P.
- (6) If a straight line PQ be divided at any point R, show that the square on PQ is equal to the sum of the squares on PR, RQ, together with twice the rectangle contained by PR and RQ.
- (7) Prove that the diagonals of a parallelogram bisect one another.
- (8) Within a given angle BAC take any point D, and show how to draw a line through D to meet AB in E and AC in F, so that ED may be equal to DF.
- (9) The base BC of the triangle ABC is bisected at D. Through B a straight line is drawn cutting AC in E and a line drawn through A parallel to BC in F. Show that the triangle ADE is equal to the triangle EDF.
- (10) ZXY is a right-angled triangle having a right angle at X. From X is drawn a line XO cutting ZY in O so that the angle ZOX is equal to the angle XZY, and XV is drawn perpendicular to ZY cutting ZY in V. Show that the square on XV is equal to the difference of the squares on OY and OV.

Algebra.

PASS PAPER.

- (1) What do you understand by the expressions "factor or a number" and "power of a number"? Write a number of which 3 is a factor, and also a number which is a power of 3.
- (2) (i.) Add together: $c - \{d + e - (c + d)\} + e, 2(3c + 2d) - 4(d + 2c) - e, \text{ and } 3(2d - c) - 2(3d - c) + e.$
 (ii.) Subtract $c - (d - e)$ from the sum obtained in the first part of the question.
- (3) Divide $3x^3 + 16x^2 - 33x + 14$ by $x^2 + 7$.
- (4) If a certain set of numbers were resolved into factors, how would you proceed to write down (i.) the G.C.M. and (ii.) the L.C.M. Perform the processes on the following quantities: $3x(x - y)^2, 2 \cdot 3^2 x^2(x + y)^2, 3 \cdot 2^2 x(x - y)^2(x + y)^2.$
- (5) Resolve into factors: (i.) $a^2 - 7ab - 12b^2$; (ii.) $6m^2 - 5mn - 6n^2.$
- (6) A man reads b books of p pages each in w weeks, reading h hours per day. How many pages does he read per hour?
- (7) Find the G.C.M. of $3a^2 - 16a^2 - 12a$ and $2a^2 - 11a^2 - 3a - 18$; and the L.C.M. of $x^2 - y^2, 2x^2 - xy - y^2, x^2 + 2xy + y^2.$
- (8) Simplify:—
 - (i.) $\frac{1}{6(1+a)} + \frac{1}{6(1-a)} + \frac{1}{3(1+a^2)}$;
 - (ii.) $\left(\frac{1}{l+p} + \frac{p}{l-p}\right) \div \left(\frac{1}{l-p} - \frac{p}{l+p}\right)$;
 - (iii.) $1 - \frac{1}{1 - \frac{1}{x}}$.
- (9) Find the square root of: $x^4 + 1 + 14x(x^2 - 1) + 47x^2.$
- (10) Solve the equations:—
 - (i.) $\frac{x-7}{3} + \frac{x+1}{2} = \frac{2x+1}{6}$;
 - (ii.) $3x - 5y = 1, 2x + 17y = 82.$
 - (iii.) $\frac{3x-y}{4} = 2x + y = \frac{3(x+y)+6}{6}$.
- (11) The total capital subscribed by the three partners of a firm is £2,500. One subscribed twice as much as the second

and £250 more than the third. How much did each partner subscribe?

Answers.—

- (2) (i.) $-c$, (ii.) $-2c+d-e$. (3) $3l^2-5l^2+2l$. (4) G.C.M. $3x$.
L.C.M. $144x^2(x-y)^2(x+y)^2$. (5) (i.) $(a-15b)(a+8b)$;
(ii.) $(3m+2n)(2m-3n)$. (6) $\frac{bp}{7wh}$. (7) G.C.M. $a-6$;
L.C.M. $(x+y)^2(x-y)(2x+y)$.
(8) (i.) $\frac{2}{3(1-a^4)}$; (ii.) 1; (iii.) x . (9) x^2+7x-1 . (10) (i.) 13;
(ii.) $x=7, y=4$; (iii.) $x=1, y=-1$. (11) £1100, £550, £850.

PRELIMINARY OXFORD LOCAL EXAMINATION, JULY, 1902.

Revision Test Papers.

Arithmetic.

- (1) Add five millions and sixty to three thousand and three and subtract eighty thousand eight hundred from the result. Express the answer in words.
(2) How many people can receive eight guineas each from a sum of £1,000, and how much will be left undistributed?
(3) Divide 4 acres, 2 roods, 17 poles, 8 yards, by 64, and express the remainder in inches.
(4) A man has a five-pound note, a sovereign, a five-shilling piece, and a sixpenny piece. He gives away $\frac{2}{3}$ of the note, $\frac{1}{2}$ of the sovereign, $\frac{1}{4}$ of the five-shilling piece, and $\frac{1}{8}$ of the sixpenny piece. How much has he left?
(5) Simplify $\frac{4}{10}$ of $\frac{1}{4}$ - $\frac{1}{4}$ of $\frac{1}{3}$.
(6) Multiply 7'80069 by 56'037.
(7) What decimal is $1\frac{1}{4}$ inches of a yard?
(8) Find by practice the year's takings of a grocery business which is open on 308 days, the average daily takings being £20 18s. 4½d.
(9) When eggs are fifteen pence a dozen, what is the price of a score, and how many would you get for 1s. 8d.
(10) A man met a friend on January 1st, 1901, and borrowed a five-pound note. He paid him back the next time he met him, viz., on the 15th March, 1902. How much interest ought he to have paid him at 5 per cent. per annum?

Answers.

- (1) Four millions, nine hundred and twenty-two thousand two hundred and sixty-three. (2) 119; 8 shillings. (3) 11 poles, 15 sq. yds., 6 sq. feet, 72 sq. inches, and 36 inches over.
(4) £2 1s. 8½d. (5) 51. (6) 437'12726553. (7) '03125.
(8) £6,442 19s. 6d. (9) 2s. 1d.; 16. (10) 6s.

English History, 1086-1399.

- (1) Write a life of either (a) Anselm, or (b) St. Thomas of Canterbury.
(2) Tell the story of the Third Crusade.
(3) When, where, and with what results did the battles of Bannockburn, Bouvines, Cressy, Falkirk, and Tenchebrai take place?
(4) With what objects and with what consequences did Edward intervene in the affairs of Scotland?
(5) On what grounds did Henry III., Edward II., and Richard II. respectively become unpopular?
(6) State briefly the circumstances and importance of *Domesday Book*, *Magna Carta*, and the *Treaty of Bretigny*.

English Grammar.

- (1) Parse fully the words in italics in the following passage:—
The *rain* and the night *together*
Came down, and the wind *came* after,
Bending the props of the *pine-tree* roof,
And snapping *many* a rafter.
(2) Give illustrations of:—
(a) A pronoun joining two sentences.
(b) An adjective used as a noun.
(c) An irregular transitive verb.
(d) An infinitive mood as the object of a sentence. Each by a separate sentence.

(3) What are the rules for forming the comparative and superlative degrees of adjectives?

What other part of speech may be inflected for comparison?

(4) Decline the following words:—*Woman, hero, I, who*.

(5) What parts of speech may the following be:—*That, round, since*? Give instances.

(6) Give in your own words the meaning of the following passage:—

Whichever way the wind doth blow,
Some heart is glad to have it so;
And blow it east or blow it west,
The wind that blows, that wind is best.
My little bark sails not alone,
A thousand fleets from every zone
Are out upon a thousand seas;
And what to me were favouring breeze
Might dash some other with the shock
Of doom upon some hidden rock.

Geography.

(1) On the outline map of North America insert New York, Quebec, San Francisco, New Orleans, Chicago. Trace the course of the Mississippi-Missouri, the St. Lawrence and its lakes, and shade the highest land of the continent. Draw an arrow pointing in the direction you would take in going from New York to Liverpool.

(2) In what parts of Scotland are iron and coal found? What towns or districts are engaged in ship-building, paper-making, brewing?

(3) Draw a map of the Rhine basin, inserting the chief tributaries and the position of Strasburg, Cologne, Mannheim? Name and account for the chief occupations of the inhabitants of Germany.

(4) How would you arrange a globe so that you could see at one glance (a) the greatest extent of water, (b) the greatest extent of land.

Point out some respects in which the Pacific and Atlantic Oceans differ.

(5) Explain these terms:—*Plateau, delta, water-parting*, and give examples of each.

What do you know about the Trade Winds?

(6) Name the countries from which England receives wheat, coffee, indiarubber, rice, diamonds, and timber.

French.

I.

(1) Give the singular of *fil*, *cailloux*, *vitraux*, *yeux*, *nez*; the masculine of *reine*, *favorite*, *polie*, *trompeuse*, *vieille*.

(2) Write in full the present subjunctive of *avoir* and *être*; the present indicative of *saisir* and *devoir*; and the past definite of *parler*.

(3) Give the French of:—Which of these flowers do you prefer? Boys must work; Have you any friends in the town? Give me half a cup of coffee; George the Second was the son of George the First; How many books have you? The news has arrived; He is looking for his pen.

II. Translate into English:—

Un paysan portait un jour une corbeille de poires dans un grand château. A la porte il trouva deux singes qui étaient vêtus comme des enfants. Ces animaux se jetèrent sur la corbeille du paysan, qui ôta respectueusement son chapeau, et se laissa prendre la plus grande partie de ses poires. Le maître du château, voyant la corbeille presque vide, demanda au paysan: "Pourquoi n'as-tu pas rempli la corbeille?" "Monsieur," répondit le bon paysan, "elle était bien pleine, mais messieurs vos fils ont trouvé les poires de leur goût, et je n'ai pas eu le courage de les leur refuser."

III.

(1) What do you know of the conjugation of *jeter*? Give the present and past participles of *prendre*.

(2) What is the gender of *pleine*, and with what noun does it agree?

(3) What is the feminine of *leur*? Is *leur* always an adjective? If not, what else may it be?

(4) Parse "je n'ai pas eu le courage."

(5) Give the present infinitive of *vêtus* and *voyant*.

Euclid.

(1) Define the terms straight line, angle, circle, scalene triangle and rhombus.

(2) In a triangle XYZ, the side XY is equal to the side XZ; prove that the angle XZY is equal to the angle XYZ.

(3) At a point P in the straight line OPQ draw a line perpendicular to OPQ.

(4) Make a triangle the sides of which are equal to three given straight lines.

Will any straight lines do? If not, in what way is the choice of straight lines limited?

(5) If a straight line fall upon two parallel straight lines, it makes the two interior angles on the same side together equal to two right angles, and also the alternate angles equal to one another, and also the exterior angle equal to the interior and opposite angle on the same side of the straight line.

(6) Describe a parallelogram that shall be equal to a given triangle and have one of its angles equal to a given angle.

(7) LM and NP are straight lines bisecting one another at right angles; show that LNMP is a square.

Algebra.

(1) Add together

$$x - (y + z), 2x - (y - z), z - (2y + x), y + (3z - x).$$

(2) Divide

$$2x^3 + 15x^2 + 50x + 90x^2 + 85x + 33 \text{ by } 2x + 3.$$

(3) If $l = 1, m = 2, n = -3$ and $p = 0$, find the value of the expression:—

$$\frac{l^2 - 2lm + 3ln - lmp}{4l(m - n) + 3p^2}$$

(4) Find the L.C.M. of $p^2q^2r, 3pq^2r^2s, 12qrst$ and $18r^2s^2t^3$; find also the G.C.M. of $x^3 + 7x^2 - 8x - 20$ and $x^4 + 6x^2 - 40$.

(5) Simplify the expression:—

$$\frac{x-1}{x-2} - \frac{x-3}{x+2} + \frac{1}{x^2-4}$$

Divide $\frac{1}{x^4 - y^4}$ by $\frac{1}{x + y}$.

(6) Solve the equations:—

$$(a) \frac{4x-1}{3} - \frac{2(x-2)}{5} = x.$$

$$(b) \frac{lx-m}{n} + \frac{nx-m}{l} = 0.$$

(7) A bill of 32s. 6d. is paid with florins and half-crowns, the number of florins used being twice the number of half-crowns. How many of each kind of coin were used?

(8) If p pigs are worth r sheep, and s sheep are worth t goats, how many goats are l pigs worth?

Answers.

- (1) $x - 3y + 4z$. (2) $x^4 + 6x^3 + 16x^2 + 21x + 11$. (3) $-\frac{3}{2}$.
 (4) $36p^2q^2r^2s^2t^3, x - 2$. (5) $\frac{6x-7}{x^2-4}, \frac{1}{(x-y)(x^2+y^2)}$. (6) (a) 7,
 (b) $\frac{n(l+n)}{l^2+n^2}$. (7) 5 half-crowns, 10 florins. (8) $\frac{lr^t}{ps}$.

RECENT SCHOOL BOOKS AND APPARATUS.

Modern Languages.

Blackie's Little French Classics. (1) *Bossuet, Oraisons funèbres.* Selections edited by Rev. H. J. Chaytor, M.A. 32 pp. (2) *Brueys and Palaprat, L'Avocat Patelin.* Edited by E. B. le François. 40 pp. (3) *Th. Gautier, Le Pavillon sur l'Eau.* Edited by W. G. Hartog. 32 pp. (Blackie.) 4d. each.—These fresh additions to a handy little series are of unequal value. The first is distinctly useful: three of the famous speeches are given, if not in full, yet at sufficient length to convey an idea of Bossuet's eloquence. The partially modernised "Avocat Patelin" hardly deserved re-editing; a reprint of the little drama in its original form would have been more welcome. The two stories in the third volume, "Le Pavillon

sur l'Eau," and "Le Nid de Rossignols" are not happily chosen; selections from Gautier's books of travel would have made a much more acceptable booklet. In each case there is a short biography of the author, and a few pages of adequate notes are added.

Grands Prosateurs du dix-septième Siècle. Edited by Louis Brandin. xx.+162+1. pp. (Black.) 2s. 6d.—This is a very careful selection from the works of Pascal, Mme. de Sévigné, La Rochefoucauld, Bossuet, La Bruyère, Fénelon, and Descartes, with a full apparatus of critical and biographical commentary. It may be regretted that so few pages have been given to this author or to that, but there was the obvious danger of making the book unwieldy and frightening away the young student. As it is, it will be taken up by many with profit, for they can hardly peruse it without gaining a clearer idea of a period in French literature which presents so much that is difficult to the foreigner. A number of illustrations have been added which render the book still more attractive. It can be obtained without notes, but these are worth a great deal more than the extra sixpence.

Marivaux. A Selection from the Comedies of. Edited by E. W. Olmsted, Ph.D. xc.+316 pp. (Macmillan.) 5s.—This book will appeal to the university student and the lover of literature rather than to the schoolmaster *qua* schoolmaster. Professor Olmsted has made a good choice from among the delightful comedies of the eighteenth-century dramatist, and has given an interesting picture of his life and personality. The book is excellently "gotten up," as they say in the land of its origin. To those who do not yet know Marivaux, we recommend the book warmly.

Scribe, Le Verre d'Eau. Edited by C. A. Eggert, Ph.D. x.+138 pp. (Heath.) 1s. 3d.—Another edition of this well-known and over-estimated play; we cannot agree with the rather extravagant terms in which the editor speaks of it in his introduction. The text is well printed; the notes are commendably brief, the renderings being generally satisfactory. We cannot, however, say that we like such English as "to cap the climax of my bad luck" or "the snap-finger man."

Theodor Storm, Immensee. Edited by R. A. von Minckwitz and A. C. Wilder, B.A. xi.+88 pp. (Ginn.) 2s.—There is already at least one English edition of this fine short story, and it can hardly be maintained that this edition is in any sense an improvement. Herr von Minckwitz's introduction is a flagrant specimen of what it should not be, a painful mingling of pathos and bathos. Two sentences will suffice: "In the struggle with the elements he has learned to maintain his outward composure, his strength has grown, fear he does not know, sentiment and passion are locked up, as it were (is this 'as it were,' not *unbezahlabar*?), in an impervious shell. Yet as lightning cleaving the clouds betrays the sky beyond, there are times when he shows his innermost nature." A few pages of notes, of no particular interest, and a good vocabulary, complete the book, which might as well have been left unpublished.

A Smaller German Grammar. By Rev. A. L. Becker. 109 pp. (Hirschfeld.) 1s.—This is intended as a beginner's book on the lines of the "well-known and excellent" Hossfeld Method, as it is called in an introductory note. There is not much that distinguishes this method from many another book on the old familiar lines. The remarks on pronunciation are unsatisfactory, the *Lesübungen* are often stilted in language and uninteresting, the printing is not free from errors, the bad order, *Nom., Gen., Dat., Acc.*, is retained, and the disconnected sentence flourishes, as well as interlinear translation.

Classics.

Mr. George Carter's pamphlet, *Rules of Latin Syntax*, 23 pp. (Relfe Bros.), will be useful for revision in the hands of those who have done Latin syntax more fully, but is not sufficient in itself. It calls for no further remark.

We can speak favourably of Miss M. Alford's *Latin Passages for Translation*, xiii. + 250 pp. (Macmillan), 3s., "for the use of the higher forms in schools and of students working for pass degrees"; the special feature of which is the number of good models for Latin prose which it contains. Cicero, Cæsar, Livy, and Tacitus are the main sources; but there are also specimens of other prose writers and of verse. The passages are to some extent progressive in difficulty, and they are over a wide range of subjects. The standard is above that of a pass degree, but the book is none the worse for that.

The Old Senate and the New Monarchy; 60 B.C. to A.D. 14. By F. M. Ormiston. With Vocabulary. viii. + 117 pp. (Black's Historical Latin Readers.) 2s.—We have already noticed the earlier numbers of this useful series; the present one carries down the story to the death of Augustus. Its plan is the same as the others; and a special feature, as will be remembered, is the suggestion of historical parallels to each episode, and an indication of cause and effect in history. According to the general scheme, this volume is more difficult than its two predecessors. There are illustrations of Cæsar, Cicero, Pompey, Augustus, and objects mentioned in the text. It is a useful and sensible book.

Cæsar, Civil War, Book I. Edited by A. H. Allcroft. Text and Notes. 109 pp. (W. B. Clive.) 1s. 6d.—A short introduction, containing the usual historical preamble, is followed by the text, well printed, and the notes, which are too elementary and all-explaining to be good for school-boys; this may, however, commend it to the students who wish to pass the matriculation of the Cape University. Mr. Allcroft annotates *sibi* "for himself, on his own account"; *in eandem sententiam*, "to the same effect"; *ut*, "as for example," and similar trifles. Otherwise we have no criticism to offer; Mr. Allcroft is careful and correct.

Ovid, Tristia, Book I. By A. E. Roberts. xxxv. + 112 pp. (Bell's Illustrated Classics.).—A short account of Ovid's life and works, with a metrical note, forms the introduction. The text is broken up into snippets with English headings, and illustrated, the pictures being freely treated by the modern artist, as usual in this series. For instance, the chapel on p. 26 is "from Pompeii," but the female figure from York Street, Covent Garden; behind Orestes and the Furies (32) is a headland from the coast of Kent. The notes explain details like the construction of *puet*; yet while pointing out the quantity of *puet* (77) the editor says nothing of the reason, and for all that appears it might be a unique liberty. Something more is wanted, too, for *patiens laborum* (i. 5.61), than the explanation "objective genitive." The quotations from English poets are very welcome.

The Odyssey of Homer. I. By E. C. Everard Owen, M.A. xxxv. + 61 pp. (Blackie.) 2s.—This book also contains a good introduction, clearly summarising the Homeric question, especially good in its literary criticism. The notes, however, are not intelligent. If a sketch of the dialect is in place in such books, which we doubt, let it be a fairly complete sketch; here scraps of information are scattered about amongst the notes. Many of them are too elementary (e.g., on 158, 219 repeating another, 410). ἀμύμων (29) is not derived from μῶμος. The pictures are interesting.

A Parallel of Greek and Latin Syntax. By C. H. St. L. Russell. Parallel Grammar Series. xiv. + 223 pp. (Sonnen-schein).—The idea of this book is good; both learners and teachers find it useful to have Greek and Latin usages side by side, although they cannot profitably be taught together. And the teacher who uses this book may guard his pupils against many mistakes by calling their attention to the parallel column; for instance, in the uses of the moods in *oratio obliqua*, the dependent question, and so forth. But we have to state that this book must be used with caution. Mr. Russell is imperfectly equipped for writing a comparative grammar, in which a sound knowledge of origins is indispensable, even though little be said about them. His limitations are most marked in his treatment of such idioms as the historic infinitive, which he "explains" by understanding the word *begun*; if this were right, we should never find it used with such words as *interficio*, or others which imply a single act. In fact, it is a verbal-noun use of the same type as in "once more *unto the breach*," or "now *for eating*." The imperative-infinitive belongs to the same class (Mr. Russell understands *δότε*). There is a bad blunder on p. 39, where *ἔστιν* *of* is given as the Greek for *same*: it is well known that *εἰσὶν* *of* is the only phrase which occurs, *ἔστιν* being confined to the oblique cases. The conditions are classified on the principle of fulfilment or non-fulfilment, which itself depends upon the time. We have marked a number of details which we have no space for. In spite of its faults, however, the book judiciously used will be useful. It is a pity that the columns are not divided by a line; the page is confusing to the eye.

Edited Books.

A Short Introduction to the Literature of the Bible. By Professor R. G. Moulton. 374 pp. (Isbister.) 3s. 6d.—It is difficult to say too much in praise of this book. Professor Moulton is already well known for his services to biblical scholarship as editor of the "Modern Reader's Bible," and as author of a substantial work upon the "Literary Study of the Bible." To both of these productions this volume is intended to serve as a guide and a handbook, while it has further the advantage of following a plan of its own, and is not merely a condensed form of the larger work. It will probably take no short time before the value of the Bible as pure literature is at all recognised either by clergy or laity; it will therefore probably be longer still before it takes any prominent rank in ordinary education or exercises any influence upon the setting of examination tests. But if schoolmasters would take this book of Professor Moulton's to heart in every sense, and if the present current methods of teaching Scripture and preparing for Divinity tests could be leavened by some of the conclusions to which this volume irresistibly leads, and which it lucidly illustrates, a beginning might be made with the rising generation towards a rational understanding of Holy Writ destined to bear great fruit in time to come. It is perhaps hopeless to recommend it to the average candidate for Holy Orders; still more so perhaps in the case of the already fledged cleric whom no theological crudity can put to the blush; but for all patient, thoughtful, rational readers of the Scriptures, this volume if carefully mastered is likely to prove a guiding star towards a veritable land of promise. "There is," says the author, "one thing left to do with the Bible: simply to read it"; and to aid the simplicity of this commonsense procedure is the *raison d'être* of the volume before us. In every division of the work the reader will come upon absolutely novel suggestions which demonstrate their value by their lucidity, and ease, and charm, no less than by the careful scholarship which Professor Moulton employs to reinforce them. The section which deals with the wisdom literature of both the Old and the New Testaments is peculiarly

refreshing to read, and supplies a really brilliant exposition of a department of literature where as many stumbling-blocks exist as even in prophecy. In the latter subject, too, this volume is full of fertile hints; and the author's treatment of the Book of Revelation is deserving of marked attention and high praise. The Appendices will prove of great assistance to anybody who may feel drawn by this volume to take up afresh the study of the Bible from the merely literary point of view; for they present not only abundant references but suggestions towards a complete method of intelligent study, which, if it should be based upon this volume and lead on to Professor Moulton's larger work, will undoubtedly prove amply serviceable.

King Richard III. By F. E. Webb. 160 pp. (Blackie.) 10s.—A fairly good edition. There are in it a readable introduction, a good but closely printed text, and notes excellent for youngsters, a classified index, and some useful points of grammar and style. The list of familiar expressions is useful; so are the passages to be learnt, and the list of puns is curious and serviceable.

English.

Chapters on English Metre. By Professor J. B. Mayor, M.A. Second Edition. 300 pp. (Cambridge University Press.)—This volume is by no means a final treatise on English prosody, but it has so many merits that it will not only take high rank among the few attempts already made to deal with this little-considered subject, but it will be found of great use to all who are interested in the more delicate developments of a very intricate and rather contentious subject. It is highly elaborate, but it starts far beyond the ordinary needs of teachers of English; therefore we would suggest that the time has come when a good treatise on prosody, which should be serviceable to teachers whose time is limited and whose own acquaintance with the subject is rather elementary, might profitably be written. At the end of many grammars this division of English literature is treated in a cursory way; and students have to make a considerable leap if they want to pursue their studies, and to use advanced works, which, so far from presenting any view of the subject useful to candidates for Local Examinations, or even for undergraduates, are too nearly of the same character as this volume under review, and consequently fail to achieve any wide influence. A complete sketch of the development of English prosody, faithful to the history of literature, unencumbered by too much detail, and devoid of all that seems viewy and faddy, would probably receive a generous welcome. Mr. Mayor expressly disclaims all pretence of completeness. Those who want information upon the æsthetic or historic sides of metrical investigation will not find it in these pages. Alliteration, rhyme, and the early history of the prevalent models of English verse, do not enter into the writer's scheme, as he himself allows; though by so doing he makes clear the general lines upon which new and interesting investigations may be pursued. The whole subject is one for grammarians rather than for poets, and as dealt with upon the high level attained by Mr. Mayor is a fruitful theme for bickering of a pedantic kind. The author occupies the first eleven pages of his work by stating with fairness and moderation his own views, which will be acceptable enough to the scientific mind, if only as matters of debate. When, later in the volume, Mr. Mayor tests verse by illustrations, those that are drawn from Tennyson seem to be singularly happy, and the treatment of them more felicitous; but when the author applies his tests to hymns he surely fails; for when were any but the very poorest proportion of hymns fit to be considered as poetry at all? It is sufficient to direct readers to the chapter on Shelley's versification for much elaborate and interesting information; also, for the best contribution included in this work, to the concluding chapter on the Hexameter and

Pentameter in English verse. The whole volume is lucid, illuminative, full of attractive sidelights, and, of course, most scholarly; but this last chapter is emphatically fine.

A First Course of Essay Writing. By J. H. Fowler. 36 pp. (Black.) 6d.—Thirty-seven outlines of essays on various subjects, with a few additional exercises and subjects for essays. A useful little book.

Coloured Pictures for Composition Lessons. Set 1. (Nelson.) 2s. the packet of twelve.—The pictures are ready gummed so as to be affixed to the child's paper. We like the idea and welcome the new venture.

History.

Companion to English History (Middle Ages). Edited by F. P. Barnard. xv. + 372 pp. (Clarendon Press.) 8s. 6d. net.—This volume consists of twelve sections, each dealing with some phase of English history which is not generally treated in the ordinary text-books. These are: ecclesiastical, domestic, and military architecture and the art of war; costume, military and civil; heraldry, shipping, town and country life, monasticism, trade and commerce, learning, education and art. These are followed by a glossary and an index. There are ninety-one plates of illustrations, many of them photographic and all good. When we add that each section has been written by an acknowledged master of his subject, our readers will perceive that here we have a book which is, we might almost say, indispensable to them; one, at least, in which they can wander at large, finding pasture everywhere. Of course, there is a certain amount of overlapping, but it has been reduced to a minimum, and leads only to repetition which is profitable. Besides the abundance of information thus collected into a short space, each section contains bibliographies. We very heartily commend the book to our readers.

A History of Modern Europe from the Fall of Constantinople. By T. H. Dyer. Third Edition, revised and continued to the end of the nineteenth century, by A. Hassall. Vols. V.-VI. (1789-1900). xiii. + 532; x. + 363 pp. (Bell.) 6s. each.—In the February number of THE SCHOOL WORLD, we noticed the first four volumes of this work. We then remarked on the small number of changes which had been introduced by its new editor, but suspended our judgment on the whole because we were assured that the new light of modern research bore specially on the Napoleonic period that was still to come. We have now received the two concluding volumes, and our feelings are those of astonished disappointment. We have compared the text of these two volumes with the corresponding parts of Dr. Dyer's second edition with even more care than we gave to the earlier volumes, and, as far as our observation goes, we have discovered not more than a dozen alterations of Dr. Dyer's facts or opinions. These consist mainly of changes in the appreciation of Mirabeau and Robespierre, and in the substitution of "Vienna" for "Schönbrunn" as the name of the Franco-Austrian Treaty of 1809, though even here Mr. Hassall once leaves the old name as it stood. But in the specially Napoleonic period, *i.e.*, from 1797-1815, while there are several new books mentioned in the footnotes, there is practically no alteration in the text. Long passages are omitted, sometimes of picturesque incident, sometimes of useful narrative, and the consequently necessary emendations have not always been made, so that nonsense is the result of the omission. "German" has wrongly been substituted for "Prussian" on page 23 of Vol. VI. The first half of chapter lxvi. is persistently headed "Peninsula (*sic*) War." "*Orange-boven*," "*ca ira*," and "*çi-devant*" have been left uncorrected, and the "not" which Dr. Dyer inadvertently left in the Treaty of Campo-Formio still gives Porto Legnano to France. In the

curiously jumbled bibliography which Mr. Hassall gives in Vol. VI., there is no notice of Seeley's "Life of Napoleon," nor, more astonishing still, of the great collection of Russian treaties which Professor F. Martens began to publish nearly thirty years ago. If Mr. Hassall had known of that collection he would not have allowed two statements to stand as Dr. Dyer left them. On page 201 (Vol. V.) he would have omitted the non-publication of the Russian accession to the Brito-Austrian Alliance of 1795, and he would have rewritten (page 281) the account of Russia taking part in the war of 1798. The "continuation to the end of the nineteenth century" is scanty and confused. Whereas, even in the shortened edition now presented, Dr. Dyer never gives less than an average of four pages to a year, sometimes six or eight, and in the Revolutionary and Napoleonic period, over twenty, Mr. Hassall has dismissed the thirty years, 1870-1900, in forty pages, an average of one and a third. In a word, if our readers possess Dr. Dyer's edition of 1878, they will gain very little by getting this new edition.

Geography.

The Nearer East. By D. G. Hogarth, M.A. xv. + 296 pp. (Heinemann.)—Mr. Heinemann's new series of handbooks on the Regions of the World is, in our opinion, a most important advance in geographical literature. The volume before us fully maintains the high level of excellence attained by Mr. Mackinder's stimulating volume on Britain. The facts themselves have been treated in many a portly tome, but never before have they been so skilfully marshalled and yet subordinated to the presentation of "the causative influence of geographical conditions on man." The Nearer East is a region of absorbing interest to the churchman, the historian, the statesman and the teacher; the general reader, too, will be fully repaid by a careful study of the subject matter by the light of a good atlas and Mr. Bartholomew's beautiful map-pictures which add so greatly to the value of the book. The text is divided into two separate parts; the first discusses the underlying physical causes, the latter traces out the effects. The five chapters devoted to configuration describe each of the integral parts of the region in considerable detail, and are for the most part models of clearness. It is perhaps unfortunate that the "Balkan Belts" leave the least clear impression on the mind, and we regret the addition to our already over-complicated nomenclature of such terms as "spines," "ganglia," "swells." Moreover, the diagrams fail to illustrate the text just when they are most needed; they are inaccurate in many details, and sufficient care has not been taken to make the spelling of names agree with the text. The chapter on Climate is perhaps the least satisfactory; we should have thought that a simple explanation of dependence of winds on relative pressure, illustrated by good diagrams of isobars and winds, would have made it far clearer than the vague use of inaccurate terms, such as "polar current," "steppe winds," "mountains attract moisture"; and we would urge that too much stress has been laid on the deflecting power of mountain masses. It seems almost ungracious to criticise where almost all is excellent, and we cordially recommend the book. It should find a place in all school libraries, and be on the favoured shelf of all teachers of history or geography.

Atlas for South African Schools. By J. G. Bartholomew, F.R.G.S. 48 maps. (Nelson). This atlas has now reached a fourth edition. Mr. Bartholomew's name is a sufficient guarantee of the accuracy with which the work has been prepared. Although it is intended primarily for South African schools, it will be found of great value in this country. Several plates illustrate the General Physical Geography of the world; fourteen of the maps deal exclusively with South Africa, and

six of these have been prepared from the latest surveys. All the maps are clear and the colouring leaves nothing to be desired.

Descriptive Geography from Original Sources. Central and South America with the West Indies. By F. D. and A. J. Herbertson. xxxiii. + 239 pp., 24 illustrations. (A. & C. Black.) 2s.—Teachers will find the new series of geographical anthologies selected and edited by Messrs. Herbertson of immense value in imparting vividness to their geography lessons. In a previous review we indicated the general plan of each volume—a preliminary survey of the region dealt with, illustrative descriptions from the best known explorers and writers, plus a bibliography. In the present case the names of such eminent authorities as Colonel Church, Sir Clements Markham, Dr. Wallace, are sufficient guarantee of the accuracy of the descriptions. Some of the best extracts have been taken from the *Journal of School Geography* and the papers of several geographical societies. There is a misprint near the bottom of p. 5—is for it.

A series of maps that we can recommend for class purposes is *Synthetical Maps*, by W. R. Taylor. Each map is in three parts, and serves the purposes of an atlas, test and notes combined. They cost 2d. each. (Black.)

Science and Technology.

Beasts of the Field, x. + 332 pp., and *Fowls of the Air*, xii. + 310 pp. By William J. Long. Illustrated by Charles Copeland. (Ginn.) 7s. 6d. each.—These two delightful volumes include most of the studies which Mr. Long has previously given us in "Ways of Wood Folk," "Wilderness Ways," and "Secrets of the Woods." They are published in response to requests for better and more fully illustrated editions. While we cordially welcome the essays in their daintier dress, we hope the cheaper volumes will continue to be available, for they ought to be in every school. The author dedicates his new editions "To the teachers of America, who are striving to make Nature-Study more vital and attractive by revealing a vast realm of Nature outside the realm of Science. . . ." It is to be regretted that the prevalent idea should be that science is the reverse of "vital and attractive," or that any phase whatever of Nature-Study should be considered "outside the realm of science." On the contrary, these essays themselves form a valuable contribution to a branch of Biology which is nowadays too much neglected—the impartial study of the habits of animals in their natural surroundings. The illustrations are all charming. If anyone wishes to give a delightful present to a boy or girl, let him get these books. If after seeing them he carry out his intention, he is to be congratulated on his unselfishness.

Introduction to Chemistry and Physics. By W. H. Perkin, Jr., Ph.D., F.R.S., and B. Lean, D.Sc., B.A. New Edition. xviii. + 204 + 209 pp. (Macmillan.) Two vols.; 2s. each.—This text-book forms a new edition of "An Introduction to the Study of Chemistry" (by the same authors), which was published in 1896, and the various modifications introduced have undoubtedly improved the value of the book. The authors state, in the preface, that the division of the book in two volumes is desirable, since the previous edition contained at least two years' work, and that a student becomes tired of a long-unfinished book. Three somewhat difficult chapters of the previous edition have been omitted, and will be included in a third volume which is now in preparation. Three entirely new chapters have been added, viz., "Graphic Methods of Representation," "Discovery of Common Metals (Blowpipe work)," and "Fuels and Food-stuffs." These new chapters are extremely educational.

and are written in a thoroughly attractive style. The exercises on "Graphic Methods" (which, the reviewer believes, were first given prominence in Gregory and Simmons' "Elementary Physics and Chemistry," 1900) will render the student thoroughly conversant with the essential use of squared paper. Vol. I. is chiefly devoted to Physics, with a few concluding chapters on Preliminary Chemistry. Vol. II. is mainly on chemical subjects, together with chapters on the quantitative determination of the properties of gases. Several typical examination papers (both theoretical and practical) are inserted at the end of each volume. The first edition was an excellent textbook, and the authors are to be congratulated on the introduction of such evident improvements.

The Circle Series of Science Note-Books. (Blackie.) 1d. each.—These exercise-books will be found convenient for elementary practical work in a physical laboratory. They may be obtained with pages ruled either in centimetre squares or in $\frac{1}{4}$ -inch or $\frac{1}{8}$ -inch squares; the last-named can be particularly recommended, since the size of the squares is best suited for plotting simple curves, and the pages of squared paper alternate with pages of plain-ruled paper for notes. The size of the page is 6 × 8 inches.

Miscellaneous.

Pestalozzi. By A. Pinloche. 306 pp. (Heinemann.) 5s.—Pestalozzi was dirty, ugly, unkempt, unbrushed, badly-dressed, down-at-heel; he had no manners, even in the eyes of Germans; he had a brazen voice, a villainous accent; he let all his class answer simultaneously in a very pandemonium of noises; he made them repeat by rote what they certainly did not understand. He had nearly all the faults which the professional trainer righteously condemns. The Board of Education would have refused him a certificate, and any leave to take pupil teachers; the Cambridge Syndicate would have passed neither him nor his schools; the Oxford Delegacy would have sent him back to his Comenius; the College of Preceptors would have made hay of his Notes of Lessons; the very clever examiners of the National Frœbel Union would not even have looked at a fellow so compact of fingers all thumbs; the meanest training authority would have rejected him; and on the official Register of Teachers with which we are to be blessed he would have appeared by grace only, and only if he applied within the next three years. The fee he would, no doubt, have borrowed. He was, indeed, so bad at business that every enterprise he managed went bankrupt; he had so little tact that his colleagues were perpetually at loggerheads with their chief or amongst themselves; and he could not impress favourably even a government commission. Yet he was "Father" Pestalozzi to all and sundry; every body was "fond" of him, even his most censorious colleagues; his pupils loved him to the end; and he never really lost his hold on public respect and admiration. And more. He was the formulator, if not the progenitor, of some of the most fruitful theories of education and improved "methods." He is the spiritual father of Herbart as well as of Frœbel, both of them stimulated by his influence—Frœbel to systematise the appeal to "sense-perception," Herbart to define the real nature of "interest." These things and many more are to be learnt from M. Pinloche's very useful book, which gives us a life of Pestalozzi, with scrupulous plain-speaking, and an account of his opinions and the arguments by which he justified them. This account is made up of extracts from or abstracts of parts of Pestalozzi's works and of official papers, some hitherto inaccessible; and they are as consecutive and coherent as their nature (that is, Pestalozzi's nature) permits. The psychology is often inept and futile, the reasoning fanciful, the arguments circular; yet there can be no doubt that this queer channel of the grace of God was inspired. Often in his

worst moments, when he is involved in a cloud of obscure metaphor, he bursts out with a luminous idea like a prophet. Many things were done for us by Pestalozzi. He lived the life of a true teacher and lover of his kind; he was absolutely disinterested. He was no agitator, he was concerned to push no particular organisation under heaven in either church or state; nor even any particular study or pursuit, which is the custom of our own breed of enthusiasts. His passion was to improve his children. He preached and he demonstrated that the least important things in education are apparatus and cunning appliances, which are, indeed, very well for *learning*, but are mostly mere incumbrances on the real disciplining of the human spirit, for what the true teacher needs is the pupil alone. He gave a real content to the Comenian plan of teaching by means of the eye, making the pupils describe exactly what they saw, if it was only an irregular-shaped patch on the badly-papered school wall. We know no book that does for us what M. Pinloche's does; and it is therefore very welcome. We wish the rendering here presented had been always scrupulously English. Sometimes, as, for instance, in the perpetual use of the locution "different *to*," it gets on our nerves. But even Pestalozzi was sometimes short-tempered.

The Stars in Song and Legend. By J. G. Porter, Ph.D. With Illustrations from the Drawings of Albrecht Dürer. xiv. + 129 pp. (Ginn).—The writer of this notice has for several years had in mind the preparation of a book connecting the study of the constellations with classical legends and folklore referring to them, but Dr. Porter's elegant little volume makes it unnecessary to proceed further with the matter. The remarkable discoveries of modern astronomy have caused people to leave the study of the sky to observatories, whereas the most interesting observations can be made with the naked eye. Before learning about spectrum analysis applied to celestial bodies, or the surface markings on planets as revealed by the telescope, students of astronomy should become familiar with the skies, note the stars in the seasons, the relative positions of the sun and moon during a lunation, the apparent motions of planets and similar phenomena. These appearances were followed with intelligence thousands of years ago, yet most people to-day are unacquainted with them. In early days the heavens were closer to the earth than they are now; so we find that classical myth often has an astronomical significance, the constellations and their apparent motions representing the apotheosis of the actors in a terrestrial drama, though whether the legend suggested the designation of star-groups or the stars gave birth to the legend cannot easily be decided. Dr. Porter brings together much simple legendary lore of the heavens, and the teacher of classics will find his volume just as inspiring as the observer of the skies. The illustrations show the constellations with the figures found on old star-maps and celestial globes. It is a little surprising that, as the book is of American origin, Dr. Porter only mentions a few of the astronomical beliefs and ceremonies of American Indians. For instance, we find no reference to the tradition of the Micmac Indians, that the stars are watch-fires, the bright ones being those of chiefs, or of Dr. Fewkes' detailed studies of the Hopi Indians at Walpi, where observations of the positions of the sun at sunrise and sunset are used to regulate the commencement of a ritual connected with sun-worship. It is also worth consideration whether a short chapter on the planets known to the ancients might not be added with advantage, as most people are unable to distinguish them from stars.

Pastor Agnorum: A Schoolmaster's Afterthoughts. By John Huntley Skrine. xv. + 275 pp. (Longmans.) 5s. net.—The Warden of Glenalmond speaks of the writing of a book on education as a terror with which he was daunted when he commenced work upon the volume before us, and on more than

one occasion he gives the impression of regarding a little contemptuously the occupants of chairs of pedagogy. The reader who procures the book must not expect, therefore, to find a formal treatment of the principles of education. But he will become possessed of a pleasing and helpful account of the long experience of a successful headmaster who has been actuated always by lofty ideals and impressed ever with the nobleness of the schoolmaster's work. To Thring's influence the pages bear eloquent testimony. There is throughout the volume abundant evidence of the high importance attached by the author to the cultivation of each boy's individuality, and a practical common sense which preserves a proper perspective in estimating the relative positions of work and play in a youth's education, pervades every chapter of the book. We are confident that no earnest teacher can read Mr. Skrine's "Afterthoughts" without a subsequent resolution to disregard present petty vexations in the contemplation of the far-reaching effects of the schoolmaster's influence on the schoolboy's life.

CORRESPONDENCE.

The Editors do not hold themselves responsible for the opinions expressed in letters which appear in these columns. As a rule, a letter criticising any article or review printed in THE SCHOOL WORLD will be submitted to the contributor before publication, so that the criticism and reply may appear together.

A Delicate "Wet" Test for Potassium.

In the course of laboratory instruction at the South-Western Polytechnic, the value of the insolubility of potassium picrate as a test for potassium was brought under the notice of the writer by a student, but particulars of the conditions under which the test could be applied with certainty could not be given. The matter was investigated, and the following were the chief points noted:—

(a) The test is about twice as delicate as that with platinum chloride, the latter reagent failing to give a precipitate with solutions containing 1 part of potassium chloride in 200 of water, while the addition of sodium picrate to a solution of 1 part of the salt in 500 of water gave a characteristic precipitate.

(b) Ammonium salts gave a similar precipitate, but the test is much less delicate.

(c) In solutions containing free mineral acids the test was vitiated, but it was found that in solutions rendered *slightly* alkaline with NaOH the results obtained were almost as good as with neutral solutions.

(d) The addition of strong alcohol and stirring with a glass rod promoted the formation of the precipitate from weak solutions of potassium salts.

(e) The presence of magnesium salts did not affect the precipitation, but sodium carbonate must be absent.

In solutions containing mixtures of salts the test may best be applied as follows:—First remove the heavy metals and the metals of the alkaline earths from the solution of the substance under examination by the usual analytical methods. Evaporate the remaining liquid to dryness, and ignite to expel ammonium salts. Dissolve the residue in a little water, and destroy any soluble carbonate present with acetic acid. Place a few drops of the solution thus produced in a watch-glass, and add twice its bulk of strong sodium picrate solution. Allow the liquid to stand for five minutes. The presence of potassium in any quantity is denoted by the production of a beautiful precipitate in the form of long yellow glittering spicules.

Should no precipitate appear after five minutes' standing, add an equal bulk of strong alcohol and stir vigorously with a glass

rod. A yellow crystalline precipitate along the lines of stirring indicates the presence of potassium.

No danger attends the use of sodium picrate as a reagent, provided it be kept in solution.

CHAS. W. HALL.

South-Western Polytechnic,
Chelsea.

The Training and Registration of Teachers.

AMONG educational questions now before the public, not the least important is that of the training and registration of teachers in secondary schools, a matter on which the future success of English secondary education largely depends. I would therefore beg for a few lines of your space to direct attention to the matter from the point of view of the head of a large secondary school.

The Order in Council of March 6th, 1902, appears to contemplate a double basis for a course of training for the young college graduate who wishes to teach in grammar and high schools. Such a person may undergo a course of professional study at certain universities or training colleges or may become a student teacher in a recognised school. The danger with the former is that professional theory may be divorced from the best professional practice, and the training be, therefore, somewhat too academic. A more serious danger in the second method is the introduction of a veiled pupil-teachership, whereby needy schools may be tempted to employ an unfair proportion of such teachers and thus injure the position of the staff and the work generally. It is to be hoped that the Registration Council may be able to safeguard the profession of teaching by securing for training colleges and universities *adequate* facilities for practice in the best schools, and, on the other hand, that the student-teacher system may not be made a cheap and easy option whereby students may, as it were, learn the mere tricks of the trade without any broad basis of philosophical study of education. These dangers may be avoided if the schools and universities would combine to evolve a method of training teachers analogous to the professional training of the best medical schools, and so secure professional efficiency, as the new Order in Council secures professional status.

Manchester High School,
May 17th.

SARA A. BURSTALL.

The School World.

A Monthly Magazine of Educational Work and Progress.

EDITORIAL AND PUBLISHING OFFICES,

ST. MARTIN'S STREET, LONDON, W.C.

Contributions and General Correspondence should be sent to the Editors.

Business Letters and Advertisements should be addressed to the Publishers.

THE SCHOOL WORLD is published a few days before the beginning of each month. The price of a single copy is sixpence. Annual subscription, including postage, eight shillings.

The Editors will be glad to consider suitable articles, which, if not accepted, will be returned when the postage is prepaid.

All contributions must be accompanied by the name and address of the author, though not necessarily for publication.

The School World

A Monthly Magazine of Educational Work and Progress.

No. 43.

JULY, 1902.

SIXPENCE.

THE ENGLISH ESSAY IN SECONDARY SCHOOLS.

By J. H. FOWLER, M.A., Clifton College.

Author of "A Manual of Essay-Writing," &c.

I WAS much impressed by the remark made to me a few years ago by a public-school master who had had experience of the essays written in the lowest form and again in the highest form of a modern side. There was a certain difference between them, he said, due to the different age of the writers, but there was no improvement: *variantur, non augetur*. This may have been, though I fear it was not, an extreme case; but I feel sure there is no part of public-school work more full, on the whole, of weariness and disappointment to master and pupil than English composition.

That this is so I believe to be mainly our own fault. We have no good tradition to help us, as in most other departments of teaching. Only in very rare cases in the past has English composition been taught both systematically and well. Such schoolmasters as are themselves capable of writing a good essay have acquired the art largely by the happy gift of nature, or indirectly from the practice of Latin and Greek composition and the study of English models which that practice involved, or from practice at the University and in maturer life. Many reasons, besides their own independence of it, make them distrustful of systematic teaching of this subject. They dislike the pedantry of the old-fashioned text-book of composition, with its mischievous assumption that all essays ought to be cut after one pattern, or its baneful directions for writing out the obvious and commonplace at full length. They have an English, or perhaps a Platonic, dislike to rhetorical fluency, which they think the practice of composition, like the practice of debating, is apt to encourage. They know that a modest reticence is a fine virtue in boyhood, and they fear to injure it by demanding premature self-expression. Still more profoundly do they fear to foster cant, literary, artistic, moral or religious, by essays in which the pupil may be tempted to express sentiments he does not really feel. Lastly, they have the deeply-rooted English aversion to academies—

the dislike to the imposition of any literary rules whatsoever, the strong predilection for a style that is the combined result of an instinctive imitation of good models and an instinctive individuality.

This, I think, fairly represents the feeling of the literary schoolmaster—the man who, by virtue of his own literary feeling, has had the most striking success in inspiring the exceptional pupil with the best sort of enthusiasm, though he may leave the average pupil with nothing more than the disheartening, but still valuable, impression that there are mysteries in composition which it is for him to admire but not to explore. On the other hand, the schoolmaster who is not literary either regards composition as an occult art into which he himself has never been initiated, or altogether disbelieves in it, with the same sort of instinctive dislike which the religious or political partisan feels for a philosophical argument which he cannot understand, but suspects of undermining his own position.

Meanwhile, the need for really adequate teaching of English composition is becoming more urgent. Every year the proportion of boys in secondary schools who learn their own language through the study of Latin and Greek grows steadily smaller. Only when we have abandoned the practice of classical composition shall we realise how splendid a training it gave in our own language. The periods of Burke or Gibbon, the lines of Milton or Shakespeare, were studied with a probing to the bottom of their meaning, a minute attention to each shade of expression, a careful weighing of each deliberate or unintended emphasis and subtlety of rhythm or association, such as we shall probably never attain in any other circumstances. To all who have had the good fortune to undergo this training the want of it is lamentably apparent in the work of popular writers of the present day. The best and purest English may indeed be written without it by the favoured child of genius; but even he is almost certain to suffer at some point from the lack of that self-criticism which is the happy fruit of this most strenuous form of literary training.

If the English essay cannot do all that has been accomplished for the ablest boys by Latin and Greek composition, it is at least certain that it can be made to do a great deal more than it has generally done hitherto. I will go further, and

say that I believe that in some important respects it can be made to do a great deal more than classical composition by itself can generally achieve. For classical composition is undoubtedly exposed to the weakness of concentrating attention upon the manner as distinguished from the matter—of leading its practitioners to care more for the way in which they say a thing than for the intrinsic value of the thing said. English composition, too, may easily be taught with the same deplorable result. But it may also be made what classical composition cannot be made so easily—a training in thought even more than in expression.

In order that it may be made this, the teacher must have a high ideal before him and be prepared to give time and thought. He must choose subjects that are within the comprehension of his pupils and are capable of interesting them. But his anxiety to conciliate in these two ways must never lead him to forget that his first object is to educate his pupils, to widen their comprehension, to enlarge their interests. He must not be too careful to keep at their level; he should be continually seeking to lead them to a higher. Treated in this spirit, the English essay may be used to foster observation and reading, independence and clearness of thought and breadth of sympathy—in a word, all that we mean by culture. And even so we have not exhausted its usefulness. For there is a sense in which the "art of words" is not what Plato was fain to consider it—the mischievous rhetoric that is set upon making the worse appear the better reason—but one of the most valuable arts of life, the art of self-expression. How many misunderstandings, some of them tragic in their consequences, might be avoided by the cultivation of this power! From the statesman, whose failure to measure the significance of the words he uses misleads his party and his country or inflames the hostility of a foreign nation, to the humblest member of the community, there is no one who can forego this art with impunity. Yet there is no art we take so little pains to acquire.

My purpose in writing this paper is mainly to emphasise the value of the English essay in schools as an intellectual training, and to plead for a more careful study of the best ways of teaching it. I proceed with some diffidence to suggest a few principles which seem to me worth keeping in mind. If they appear obvious to some readers, I can only plead that they are far from universally observed.

In the earlier stages oral preparation in class is essential. The pupils should be encouraged to frame complete sentences orally. It is too often forgotten that the Socratic method is not seen at its best when Glaucon and Adeimantus give the "Yes" and "No" which the reader anticipates as inevitable, but when one of them strikes out an original suggestion or an unexpected objection. This they do somewhat rarely, even in Plato. Perhaps we can hardly look for it, then, at the stage of which we are speaking. But even be-

ginners can be practised in the putting together of whole sentences orally, in the telling of a consecutive story, or in the oral recapitulation of a lesson. Thus they will be more likely to understand, when they come to write, that no sentence is complete without a subject and a predicate.

Most essays in this stage will be narrative or descriptive. There are fortunately a variety of simple objects—cats, dogs, birds, flowers, pictures, houses, games—that come within the scope of the most inexperienced child's observation. To these should be added some subjects for which the teacher supplies the material. History and geography lessons should be utilised, if only to help the child to realise the interdependence of his studies—that progress in one can be made to help progress in the others. The reproduction of stories or historical incidents will form a valuable exercise in composition, provided that a little time is allowed to elapse between the original reading and the reproduction. If the reproduction is immediate, it becomes a mere effort of memory. At the same time, whenever an essay, whether of the nature of reproduction or not, is based upon a book, it is important that the pupil have no access to it at the time of writing. The ability to use a book for an essay in any other way than by copying belongs to a quite late stage in the art of composition—a stage not always reached by those who publish their productions.

As to correction, it should never be limited to the criticism of writing, spelling and grammatical mistakes. Written correction in most cases cannot go far beyond this, nor is there any reason why it should. Errors of taste, flaws in reasoning, faults of arrangement, generally fall into a few well-defined groups. The teacher can make notes of illustrative instances as he reads through the essays and comment on them to his class. He may sometimes find it a good plan to write, or sketch orally, a sort of "fair copy." If he does this, he should make it clear that he is giving only one out of several possible ways of handling the subject—that there is no cut-and-dried pattern for the English essay. The correction of compositions, as of all school exercises, should be prompt. A class will only be interested in the discussion of an essay as long as their own efforts and difficulties are fresh in their recollections. These remarks apply to all grades of composition-teaching.

In the higher grades a much greater variety of subjects is obviously available. Quite as much as in the lower stages, or even more, the essay should be brought into relation with the school subjects—the period of history which is being studied, the foreign or classical author who is being read. But subjects removed from the regular school course should sometimes be chosen just as deliberately. For the essay must now be made to stimulate and widen a pupil's reading and to teach the beginnings of literary criticism and moral reflection. Here, again, we can hardly expect our pupils to think for themselves, if we set them subjects on which they can find the thinking done for them. But a little forethought will often discover a subject for which the

pupil can get no direct help from books, though he must read books in order to treat it properly. If we demand a character of Achilles or Hotspur, for example, we may be sure that no boy who finds remarks upon them in an introduction to Homer or Henry V. will make his reflections independently. But we may profitably ask for a comparison between the two characters. Some boys at least will be sufficiently interested to read Homer and Shakespeare for themselves and draw out the points of likeness and of contrast. It would be difficult to rate too highly the value of the mental stride a pupil takes when he first consciously makes a literary and ethical judgment of this kind for himself. A valuable mental exercise is also afforded by talking to a class on a subject that might be too difficult for them to handle unaided, and then setting them to write an essay on it. In this case a wise teacher will know how to encourage any signs of independent thought or study on the part of his pupils. Again, the lectures on scientific or artistic subjects that are occasionally given at most schools may be used to provide subjects. The knowledge that an essay is to be written will stimulate attention at the lecture, and the writing of the essay will save the lecture from having merely transitory results. But care should be taken to find, in this as in every other case, a subject that is capable of being treated within a limited compass. Most lectures are inevitably discursive, and the pupil, if left to himself, will be lost in the wood of the lecturer's anecdotes.

Finally, may I urge that we defeat our own object if we require essays too often? For we want our standard, for our best pupils at least, to be a high one, and the best work cannot be done every day. I believe that an original essay ought not, in the highest forms, to be written more than once a fortnight at most. In alternate weeks exercises might be given in the reproduction of passages read aloud from the great prose-writers, in the translation of extracts from the Elizabethan writers into modern prose, in the analysis of sentences or the disentanglement and reconstruction of faultily constructed periods.

Sancta Paula, a Romance of the Fourth Century, A.D.
By Walter Copland Perry. 8 illustrations. xxiv.+ 334 pp. (Swan Sonnenschein.) 6s.—Sancta Paula was one of the "honourable women not a few" who were associated with S. Jerome in both his philanthropic and his literary work; and this book is simply the story of her life embroidered with descriptions of the political, social, and economic conditions of the Roman Empire at the time, mostly from the works of Jerome himself. We are introduced to Valens, Valentinian, Damasus, Jerome, &c., and are taken to Rome, Constantinople, Nicopolis, and Bethlehem. Mr. Perry's book thus belongs almost more to the "Gallus" and "Charicles" order than to the order of pure romance. But sometimes—e.g., when he speaks of Penelope's suitors as Phaeacians, and places Ithaca among the Cyclades—we have our doubts as to whether Mr. Perry's scholarship equals his enthusiasm. Still his story gives an adequate picture of an interesting period to many persons who would not read either the works of S. Jerome or Mr. Dill's "Roman Society in the Fourth Century, A.D."

THE TEACHING OF MATHEMATICS AT PREPARATORY SCHOOLS.

By CHARLES GODFREY, M.A.

Senior Mathematical Master at Winchester College.

II.—ARITHMETIC.

ARITHMETIC is begun at an early age, but it is not with the rudiments that the present article will deal. There are, however, a few points which deserve some mention.

MULTIPLICATION.—It is a pity that children are not taught from the beginning to multiply by the left-hand figure of the multiplier first. This has to be drilled into them later on as a preparation for contracted methods; and some time is lost in substituting the new rule for the old.

SHORT DIVISION seems to be unfamiliar to many boys. Perhaps the method is out of favour on account of certain mysteries connected with the remainders. Still, it is a useful process; and at first examples without remainders might be chosen. Subsequently the remainders would be expressed as fractions, or better, as decimals.

PRIME FACTORS; H.C.F.; L.C.M.—Prime factors are not well understood; the ordinary mechanical rules for H.C.F. and L.C.M. are educationally worthless. The following method forces a boy to think:—

Find, by the method of prime factors, the H.C.F. and L.C.M. of 240, 540, 225.

$$\begin{aligned} 240 &= 2 \times 120 = 2^2 \times 60 = 2^3 \times 30 \\ &= 2^4 \times 15 \\ &= 2^4 \times 3 \times 5 \\ 540 &= 2 \times 270 = 2^2 \times 135 = 2^2 \times 5 \times 27 \\ &= 2^2 \times 3^3 \times 5 \\ 225 &= 5 \times 45 = 5^2 \times 9 = 3^2 \times 5^2 \end{aligned}$$

H.C.F. = $3 \times 5 = 15$.

L.C.M. = $2^4 \times 3^3 \times 5^2 = 10800$.

No rules should be given for deducing the H.C.F. and L.C.M. from the factors.

TABLES OF WEIGHTS AND MEASURES.—These ought to be purged. Everyone hopes that the metric system will eventually be adopted by this country. In the meantime we might agree to drop such survivals as troy weight, perches and poles, roods, gills, apothecaries' measure, and the like. Linear measure would give 1,760 yards = 1 mile; and square measure, 4,840 sq. yards = 1 acre, 640 acres = 1 sq. mile.

VULGAR FRACTIONS.—The tendency of good teaching will be to transfer the emphasis from vulgar fractions to decimals. At the same time the elementary principles of fractions must be understood. They are few in number; and the simplest sums illustrate them best. Complicated exercises are very useless; no one ever wants to simplify an expression much more elaborate than $\frac{\frac{4}{5} - \frac{3}{4}}{2}$. The most fundamental and least

familiar principle is that numerator and de-

nominator may be multiplied (or divided) by the same number without altering the value of the fraction. This can be illustrated on squared paper as follows :—¹

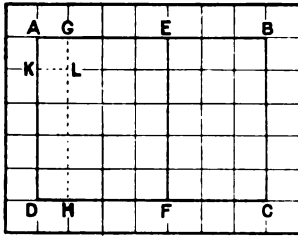


Fig. 1.

To prove that $\frac{4}{7} = \frac{20}{35}$.
 Let ABCD be the unit.
 The strip AGHD = $\frac{1}{7}$.
 \therefore Aefd = $\frac{4}{7}$.
 The square AGLK = $\frac{1}{35}$.
 \therefore AGHD = $\frac{5}{35}$,
 and Aefd = 4 AGHD = $\frac{20}{35}$.

As a preparation for decimals, there should be a good drill in sums such as :— $\frac{1}{4} = \frac{25}{100}$; $\frac{3}{8} = \frac{375}{1000}$; $\frac{7}{20} = \frac{35}{100}$.

DECIMALS—THE METRIC SYSTEM.—The best way of beginning decimals is with the squared blackboard. Put on the board a number of parallel

Decimal Notation.						
TH.	H.	T.	U.	t.	h.	th.
7		2	5		7	9
Metric System.						
KM.	HM.	DM.	M.	dm.	cm.	mm.
7		2	5		7	9

FIG. 2.

vertical columns, with headings at the top to stand for thousands, hundreds, tens, units, tenths, hundredths, thousandths. A figure 7 put under H. is to mean 700; a figure 3 put under th. is to mean $\frac{3}{1000}$. This device gives excellent opportunities for oral work; the class should be told to read off the number on the board as a decimal with the zeros and point properly placed; 7025·079. It can then be shown to them that multiplying by 10 promotes each figure one place to the left, and so forth. Plenty of practice in multiplying and dividing by powers of 10 should precede any other operations with decimals; there are astonishingly

few boys in an entrance examination who can write down the quotient $76057 \div 1000$; the sum is almost always done by long division.

At this stage the metric system should be taught, in order

(1) to provide a concrete illustration of the decimal notation;

(2) to impress on a boy's mind the simplicity and convenience of the system.

To further the second object, no sums should be set at first dealing with conversion from English to metric units; these cannot be done with advantage until the approximate or contracted methods have been studied. The class-room should be furnished with a metre rule, and models of litres, cubic centimetres and decimetres, kilogrammes, grammes, &c. These objects can be bought from Messrs. Griffin and Co., Sardinia Street, London. It is a good thing to have yard, metre, sq. decimetre, sq. inch, &c., painted on the wall.

The connection of decimals with the metric system is well illustrated if the squared blackboard is employed for oral work with the latter in the manner which has been suggested for the former; the length in Fig. 2 should be read off in different ways, e.g., 7 kilometres, 2 dekametres, 5 metres, 7 centimetres, 9 millimetres; or 7025·079 metres; or 7 kilom., 25 metres, 79 mm., &c.

MULTIPLICATION AND DIVISION OF DECIMALS.—One of the most useful habits that a boy can be induced to acquire is that of checking his result by a rough guess at the answer. Thus, the quotient $31746 \div 21375$ is not very different from $300 \div 2 = 150$. There can, therefore, be no difficulty in pointing the answer. In dividing by a decimal the pupil is usually instructed to move the points till the divisor becomes a whole number. The writer ventures to recommend the alternative method of moving the point to the right of the left-hand figure of the divisor. Thus :—

$$\cdot 007965 \div \cdot 0787 = \cdot 7965 \div 787.$$

The boy would then say, "I am dividing something which is almost .8 by something which is almost 8; therefore, the answer cannot be very far from .1." He will always have to perform a trial division by the simplest possible divisor, a unit figure.

This way of dealing with the decimal point is much more instructive than any rule, and has the advantage of applying to contracted processes without alteration.

There is much to be said for moving the point in the same way for multiplication, especially when the left-hand figure of the multiplier is used first. Thus :—

$$\cdot 0436 \times \cdot 0275 = \cdot 000436 \times 275.$$

CONTRACTED MULTIPLICATION AND DIVISION should be taught to the better boys as soon as they are familiar with the exact processes. The old rule of inverting the multiplier is bad.

RECURRING DECIMALS.—A boy will easily see how recurring decimals make their appearance when he decimalises a fraction. There is no need

¹ For the various uses of squared paper see Cracknell's "Practical Mathematics" (Longmans); Kirkman & Field's "Arithmetic" (Arnold); Castle's "Practical Mathematics for Beginners" (Macmillan).

to pay any more attention to the subject for a long time. Certainly no one should be taught how to express a recurring decimal as a fraction until he has studied the sum to infinity of a geometric progression.

SQUARE ROOT is indispensable, and may very well be taught as a rule without explanation; the first few approximate roots that are found should be checked by contracted multiplication. It is an interesting exercise to verify square roots graphically; *e.g.*, if a right-angled triangle be drawn with two sides of one inch, the hypotenuse will be $\sqrt{2}$ inches, and then $\sqrt{2}$ may be found graphically to two places of decimals. (*Vide* the "Harpur" Euclid.)

CUBE ROOTS that cannot be found by prime factors should not be attempted.

DECIMALISATION OF MONEY. — It is doubtful whether the rule for decimalising at sight is worth teaching. But a boy ought to know a better method than that of reducing to farthings and dividing by 960.

To express £10 4s. 9 $\frac{3}{4}$ d. as a decimal of a pound.

$$\begin{array}{r} 12/9\cdot75 \\ 20/4\cdot8125 \\ \hline 10\cdot240625 \end{array}$$

£10 4s. 9 $\frac{3}{4}$ d. = £10·240625.

Rule of Three is generally, and rightly, replaced by the unitary method. A boy who is tired of the unitary method will invent for himself a way of shortening the work.

The idea of RATIO is so important that it ought to be introduced early; a good opportunity is provided by geometrical drawing: *e.g.*, "draw a triangle, then draw a second triangle whose sides are to those of the first in the ratio 3 : 2; find the areas of the two triangles, and the ratio of the greater area to the less." Reduction to a PERCENTAGE is a most useful process; the idea of "per cent." is not illustrated adequately by application to interest alone, but deserves a much more frequent reference.

AREA has been dealt with in a former article. The calculation of VOLUME, of rectangular parallelepipeds ("cuboid" is shorter), is usually taught as part of arithmetic. The one principle involved is that, if the cuboid measures *a* inches by *b* inches by *c* inches, *a*, *b*, *c* being integers, then the volume can be cut up into *a b c* cubic inches. If a boy understands this law for integral numbers, there is perhaps no harm in letting him assume its generality. But probably he never will understand it unless he has actually built up or seen his teacher build up a cuboid with real wooden blocks. Cubic centimetres are more convenient than cubic inches, and they are cheap. When the pupil understands so much, he may be set to find the volume of a tangible cuboid whose dimensions he is to measure. For class teaching it is advisable to have a set of more or less identical cuboids, so that one answer may suffice for the whole class. These objects can be bought

from Messrs. Griffin; or from Mr. G. Cussons, the Technical Works, Manchester.

INTEREST, simple and compound, gives good practice in contracted multiplication of decimals, which should be used in all but the very simplest cases. For an accuracy of 1 farthing, it is necessary to keep 5 places of decimals in the working; the figures in the 5th row being obtained without carrying.

Probably we spend more time on these financial problems than is warranted either by their educational value or by their utility in practice. There are many subjects that are easier and more instructive than Present Worth and Discount; certainly Stocks and Shares can be of no use or interest to a boy of 13.

ARITHMETICAL PROBLEMS are of course excellent work for young boys, especially if they may be done by algebra. Text-book writers have done all that is possible to spoil the subject by classifying problems and giving rules for the solution of each kind, work, pipes, races and games of skill, clocks, carpets and uniformly growing grass. The only point of setting a problem is to induce the learner to discover how to solve it. If he does it by rule, he might as well be learning irregular verbs.

Formulae are unwholesome diet for the young. It is generally found that the boy who papers a room with a formula is unable to paper it by any other means. The premature use of formulae in solving problems of inverse interest prevents the learner from getting any grip of what are really simple applications of unitary method.

The foregoing remarks may be summarised as follows:—

- (1) Few rules, and those to be found out by the boy himself, as far as possible.
- (2) More use to be made of decimals.
- (3) Simplification of the course by the omission of much that is hard or unprofitable.

It may be thought that after these omissions there will not be enough of arithmetic left. In answer to this, it may be urged that there is a great field for the application of arithmetic in connection with geometry. And the same is true of every branch of elementary mathematics: the more arithmetical it is made the more firmly it will be grasped.

Test Papers in General Knowledge. By Herbert S. Cooke, M.A. (Oxon.). vi. + 97 pp. (Macmillan). 1s. 6d.—Perhaps no part of a person's mental stock-in-trade is more difficult to test than the body of information known as general knowledge. The questions propounded, if they are to lead to a correct estimate and not be mere exercises of memory, should be designed to gauge what knowledge of men and things has been acquired by individual observation and experience rather than what has been learnt by rote from books. Speaking generally, Mr. Cooke had been very successful in suggesting suitable questions, but there are some things asked for which are not rightly classed as "general," *e.g.*, it does not matter if a person cannot explain "phylloxera." We should much like, too, to have the author's definition of "third edition" and "technical education."

LABORATORY FURNACES.

By HUGH RICHARDSON, M.A.
Science Master of Bootham School, York.

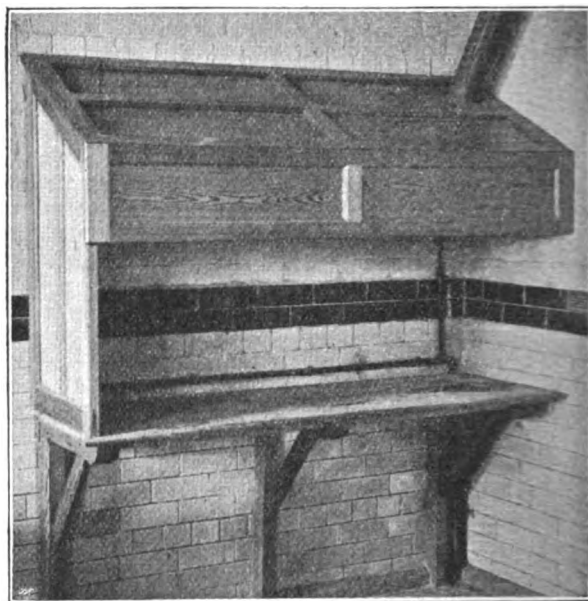
MANY teachers of science, especially those engaged in country schools, find great difficulty in selecting the most suitable forms of apparatus when making purchases for their lecture or laboratory teaching. They are bound to economise: this means getting as few things as possible and those as cheap as possible. If any special furnace can be used for a great many purposes, £5 may not be too dear. But some problems of organisation arise in trying to make one furnace suffice for twenty boys.

Application has been made to several of the best-known dealers in apparatus for information as to the forms of furnace they supply. Their price lists¹ present a curious similarity in repeating the same pictures and nearly the same prices.

There seems no question that Messrs. Fletcher, Russell and Co., of Warrington, are the leading English manufacturers. The quality of their goods seems everywhere approved. They advertise widely. They have supplied the new National Physical Laboratory and the Birmingham University and Technical Schools. Messrs. Brady and Martin and Philip Harris and Co. have replied by sending Messrs. Fletcher, Russell and Co.'s price list; indeed, Harris's own catalogue contains this list as an appendix. Messrs. Baird and Tatlock, Brady and Martin, and Gallenkamp, reprint the instructions for use of Fletcher's furnaces. Lastly, the fame of the "Gasbläseöfen nach Fletcher" extends to Herr Max Kaehler in Berlin. Messrs. Gallenkamp's list shows several (? continental) patterns in common with that of Herr Kaehler which most English lists omit. Messrs. Griffin have some patterns of their own which do not appear in other lists, and have supplied various Sheffield manufacturers.

For furnace experiments a school laboratory should be provided with some sort of a COMBUSTION HOOD larger than a draught closet, and allowing greater freedom of access. The table should be of iron, not slate, which cracks when heated. A wooden table-top may be protected by layers of asbestos board with $\frac{1}{2}$ -inch sheet-iron on top. A large main gaspipe—2 inches, at least, inside—and taps with $\frac{1}{2}$ -inch or larger throats are essentials for the larger furnaces. The hood should project

rather further from the wall than the table does. Its lower edge may be about 6 feet above the floor. There should be clear space inside for the upright chimneys which make the whole height of a draft furnace about 3 feet 6 inches. Details and estimates of combustion hoods may be obtained from Messrs. Reynolds and Branson, or from the North of England School Furnishing Co., Darlington. The catalogue of the former firm contains a picture of the metallurgical laboratory at the Leeds Technical School.



Combustion Hood.

(By North of England School Furnishing Co., Darlington.)

In considering the different experiments popular in our present school-courses we shall find some which require crucibles or combustion tubes, but do not need furnaces. And in furnace experiments the highest possible temperature is not always required; thus, in organic combustions the temperature must be applied evenly and gently, so as not to crack the glass tube, nor must it rise to the melting point of glass. Slow heating is secured by laying the tube on asbestos in an iron gutter. The final temperature may be moderated by air regulators and lever stopcocks, as in the ERLÉNMEYER and GLASER patterns. Nor is heat the only influence applied. Metallic ores are heated and oxidized to get rid of sulphur; oxides are heated in hydrogen, carbon monoxide or coal gas to reduce them to the metallic state. The evolution of carbon dioxide from calcium carbonate is a dissociation change increasing with temperature; the re-combination with falling temperature depends on the partial pressure of the circumambient carbon dioxide. Hence we must provide for the free escape of this gas. The crucible lid always retains heat; in some experiments it may protect a fused metal from the air, in others it may delay the escape of waste gases.

¹ Lists have been examined from:—Messrs. Baird and Tatlock, 14, Cross Street, Hatton Garden, E.C.; Messrs. F. E. Becker and Co., 33, Hatton Wall, Hatton Garden, E.C.; Messrs. Brady and Martin, Northumberland Road, Newcastle-on Tyne; Messrs. A. Gallenkamp and Co., Ltd., 19, Sun Street, Finsbury Square, E.C.; Messrs. J. J. Griffin and Son, 20, Sardinia Street, Lincoln's Inn Fields, W.C.; Messrs. Philip Harris and Co., Ltd., 144, Edmund Street, Birmingham; Herr Kaehler, Wilhelmstrasse 59, Berlin; North of England School Furnishing Co., Darlington; Messrs. Reynolds and Branson, 14, Commercial Street, Leeds; Mr. Wooley, Victoria Bridge, Manchester.

Internal evidence shows a common source for many of the gas furnaces in Messrs. Fletcher, Russell and Co., Warrington, whose "Workshop and Laboratory List, No. 229" is also before us. Crucibles and some large fire-clay furnaces come from the Morgan Crucible Co., Battersea. Messrs. Griffin are manufacturers as well as dealers, and their lists "Chemical Handicraft" and "Assayers' Materials" deserve attention.

The *reduction of copper oxide* is conveniently accomplished in the porcelain crucible over a Bunsen flame whilst a churchwarden tobacco-pipe keeps a flow of coal gas through the crucible. The copper must be allowed to cool in the same gas. Some copper melts into the glaze of the crucible; nitric acid fails to remove this, and for future experiments it becomes part of the crucible. The lead oxides are more troublesome; the lead melts, the oxide corrodes the crucible. The crucible is only cleaned by prolonged soaking in acid, and then part of the crucible has been taken away. The use of the brown oxide of lead as an illustration of the law of multiple proportions may lead to disappointment—a very honest chemist of my acquaintance supplied me with a sample of this oxide which yielded nitric fumes on heating.

The Berlin porcelain crucible may be used again for determining the *oxygen in potassium chlorate*. The first stage, with formation of perchlorate, is accomplished over the full flame of the Bunsen. The salt froths up on to the lid and possibly over the edge. By using a hard glass test-tube (Bohemian glass 3s. a dozen, better still Jena glass 4s. a dozen) the process can be watched through the glass. A recent explosion in Lancashire suggests that there is still something to learn from this time-honoured experiment. To finish the decomposition the tubes must be cautiously heated in a blowpipe flame, fed by foot bellows, until the resulting chloride is glassy clear. The cleavage planes which form in cooling look at first like cracks in the glass.

For BLOWPIPES either Fletcher's "Universal Blowpipe on stand" 10s., or their "Automatic on stand" 12s. 6d., can be recommended; for FOOT-BELLOWS Fletcher's Fig. 9, No. 3 size, price 26s. For boys' use the blowers with the rubber on top may be preferred, since youthful energy tends to overflow and burst the bladder, and all the more often when it is hidden from sight. The damage is inconveniently repaired with the help of the nearest rubber-goods shop; but better so than by returning the instrument to the makers. A word of warning is therefore needed before a class of beginners have free use of a fascinating plaything. But if once wilful carelessness bursts the bladder in play, and replaces it with three or four shillings of pocket-money, the whole class will be shy of using it for anything but legitimate work. The blowpipe and bellows are excellent for glass work. Its only defect is noisiness, tending to drown the teacher's voice in the class-room, and apt to countenance a noisy tone in the laboratory.

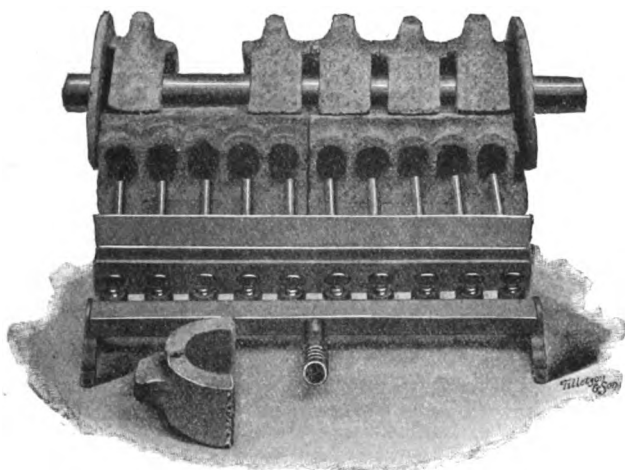
For strongly heating a single small crucible it may be placed within a FIRE-CLAY FURNACE standing on a tripod (Griffin's 1,201, price 8s.). Messrs. Gregory & Simmons, in "Elementary Physics and Chemistry," Third Stage, page 64, propose to use this pattern for converting chalk to lime. The context suggests 2 grams of chalk heated for about one hour. Griffin's "Chemical Handicraft," page 121, contains particulars of *extemporaneous fireclay-furnaces* to be built up in sections on an ordinary tripod and used over an ordinary Bunsen, price

about 4s. Messrs. Griffin also write: "For a simple furnace-body cheaper than No. 1,201, which would fit into an ordinary laboratory tripod-stand for heating Berlin porcelain crucibles No. 0 to bright redness. For this purpose we would refer you to our CRUCIBLE JACKETS OF PLUMBAGO. These are similar to a plumbago crucible, only having a wide flange on top to catch in an ordinary retort-stand. They are used in pairs, one being inverted on the other," price 2s. 6d. per pair. The Morgan Crucible Company write recommending their SALAMANDER JACKETS supplied to order either direct or through Messrs. Harris and Co. (No. 2,037). These jackets deserve more attention than they have yet received.

The classical experiment on the *composition of water* by passing hydrogen over hot copper oxide seldom gives accurate results in the hands of boys, and yet it is too important to omit. The mere exhibition of it on the lecture table fails to rivet it into the minds of the class. For an elementary class I would suggest that, after full discussion of the experiment in the lecture room, they should next learn to manipulate it in the laboratory; that no weighings should be taken; but that every boy should make a very careful drawing of the apparatus, which forms an excellent model for a diagram drawing extending across two whole pages of the notebook. The laboratory work may be organised in groups of eight boys, each pair being responsible for one quarter of the combined apparatus. Two dozen boys will then get everything ready for three experiments in about half an hour. As soon as each boy's share is ready he can begin his drawing, working in pencil at first, to ink it in afterwards in preparation. The whole class being now quietly employed, the master has leisure to go round and inspect. When all connections are satisfactory, the experiments are started in stages—the hydrogen currents started, the issuing gas tested, the combustion tubes heated—each stage being inspected and passed by the master before the next is begun. Only one pair of boys need attend to their experiment at each stage; the bulk of the class are still employed with the drawing. After everyone has seen the formation of red copper and water dripping into the little test-tube within the U-tube, the gas flames are turned out, the arrangement disconnected into its original quarters, and everything put away. Organised like this, the experiment fits nicely into an hour-and-a-half laboratory lesson. If the copper oxide lies bare in the combustion tube, two or three Bunsens will be amply sufficient to heat it, or a *Ramsay burner* (Baird & Tatlock, No. 1,373, and Harris, No. 1,466) may be used. Boys who want to do the experiment gravimetrically in their own time may be supplied with a Kipp's hydrogen apparatus, good granulated copper oxide, a *porcelain boat*, and a 6-inch section of Fletcher's combustion furnace described below.

Beginners sometimes confuse the last experiment with the preparation of hydrogen by passing *steam over iron filings*. Another hour spent on a

careful diagram will impress the difference. The Ramsay burner and glass tube suggested in a recent text-book seem hardly adequate: more brilliant success will be obtained with a furnace and temperature above the softening point of hard glass. Iron tube is used—two feet length of gas piping, three-quarter inch clear inside, and with the rag of the inside ends filed off clean. As iron



Fletcher's Combustion Furnace for Organic Analysis.
(No. 2 Pattern.)

is a conductor, the heat softens rubber corks, but not asbestos corks; however, wooden corks do nicely. If the filings are rusty or greasy, they may be cleaned whilst in the tube by heating in a current of coal gas. Within the tube they must be pushed well to the middle, and yet allow a free passage of gas. For success in this experiment the tube must be at a bright-red heat. A furnace is essential. Fletcher's COMBUSTION FURNACE FOR ORGANIC ANALYSIS, No. 2 pattern, 12 inches long, price 48s., is very satisfactory. The well-known HOFFMANN pattern, 12 stopcocks, 36 perforated clay-burners, price £4, gives ample heat, but does not carry a broad tube so easily. A quarter of an hour is required for heating the tube. In the meantime a flask of boiling water should be ready with steam issuing from the rubber tube. Lastly, the rubber is connected to the iron tube and hydrogen comes at once in a rapid current. The furnace described above is in 6-inch sections, from which any multiple length may be built up. The fire-clay arches are fragile, but useful even when broken. These and other broken parts of

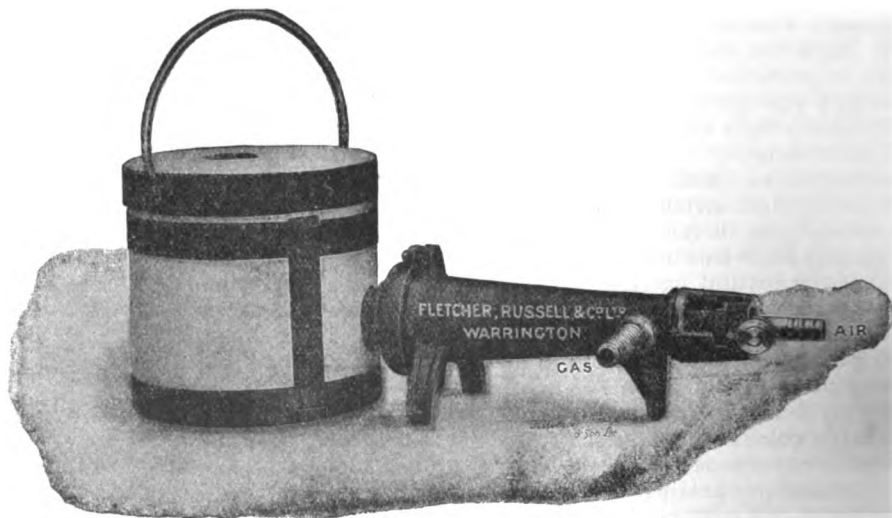
laboratory furnaces may be repaired with *plastic firebrick*, made by mixing liquid silicate of soda with ordinary fireclay to the required consistency.

For an upper class which has seen furnaces before, the delay in heating may be tedious. A higher temperature is obtained in less time by forced draught from a foot bellows with Fletcher's COMBUSTION FURNACE, No. 1, 24 inches long, price 50s. This is a very effective instrument. As watched by the writer in Messrs. Fletcher's laboratory, the iron gutter became red hot in thirty seconds, and the whole inside of the furnace was at a bright glow in two minutes. Exact instructions necessary to the working of this furnace are given in the catalogues, and need not be quoted here. The brittle cast-iron metal requires care. If broken the separate parts can be replaced.

Messrs. Reynolds and Branson write to recommend a combustion-tube furnace for heating a long row of small crucibles. They could supply one with thirty-six burners for £4. Access to any crucible could be obtained by lifting the tile above it.

For high-temperature experiments in fire-clay crucibles another class of furnace is used, in shape a square or cylindrical fire-clay box, into which some sort of a blow-pipe blast is driven. The automatic jet already described will do, but special burners are recommended. Such is Fletcher's NEW PATENT (1900) INJECTOR FURNACE. The small size, No. 1, price 14s. 6d., carries crucibles two and a-half inches high, and works with No. 3 foot-bellows.

A modification of this is the LECTURE FURNACE, price 37s. 6d. Its advantages are that it will stand

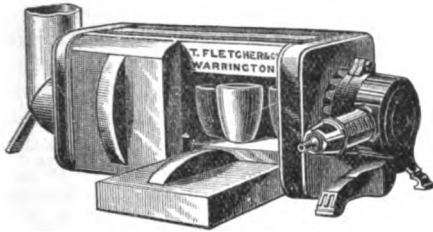


Fletcher's New Patent (1900) Injector Furnace.

sideways, so that the red-hot crucible can be seen by the audience, and being less noisy than the injector furnace, it is just possible for a lecturer with a good voice to make himself heard against it. It is very rapid, a crucible becoming bright red in two minutes.

A larger furnace opening sideways is Fletcher's

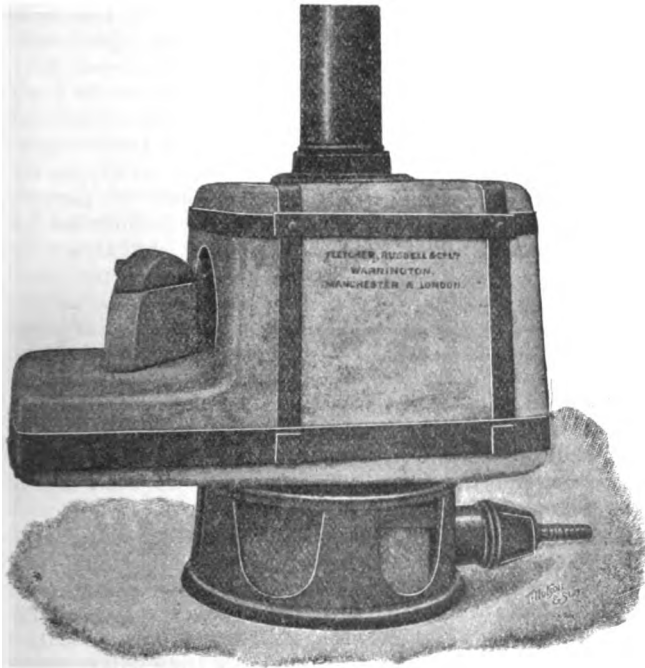
REVERBERATORY GAS-FURNACE, 6 H, price 90s. The inside space, 14 inches long, 6 inches wide and 7½ inches high, will carry a few large crucibles, or two muffles, or a dozen small crucibles or cupsels.



Fletcher's Reverberatory Gas Furnace.

Working with a chimney for draught, the inside was well heated in 15 minutes. A blast burner can be supplied at an extra cost of 10s. 6d. The side opening allows of easy inspection; but, of course, opening a furnace to see whether it is getting hot is rather like pulling up seeds to see whether they are growing. Mr. S. H. Davies, B.Sc., who used this pattern at the Battersea Polytechnic, tells me that he can strongly recommend it for work with boys.

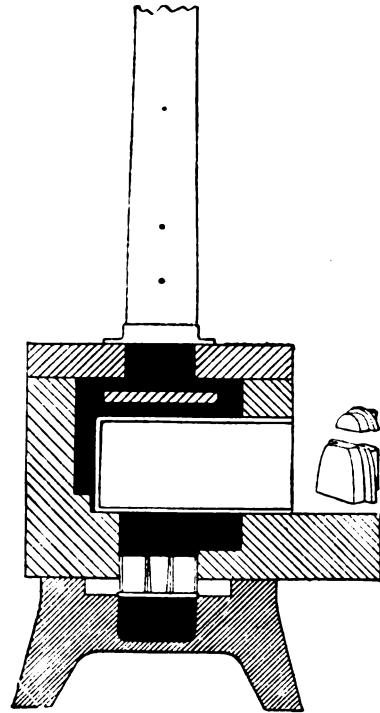
Lastly, we come to MUFFLE FURNACES, that is, furnaces adapted for heating an inner "muffle" within the protection of which a number of crucibles may be heated. The muffle is a fire-clay box, arched at the top and open at one end, in shape like the body of a baker's van. They are made in various sizes, e.g., 6½ inches long, 3⅞ inches wide, and 3 inches high, price 1s. 9d. each, fitting the



Fletcher's Muffle Furnace.

furnace next described. The muffle not only keeps its contents warm, but also protects them from

furnace gases. A disadvantage of muffles for school use is that it is difficult to pack in a number



Griffin's Muffle Furnace.

of crucibles without spilling their contents. Furnaces to contain muffles will work either by draught or blast. Fletcher's No. 461, price 50s., seems the size adapted to schools. This pattern and size has been supplied to the London School Board. With draught the muffle heats in about one quarter of an hour. For blast the blower recommended is the larger size, 96, No. 5, 36s. 6d. Messrs. Griffin also send particulars of muffle furnaces. The advantage of their makes is in the large radial burners which may be adapted to different furnaces; e.g., vertical burner, No. 2, price 18s., may be used either (1) with a clay-crucible support which will drop into the centre of the burner, or (2) with a draught muffle-furnace, or (3) with a draught crucible-furnace. But on the whole the muffle-furnaces seem most useful for the technical laboratories of factories where work is going on all day long, but are less adapted to the conditions of a school laboratory where classes come and go at short intervals.

Goldoni, La Locandiera. Edited by J. Geddes and F. M. Josselyn. vii. + 114 pp. (Heath.) 1s. 6d.—The bright and amusing little play, in which Duse was seen to great advantage some years ago, has been suitably edited by the Professor and Assistant-Professor of Romance Languages in Boston University. They have supplied a short biographical introduction, good notes, and a vocabulary which seems to be complete.

A HOLIDAY TRIP IN NORTH ITALY.

By DE V. PAYEN-PAYNE.

Principal of Kensington Coaching College.

WE presume there are few educated men, and still fewer teachers, who have not desired to visit Italy. Those who have not ventured on the trip have been deterred, no doubt, either by the cost, or the extremes of climate, or by ignorance of the language, and even some, perhaps, by fear of brigands. After spending several holidays in England, France, and Germany, it occurred to us that perhaps we were wasting the best years of our life in becoming acquainted with cities not quite the best; while for the same expenditure we might be visiting those places that all men agree are unsurpassed, and in reading about which we had spent quite a large proportion of our working hours.

Teachers, like men of other professions, have different ideas on the proper way of spending holidays. But if the greatest amount of good is to be got out of a foreign trip, it should be planned out most minutely beforehand. It need hardly be said that a companion of like tastes is almost indispensable for the full enjoyment of such a holiday. A weekly meeting for two or three months prior to the start is a welcome break during the woes of winter. The route has to be arranged, the hotels selected, a list of the important sights of each town to be made out, with the approximate time to be devoted to each, and books to be read which bear upon the country in question. In the case of North Italy, "Baedeker" (Dulau, 8s.) must be in everyone's pocket, if only for the practical, everyday details. For a general review of an Italian trip, Grant Allen's "European Tour" (Grant Richards, 6s.) is most illuminating; and his "Venice," and Dr. Williamson's "Cities of North Italy" in the Historical Guides Series (Grant Richards, 3s. 6d. net each), are quite unique in teaching a tourist how he should set about studying a foreign town. Some knowledge of the language is most useful, although a traveller *can* get on with French; but he who knows English only must be prepared to spend more. For all practical purposes a few weeks' study of a popular Italian manual, with half-a-dozen *viva-voce* lessons, is quite sufficient to enable one to tackle waiters, porters, and vergers, not to mention the inevitable beggar. In the opposite jacket pocket to the one in which he carries his Baedeker, the traveller had better place one of Nutt's "Conversation Dictionaries" (D. Nutt, 2s. 6d.); they are quite different from the usual conversation manual. To one who knows French, it is wonderful how quickly one improves in this beautiful language. Some knowledge of Italian history is useful, as the doings of the several small Italian states are apt to be confusing. Here Hunt's little compendium in Macmillan's "Historical Course for Schools" (Macmillan, 3s.) is brief enough. To one interested in architecture, reference might be

made to Fergusson's work; while Kügler's "Italian Schools of Painting" (Murray, 30s.), and Mrs. Jameson's "Sacred and Legendary Art," and "Legends of the Madonna" (Longmans, 20s. and 10s.), may be recommended to the amateur in painting. On the latter art, with which a trip to Italy is so bound up, a useful little handbook to be taken in one's bag is Poynter's "Classical and Italian Painting," one of Low's Art Handbooks (Sampson Low, 3s. 6d.). Other books that may be read are Freeman's "Historical and Architectural Sketches" (Macmillan, 10s. 6d., out of print and somewhat scarce)—not to be confused with the companion work, "Subject and Neighbour Lands of Venice," which deals mainly with Dalmatia; J. Addington Symonds' "Italian Sketches" (Smith, Elder, 9s., or can be obtained in the Tauchnitz series for 2 frs.); W. D. Howells' "Venetian Life" (Tauchnitz, 2 frs.); Théophile Gautier's "Italia" (Charpentier, 3 fr. 50 c.); and Taine's "Voyage en Italie" (Hachette, 2 vols., 3 fr. 50 c. each). Augustus Hare's "Cities of Northern Italy" (Allen, 2 vols., 21s.) is mainly useful for its quotations.

Having soaked their minds in some of these materials, the tourists will next set about determining their route. And here Grant Allen is to be followed implicitly. Mont Cenis he calls the back door into Italy; and the right way of approaching it, if walking or bicycling over one of the passes is ruled out, is by the St. Gothard route. A return second-class ticket from Dover to Bellinzona should be obtained from the Belgian State Railways. This will cost £5 14s., and seasoned travellers, by starting from London at 5.30 p.m. may reach Locarno, on Lake Maggiore, at nine the next evening. But many tourists find that continuous travelling for over twenty-four hours is apt to destroy the pleasure and value of an entire trip; these we advise to break their journey at Strassburg or Brussels. There are three trains daily from Ostend to Milan, and it is easy to go on by the next; it should be arranged that the part of the journey between Luzern and Bellinzona be undertaken in daylight, especially by those to whom Swiss scenery is only known from pictures. The meals on the Gothardbahn are excellent, although expensive, and it is better to have *déjeuner* on board than trust to picnicing. If there is time the train may be left at Luzern, and rejoined at Fluellen, after a trip down the lake on one of the steamers. After a good night's rest at Locarno, the tourists will be able to appreciate the Italian lakes for the next two days; and as their sight-seeing will be of a very mild character, they will have time to recover from the labours of the term before starting on Italy proper. About ten shillings will take the tourists from Locarno to Luino, and on, partly by boat, and partly by cog railway, to Lugano, Bellagio, and Como. If the travellers have fine weather here, they will want to spend their whole holiday amongst this beautiful scenery. Unfortunately it is very wet, with that particularly penetrating mist of mountain climates. But they must recollect that the serious part

of their trip is before them, and tear themselves away after two or three days. From Como they should go straight to Milan, and there obtain a circular ticket, including all the towns they wish to visit. These tickets are extremely cheap, and quite a prolonged tour need not cost more than two or three pounds, second class.

Now will come the momentous question of what towns shall be visited. Certainly the five given in Dr. Williamson's book, *i.e.*, Milan, Verona, Padua, Ravenna, and Bologna—*plus*, of course, Venice. If three or four weeks only is to be given to the trip—and few teachers will be able to give more from lack of time, and often, of pence—we should suggest that their energies be confined to these. Ravenna is the most difficult to reach, but it should on no account be neglected; it illustrates an uncommon period of history and art that can be studied nowhere else. But many will exclaim against passing through many interesting towns, and yet not stopping at them. If other halts are made, Bergamo, Vicenza, and Parma are most worthy of the traveller's attention, and a day in each will be enjoyed. Brescia, Modena, and Ferrara are less interesting, while Mantua is certainly not worth the *détour*. But all these are extras, and it is far better to concentrate one's energies on the essentials than to scatter them on the second-rate.

Now as to time. Three days is a minimum for Milan, with an extra day for the Certosa di Pavia, which is quite first-class; Verona also needs three days, Padua two, Venice at least a week; Ravenna cannot be done under two days, nor can Bologna. Thus, counting two days for the journey out and home, the five essential towns and Venice can be done fairly in three weeks; any other towns could hardly be got into an Easter holiday. For Easter will be the period of the year that most teachers will devote to such a trip. Only in exceptional years is the weather at all hot at this time, and an overcoat will be needed in the evening. Venice, however, is quite tolerable in September, and for those who do not dislike heat, the summer holidays afford the opportunity of a longer stay. If the most is to be made of the least time, early breakfast should be taken in one's hotel, lunch at any *trattoria* where one happens to be, as much time is often wasted in returning to one's hotel in the middle of the day. North Italy, however, will be found to retain many traces of the Austrian occupation. At many hotels the chief meal takes place at mid-day, and late dinner is an exception.

As to cost: Three weeks should not cost more than £25. As has been mentioned, the travelling can easily be kept under £10. Board and lodging at one of Baedeker's asterisked second-class hotels ought not to exceed eight *lire* a day; so for incidentals the travellers should have £7 or £8 in hand. It is needless to add that the traveller should eat and drink according to the customs of the country, if he is to keep well, and he should become acquainted with at least some of the hundred-and-one methods of cooking macaroni

of all sizes. A final word as to luggage: None but hand luggage is allowed free on Italian railways, and much valuable time is wasted on the formalities of booking large trunks. The traveller who limits his luggage to a Gladstone, that can be stowed in the rack, saves much money and time and does not lose his temper. Consequently he enjoys his holiday more.

NEW REGULATIONS OF THE IRISH INTERMEDIATE EDUCATION BOARD.

THE Rules and Programme for 1903 were published in May, and contain many changes.

As these tend to remove many of the difficulties in the rules and programme for 1902, they will be certain to meet with general approval. It will be convenient to point out first the alterations, and then to offer one or two criticisms.

In the subjects of examination there are two or three important alterations. Music disappears altogether, and Drawing may no longer be taken as a separate subject in the Preparatory or Junior Grades. Arithmetic is reinstated in the Senior Grade, and appears as a joint subject with Algebra. But the most important change is in the re-modelling of the two English subjects. Instead of English Composition, and English including Literature, History and Geography, we have English Composition and Literature as one subject, and History and Geography as another. Some change was inevitable. The home-reading course of the 1902 programme was proved impracticable, and has therefore been abandoned. A moderate amount of literature counting 25 per cent. of the paper has been added to the course for English Composition, and History of Literature has been omitted. To the English and Irish History and Geography of the former programme is added some general European History. The mathematical subjects have been slightly modified, extended in some cases, lessened in others. The division of Pass and Honour subjects remains as before.

The conditions of passing continue the same as regards the number of subjects, five in the Preparatory and six in the other grades, but instead of two pass courses and three honour groups for the higher grades, there will be four distinct Pass and Honour courses: (i.) the Classical, (ii.) the Modern Literary, (iii.) the Mathematical, and (iv.) the Experimental Science. The compulsory subjects in each of these are as follows:—(i.) The Classical: English Composition and Literature, Latin, Greek, and one mathematical subject. (ii.) The Modern Literary: English Composition and Literature, two modern languages, one mathematical subject, and either Latin or Experimental Science and Drawing. (iii.) The Mathematical: English Composition and Literature, three mathematical subjects, and either Latin or Experimental Science or Drawing. (iv.) The Experimental Science: English Composition and Literature,

Experimental Science and Drawing, one mathematical subject, and either French or German. In the Senior Grade Classical and Modern Literary Courses Mathematics are made optional for girls. There will be no competition between these courses, but to obtain exhibitions it will be necessary to obtain honours in the Classical Group in Greek and Latin; in the Modern Literary, in two of the following—French, German, Irish and Latin; in the Mathematical, in two mathematical subjects; and in the Experimental Science, in Experimental Science and Drawing, and one mathematical subject or French or German. The pass standard on the pass papers remains the same, but the honour standard is reduced from 50 to 35 per cent. in the mathematical subjects, and the pass standard on the corresponding honour papers to 20 per cent. The Board also secure themselves from any breakdown of the examination by reserving the power to lower the percentage of pass, not only for future years, but also in the present year.

The method of awarding the school grant is entirely changed. A partial return to the old system has taken place. A capitation grant will be made for each student that passes, and this will be increased in the case of honour students. The figure thus obtained for each school will be called the normal school grant; this may be increased, if the inspector reports the school as satisfactory, by 10 per cent; if highly satisfactory, by 20 per cent. This system of grants is sure to be severely criticised, although an improvement on the old method of paying so much for every hundred marks obtained by each pupil. It is difficult, however, to find an adequate solution of the problem set to the Board, viz., to apportion a limited sum of money fairly among all the schools. A proper system would allow the Board a sum which would be sufficient to endow every Irish school satisfactorily. This is at present a dream, we fear, of the distant future.

And now for one or two criticisms. The mathematical courses can hardly be considered satisfactory, as no language but English is compulsory. No secondary-school curriculum is complete without at least one foreign language. It is difficult to understand why Experimental Science and Drawing are linked together as one subject throughout all the grades. As some drawing is necessary for the study of experimental science, it would be more satisfactory to make it obligatory on all students of experimental science to reach a certain proficiency in drawing, and then to leave them free to continue drawing or not, as they wish. Drawing, apart from the amount requisite for Experimental Science, should constitute throughout a separate subject. So far, however, from this being the case, Drawing is not to be a separate subject at all, except in the Middle and Senior Grades. In fact, the art side of school teaching is very hardly hit by the new programme, as besides this treatment of Drawing, Music is omitted altogether. This brings us to a very serious point. The two years, 1901-2, 1902-3, have seen actually or practically abolished four subjects which were favourite

ones in most girls' schools: Botany, Domestic Economy, Music, and Drawing. Girls' schools have in this a very just cause of complaint. Their programmes have been entirely revolutionised; none of the subjects which differentiated them from boys' schools have been left to them, nor can it be said that any one of the four courses is more suitable for girls than for boys. In fact, the education of boys and girls is put upon an absolute equality. Finally, we see in these new Rules no attempt to improve the position of the teacher or of teaching as a profession. While in England registration is an accomplished fact, and while the Department of Technical Instruction insist on certain qualifications for the teachers of science, the Intermediate Board do nothing, and yet the teacher is the keystone of the arch.

THE REPORT OF THE MATHEMATICAL ASSOCIATION ON THE TEACHING OF GEOMETRY.

By A. W. SIDDONS, M.A.

Assistant Master at Harrow School, Hon. Sec. of the Mathematical Association Committee.

THE Mathematical Association is a body peculiarly well fitted to consider that burning question, the teaching of elementary mathematics. Originally founded to improve the teaching of geometry, the Association has always numbered many mathematical masters among its members; to-day it probably represents the views of the Public Schools better than any other body. From the list given below, it will be seen that nearly all the big Public Schools within easy reach of London are represented on the Committee which the Association has appointed to report on the teaching of mathematics:—

MEMBERS OF THE COMMITTEE.—Mr. J. Fletcher Moulton: Profs. M. J. M. Hill (University College), W. H. H. Hudson (King's College), A. Lodge (R.I.E.C., Cooper's Hill), G. M. Minchin (R.I.E.C., Cooper's Hill), Messrs. W. M. Baker (Cheltenham College), S. Barnard (Rugby School), H. D. Drury (Marlborough College), J. M. Dyer (Eton College), T. J. Garstang (Bedales School, Petersfield), H. T. Gerrans (Secretary of the Oxford Local Examinations Delegacy), C. Godfrey (Winchester College), W. J. Greenstreet (Marling School, Stroud), C. Hawkins (Haileybury College), F. W. Hill (City of London School), R. W. Hogg (Christ's Hospital), H. T. Holmes (Merchant Taylors' School), E. M. Langley (Bedford Modern School), C. C. Lynam (Oxford Preparatory School), C. Pendlebury (St. Paul's School), H. C. Playne (Clifton College), W. N. Roseveare (Harrow School), C. A. Rumsey (Dulwich College), S. A. Saunder (Wellington College), H. A. Saunders (Haileybury College), E. C. Sherwood (Westminster School), A. W. Siddons (Harrow School, Hon. Sec. of the Committee), C. O. Tuckey (Charterhouse School), E. T. Whittaker (Trinity College, Cambridge), and Dr. F. S. Macaulay (St. Paul's School).

There is a general feeling in England that the school curriculum is bound by examinations, and that at present the course which we are compelled

to pursue is far from the ideal. This Committee has tried to draw up a list of practical suggestions which might be adopted at once, provided examiners would make the necessary changes in their schedules. If examining bodies find that the Public Schools are in agreement, there is every chance of these changes being made; but it is obvious that this agreement can only be obtained if the reforms suggested are moderate in character and easily adaptable. It has therefore been the object of this Committee to propose moderate, though none the less important, reforms.

The Report has been sent to all the schools mentioned in the "Public Schools Year Book," and is published in the May number of the *Mathematical Gazette*. Criticism, favourable or unfavourable, will be welcomed by the Committee, and will be carefully considered before the Report (in a modified form if needs be) is presented to the principal examining bodies.

Before considering the proposals, it is interesting to note that the Oxford Local Regulations¹ for 1903 go even further than the Committee dared to suggest; the Cambridge Local Examinations Syndicate² is, we believe, considering the question, and the Civil Service Commissioners have for some time set an excellent example in the Army and Navy entrance examination papers.

It may be considered that many of the suggestions are too obvious to be worthy of mention: for instance:—

It is desirable that a first introduction to geometry should not be formal, but experimental, with use of instruments and numerical measurements and calculations.

This is almost a platitude, but nevertheless the advice is only followed in very few preparatory or public schools, the reason, no doubt, being that it seems not to pay; very few examiners have set questions on this work in the past. But even though it may not pay directly, it would certainly pay in the long run; but the Report goes on to suggest that Public School Entrance, University, and other examinations should recognise the value of this work and encourage it by setting questions on it. There is no doubt that many schoolmasters do not regard the work with favour; they dread the mechanical and mere memory work of geometrical drawing, as geometrical drawing is so often taught; but deductive geometry is helped by a good eye, and a clear understanding of the terms used is essential; failure in deductive geometry, both in doing riders and understanding propositions, is in most cases due to a lack of knowledge of geometrical facts, and it is just here that practical work is a great help.

A well thought-out course of this work prepares the mind for deductive geometry before the pupil

is old enough to begin the stricter study. But such work should not be merely introductory; it should be continued right through the deductive course. The result of VI. 2, for example, is much more clearly understood if the lines are actually measured, and the ratio worked out to two or three significant figures. Quite lately I personally have even found it a help, in beginning inversion with advanced pupils, to invert a circle by carefully plotting out the inverses of a series of points on the circle.

So much for the experimental course; now for the formal course.

Since pupils will have been already familiarised with the principal constructions of Euclid before they begin their study of formal geometry, it is desirable that the course of constructions should be regarded as quite distinct from the course of theorems. The two courses will probably be studied side by side, but great freedom should be allowed to the teacher as to the order in which he takes the different constructions.

This division into two parallel courses has already been adopted on the continent and is followed in the A.I.G.T. geometry.

The Committee propose, with a view to making the course of theorems independent of methods of construction, that no proof of a theorem should be considered invalid by reason of an assumption that a line or angle may be divided into any number of equal parts or that a line may be drawn from any point in any assigned direction and of any assigned length, or that any figure may be duplicated or placed in any position.

Without sacrificing rigidity, such assumptions would undoubtedly simplify the proofs of many theorems. For example, an easy proof of I. 5 by I. 4 can be given if we assume the necessary existence of a bisector to every angle (which is very different from assuming that we know how to construct that bisector).

It will probably be a disappointment to many that the Committee consider it wise for the present to retain "Euclid's logical order." Most teachers feel that a standard order is essential in England, because boys are constantly passing from master to master, besides passing from preparatory to public school, and also because of our system of examinations. (The Oxford Local Authorities and the Civil Service Commission do not seem to consider the latter reason to be of any weight.) What this standard order should be is very open to question, and the proposal of such an order might have entirely wrecked the unanimous approval which it is hoped will be accorded to this Report. Further than that, the standard order has not yet been sufficiently discussed. Professor Lodge has proposed¹ an order for the theorems in the first 32 propositions of Euclid, Book I., and of course there are the A.I.G.T. geometry and other books, both foreign and English; but very few of these have been properly considered, except by a small minority of the mathematical teachers of this country. When the matter has been fully discussed, if a standard order is really necessary, the Mathematical Association would be a most suitable

¹ Extract from the Regulations.—"Questions will be set so as to bring out as far as possible a knowledge of the principles of geometry, a smaller proportion than heretofore consisting of propositions as enunciated in Euclid. Any solution which shows an accurate method of geometrical reasoning will be accepted. No question will be set involving necessarily the use of angles greater than two right angles."

² Geometrical proofs of the *theorems* in Book II. will not be insisted on.
³ It is reported that the Syndicate has appointed a special committee, including the Master of Sidney Sussex, Prof. Forsyth, Dr. Hobson, and Prof. Ewing, to consider the regulations relating to mathematics.

¹ *Nature*, April 10th, 1902.

body to draw it up. But this is looking into the future; suffice it to say that for the present—

It is not proposed to interfere with the logical order of Euclid's series of theorems—in other words, it is not proposed to introduce any order of theorems that would render invalid Euclid's proof of any proposition.

But in order to give as much freedom as possible, subject to this restriction, the Report recommends that—

As far as possible, proofs of theorems should be based on first principles, and long chains of dependent propositions should be avoided.

And also, that—

Proof of *congruence* by superposition, and, in particular, proof of *symmetry* about a line by folding, should be considered fundamental methods of proof.

The following clause is important :—

In pass examinations it is desirable that the system should be gradually introduced of requiring that a candidate, in order to secure a pass, should evince some power besides that of being able to write out bookwork.

A boy who can write out propositions in perfect style, but cannot do riders, can hardly be said to have mastered the elementary principles of deductive geometry; and, unless he does many riders in the very early stages, he is so slow in grasping the later propositions that much time is lost—more than would be spent over such earlier riders. Examiners can do much to encourage the solution of riders, but the whole matter really rests with the teachers. No good can be done by cramming a few stock riders; but, on the other hand, if more time is devoted to teaching boys how to tackle them, the results will be beneficial in every way. This, no doubt, is fully recognised by mathematicians; but it must not be forgotten that in many schools, especially preparatory schools, geometry is taught by men who have had no special mathematical training.

The Committee propose the omission of many of Euclid's propositions, partly in order that more time may be left for the teaching of riders and practical work with instruments, leading up to future propositions, and partly because there are many propositions which are unnecessary and of little interest, or the logical value of which is understood by very few—possibly by none until some years later.

The following is a complete list of the *theorems* which it is proposed to retain in the first three books :—

I.—4, 5, 6, 8, 13, 14, 15, 16, 17, 18, 19, 20, 21, 24, 25, 26, 27, 28, 29, 30, 32-41, 43, 47, 48.

II.—1-7, 12, 13.

III.—3, 7, 8, 9, 14, 15,¹ 20, 21, 22, 26, 27, 28, 29, 31, 32, 35, 36, 37.

As stated above, it was considered unwise to propose any definite detailed order at present, but it is suggested that Book II. should be taken after III. 32.

Under the head of Theorems in Book I., the following points, among others, are suggested :—

That 8 be proved by placing the triangles in opposition.

That proofs of 24 by 19, which are incomplete, should be amended; but that proof by 20 should be preferred.

That 26 be proved by superposition.

That, in connection with I., 4, 8, 26, the following proposition be introduced :—

Two right-angled triangles which have their hypotenuses equal, and one side of one equal to one side of the other, are congruent. (This can be proved by placing the triangles in opposition with their equal sides coincident, and applying I., 5 and 26.)

That the following propositions be introduced :—

(1) *The locus of points equidistant from two given points is the perpendicular bisector of the line joining the given points.*

(2) *The locus of points equidistant from two given intersecting straight lines is the pair of bisectors of the angles contained by the given lines.*

That Playfair's axiom is preferable to Euclid's 12th axiom.

That it should be proved (for commensurables) that the area of a parallelogram is measured by the product of the measures of its base and height, and the area of a triangle by half this product.

Book III.—It is suggested that there should be a preliminary discussion of some of the fundamental properties of the circle—the course sketched out in the Report would certainly render unnecessary in an ordinary school-course such propositions as 10, 11, 12, and 13, the interest of which is purely philosophical. It is also proposed—

That the "limit" definition of a tangent be allowed.

That 16, 18, 19, be replaced by the proposition, *The tangent at any point of a circle and the radius to the point of contact are at right angles to one another*: with the corollary, *One and only one tangent can be drawn at any point of a circle.*

That 26, 27, be stated as one proposition, and be proved by superposition, and that the equality of the sectors be proved as a corollary.

Book II.—The Report suggests :—

That the following definitions of a *rectangle* and a *square* be accepted :—

A *rectangle* is a parallelogram which has one of its angles a right angle.

A *square* is a rectangle which has two adjacent sides equal.

That those proofs are preferable which do not make use of the diagonal.

That illustration from algebra ought to be given where such is possible.

Book VI.—Here, again, the Report lays stress on the value of experimental work, and points out that "practical problems in heights and distances can be solved by quite young pupils, and are found most interesting exercises." Later on it says :—

In connection with the formal course, as soon as the proposition that equiangular triangles are similar has been proved, the sine, cosine, and tangent can be defined (if this has not been done earlier in the experimental course). In order to make the meanings and importance of these functions sink deeply into the pupil's mind, numerical examples should be given on right-angled triangles (heights and distances); these should be worked with the help of four-figure tables.

In this way the pupil will be at once taught to apply his deductive geometry, and thus interest will be added to the work. The Report suggests :—

¹ See below under Book III.

That an ordinary school-course should not be required to include incommensurables—in other words, that in such a course all magnitudes of the same kind should be treated as commensurable.

The treatment of incommensurables is thus to be postponed and regarded as a branch of higher mathematics; this is what is already done in most schools, I believe. None but the best school-boy mathematicians could ever appreciate the logic of Euclid's treatment of Books V. and VI.; many of those who read these books fail to grasp their beauty, and regard the work as a clever, though irksome, way of escaping a little algebra. Besides this, the Committee suggest:—

That, in the ordinary school-course, reciprocal proportion should be dropped and compounding replaced by multiplying.

That all statements of ratio may be made in fractional form, and the sign = used instead of ::

These three recommendations will remove much that is formidable in Book VI., and so will enable many boys to grasp the essential facts about similar figures which would otherwise be partly if not wholly obscured from them because of the difficulties in Euclid's treatment of ratio and proportion.

Two methods of proving VI. 1 are suggested. In the first proof a common measure of the two bases is taken; the second depends on a proposition suggested as an addition to Book I.¹

The adoption of the following proposition is proposed:—

If two triangles (or parallelograms) have one angle of the one equal to one angle of the other, their areas are proportional to the areas of the rectangles contained by the sides about the equal angles.

19 follows immediately in the form, *The areas of similar triangles are proportional to the squares on corresponding sides.*

20 can be deduced as in Euclid.

22 follows at once.

14, 15, 16, 17, 21, 23, 24, 26, 27, 28, 29, 32 should be omitted.

In the above we have noticed the more important of the Committee's suggestions. The whole Report "is the outcome of many meetings, and of prolonged deliberation on the more drastic of the changes proposed. It affords striking evidence, if any were needed, of the fact that mathematical teachers are neither unconscious of nor indifferent to the condition of things so forcibly depicted at the last meeting of the British Association. It is gratifying to note that the counsels of the Committee were on the whole pervaded by singular unanimity.

"Similar reports will shortly be issued on the teaching of Arithmetic and Algebra. The reports taken as a whole will represent a body of opinion which cannot be ignored, and should have a wholesome effect upon the future of mathematical teaching in this country."

A NEW FRENCH DICTIONARY.¹

It cannot be denied that there is something attractive about what this "Wordbook" claims to be: it is described on the title-page as "a dictionary with indication of pronunciation, etymologies, and dates of earliest appearance of French words in the language." When we look into the book more closely, we find that in the French-English part we have practically an abridgment of the well-known "Dictionnaire Général de la Langue Française" compiled by Hatzfeld, Darmesteter and Thomas. No better work could have been chosen as a basis; all that was required was to reduce it to convenient compass by making a judicious selection from the materials contained in that invaluable book, and to give good English renderings of the French explanations.

In order to convey some idea of the way in which the work has been carried out, it may be useful to set down a few typical instances. We happened to take the beginning of "F":

F: parler par B et par F, rendered "curse and swear" [should be "use foul language"].

Fabuleux: as "familiar" meanings are given "incredible, imaginary" [only the former is "familiar"].

Facon: one of the meanings given is "materials furnished to a workman" [an unjustifiable deduction from *travailler à façon*]; *je vais te servir d'un plat de ma façon* is translated, "I am going to do you a good turn." [H. D. T. quote this from Mol. *Étourdi*, II. 10, and render *te jouer un bon tour*, "play you a trick, show you what I can do"]; *en façon du monde*, rendered "not at all" [should have *ne*, as in the quotation in H. D. T.; but hardly worth admitting]; *sans façons*, "without any ado" [the more common *sans façon* is not mentioned, and the renderings "without ceremony, free and easy," are not given]; *point de façons* is marked as obsolete [it is quite common; H. D. T. single out some special uses of it as *vieilli*]; the expression *ne faites pas de façons* is not given.

Falloir: comme il faut "as is proper" [the only rendering given]; *peu s'en faut*, "there is little lacking" [the obvious "very nearly" is not given].

Let us turn to the English-French part; we chance upon page 713. Here we notice the words "bedevil, bedewy, bedismal, bedye, befortune," which are surely out of place in a dictionary where so much important matter is omitted. There are three mistakes in spelling: *engraisser* (for *engraisser*), *au gardes* (for *aux gardes*), and "befuddled" (for "befuddled"—at least the rendering *fou du violon* and the place (before "befit") suggest this queer word). The French for "roast beef" is not given; "beerhouse" is rendered *taverne* (no mention of *brasserie*); *déjà* is not given among the renderings of "before," nor *avant de* with infinitive; under "beg" we search in vain for "to beg pardon." (On turning to "pardon," we find "to ask anyone [*sic*] pardon.") This leads us to look up some other common phrases, and we fail to find these (taken quite at random):

¹ "The French and English Wordbook." By H. Edgren, Ph.D., and P. B. Burnet, M.A., with an Explanatory Preface by R. J. Lloyd, D.Lit., M.A. (Heinemann.) 1902.

¹ Last paragraph in Book I. above.

"to drive a bargain"—"to drive to despair"—"to draw the line at"—"to draw (a person) out"—"to drop a letter, a word or two"—"to drink up"—"to drink out of a glass." On comparing our old friends Tarver and Gasc, we are struck by the great superiority of these books, as far as the store of idioms and the translations are concerned.

We have said enough to show that in this respect the "Wordbook" is wanting. Nor is the student of philology likely to prefer this book to the handy little volume by Laurent and Richardot or the fuller details in H. D. T. The addition of the date of first appearance may at first sight seem a convenience; yet in many cases it is deceptive, for the majority of words that can be dated are *mots savants*, and it often happens that these were coined in one century, but not generally used, and then reinvented two or three centuries later, when they really became part of the language.

Can the book be regarded as a convenient pronouncing dictionary of French and English? The compilers have had the assistance of Dr. R. J. Lloyd, one of our leading phoneticians. He has supplied a brief yet very valuable account of French and English pronunciation; but he has accepted—we do not believe he devised—a system of representing the sounds which is altogether unfortunate. The objection he raises to a re-spelling of the words in phonetic transcript (such as that of the *Association Phonétique Internationale*) is quite unsound: he maintains that it gives the student two forms of the word to remember instead of one. If this were true, it would apply with almost equal force to the method of indicating the pronunciation which he prefers; for instance, if an English word contained an *s*, the French student would have to remember with which of four different signs it is printed in the book, viz., simple *s*, or *s* with a dot under it, or *s* with a straight line under it, or *s* with a curved line under it. But, as a matter of fact, Dr. Lloyd seems to be leaving out of account the difference between what (for want of a better term) we may call the eye picture and the ear picture, the written and the spoken form of the word. It is not a question of learning off two eye-pictures, one representing the written, the other the spoken form; but rather the written form is learnt and, at the same time, the sounds that are associated with it. The use of a pronouncing dictionary is simply to correct what is faulty, and to give help where the speaker is doubtful.

Believing, then, that the objection to the use of the AF alphabet falls to the ground, we regret that it was not adopted in this dictionary. Nothing is more hostile to the spreading of sound views on phonetics than the multiplication of alphabets and other methods of indicating the pronunciation. What the compilers should have given us was the Michaëlis-Passy dictionary "the other way round," *i.e.*, the phonetic form after the conventional; they have missed a great opportunity.

We have not space here to show the undoubted ingenuity of this attempt, nor to discuss its weak

points, for such we consider, for instance, the fact that the same diacritics are used to represent (a) the sound of *o* in French *repos* and that of *o* in English *into*, and (b) the sound of *a* in French *pas* and the first vowel in English *laudation*. We also miss a clear statement of the salient differences between Northern and Southern English.

It is in no spirit of carping criticism that we make these remarks; it is rather in sorrow at seeing a happy thought inadequately carried out. As a dictionary of the two languages the book is no better than many others and inferior to several; it is not full enough to be of use as an etymological dictionary; it is inconvenient as a pronouncing dictionary. Even with the get-up we are not altogether satisfied. The printing certainly is good, but the outside is ugly. For some reason or other, the edges are half blue and half red; this has no practical value, for blue does not necessarily mean "French-English," nor red "English-French." If these words had been printed across the edges, it would have served a useful purpose, and been less offensive to the eye.

THE ENCYCLOPÆDIA BRITANNICA.¹

EVEN if it were possible to give in these columns an adequate notice of the many important articles in these two new volumes of the "Encyclopædia Britannica," such a detailed notice is unnecessary. The work is in every respect an impressive literary monument, almost every detail of which will bear critical examination.

As everyone knows, the ninth edition, which may be said to have brought to a focus the knowledge existing about twenty years ago, has within the past year or two found its way into libraries and households which formerly could not aspire to the dignity of possessing it. The twenty-four volumes which thus carried the torch of learning into new places are to be supplemented by others (like the two under notice) which, to pursue the hyperbole, will extend the area of enlightenment. The whole work will thus present a comprehensive and essentially complete view of the position of human knowledge at the beginning of the twentieth century.

Instead of attempting to describe the contents of the two new volumes of this supplement to the "Encyclopædia"—the definite article is merited—we recommend the reader to send for a copy of the large pamphlet containing specimen pages and details as to the contents and contributors. Here we will only remark that among the subjects dealt with in the two volumes which have been published are: all geographical divisions and places having names between Aachen and Chicacole, Biographies from Aasen to Chevreul, Accumulators, Acetylene,

¹The Encyclopædia Britannica. Edited by Sir D. M. Wallace, K.C.L.E., K.C.V.O.; Dr. A. T. Hadley, President of Yale University; and Hugh Chisholm, B.A. Vol. XXV. A—Aus. xi. + 808 pp. Vol. XXVI. Aus—CIII. xxii. + 763 pp. (Black. Also *The Times*.)

Æther, Algæ, Algebra, Algebraic Forms, Alloys, Aluminium, Amphibia, Anatomy, Archæology (Classical), Argon, Art-teaching and Arts and Crafts, Atmospheric Electricity, Bacteriology, Balloons, Birds, Boilers, Bridge, Bridges, Cancer, Chemistry, and Chess. Each of the articles is an authoritative statement upon the subject dealt with, many of them are excellently illustrated; and, where desirable, lists of standard works are given for the benefit of the inquirer who wishes to learn more than can be brought within the compass of a single article.

In conclusion, we wish only to remark that the habit of consulting standard works when interested in any subject is one of the best that can be cultivated. There is no work that responds so surely to the desire for information as the "Encyclopædia Britannica"; therefore it is an essential part of the equipment of a library of any pretensions, to be regarded as a monument to respect, a seer to consult, and a master key to the stores of human knowledge.

THE EDUCATION OF OFFICERS FOR THE ARMY.

FROM the very beginning of the South African war, the authorities have expressed themselves dissatisfied with both the general and technical education of officers, and it has been evident that their early training has not been conducted on proper lines. In April of last year a Committee (including Mr. Akers-Douglas, M.P., Sir Michael Foster, Dr. Warre and Mr. Walker) was appointed to consider what changes were desirable in training candidates for the Army, and whether the abolition or improvement of Woolwich and Sandhurst was advisable. After holding forty-one sittings and examining seventy-three witnesses, they issued their report on May 31st. Every one who has ever had to do with the education of candidates for the Army will most heartily approve of the conclusions at which the Committee have arrived.

So far as it touches the education of candidates before they enter Sandhurst or Woolwich, the report condemns the present entrance examination as too extensive; there is no adequate provision that the candidate is well grounded in such important subjects as English and mathematics, so that many officers cannot write a passable letter or draw up a report. They lack those habits of accuracy which are acquired by a thorough training in elementary mathematics. The counting of every mark made puts a premium on the mere temporary acquisition of unassimilated knowledge, and the training in the mother tongue is by no means as thorough as it should be.

The Committee therefore recommend that the future regulations for entrance to Sandhurst and Woolwich should be as follows:—

I. The limits of age should be 17 and 19 for Woolwich, and the same for Sandhurst, if a two years' course is made compulsory. If the course at Sandhurst be only eighteen months, the limits should be 17½ and 19½.

II. The subjects of examination should be as follows:—

CLASS I.

	Marks
(1) <i>English</i> .—Composition, <i>Præcis</i> , Outlines of English History and General Geography	3,000
(2) <i>Mathematics I</i> .—Including Arithmetic (especially contracted methods), Elementary Mensuration, Geometrical Drawing (including use of the Marquois Scales), Plane Geometry, Algebra (including surds), Elementary Trigonometry and Mechanics	3,000
(3) <i>French (or German)</i> .—Translation, Composition, Outlines of History and Geography	2,000
(4) <i>Latin</i> .—Translation, Composition, Outlines of Roman History and Geography... ..	2,000
(5) <i>Physics</i> .—Hydrostatics, Heat, Magnetism and Voltaic Electricity	2,000
(6) <i>Chemistry</i>	2,000

CLASS II.

(7) <i>Mathematics II</i> .—Part I.; Algebra (including binomial theorem), Solid Geometry, Higher Trigonometry, Statics and Dynamics	1,000
Part II.: Conics and Elements of the Calculus	1,000
(8) <i>German (or French)</i>	2,000
(9) <i>Greek</i>	2,000

III. All candidates must take up the first three subjects and one of the following three, and gain a certain minimum of marks in them.

IV. Woolwich candidates must also take up and gain a minimum in Mathematics II., Part I. They may take up in all six subjects.

V. Other candidates will not be allowed to take up more than five subjects.

VI. All candidates may take up Freehand Drawing as an extra voluntary subject, for which a maximum of 250 marks will be given.

The Committee agree in condemning the present type of modern-language papers, in which there is too great a tendency to encourage cram and superficial knowledge by setting catch questions in Grammar and Literature. This point has been urged in THE SCHOOL WORLD for some time past. They are also of opinion that the colloquial portion of the examination should be made more searching. In all the compulsory subjects in Class I., the Committee recommend that a qualifying standard should be maintained such as has been adopted by the Oxford and Cambridge Examination Board in their examinations for higher certificates.

Although the Committee are in favour of the retention of Woolwich and Sandhurst as military colleges, they recommend that both of them should be enlarged, and that the cadets should spend six weeks every summer in camp. The military instructors instead of being picked men are somewhat looked down upon by their colleagues. The military subjects are taught too much theoretically indoors, and not enough practically out of doors. There is also a general

lack of supervision, each professor being a law unto himself. They recommend, in order to remedy this bad state of things, that the senior instructors should be selected Staff College graduates, who should be rewarded for good work by additional pay and accelerated promotion. More time should be allotted to tactics, and less to military administration and law. The number of instructors should be increased, and all instructional duties taken out of the hands of non-commissioned officers. In order to induce cadets to work, no one should receive a commission unless he had gained a minimum of 50 per cent. in each subject in the final examination, and a total of 60 per cent. in the aggregate.

The only recommendation of the Committee with which we cannot agree is in their proposal to abolish the teaching of modern languages at Woolwich and Sandhurst. More especially do we fail to understand the reason for this, as the Committee rightly insist on the importance of modern languages to an officer by making one an essential subject for the entrance examination and by advising that extra daily pay should be given to all officers who pass the interpreter's examination. It seems to us a pity that there should be such a break in these subjects during a cadet's stay at one of these military colleges.

Another point the Committee have not sufficiently insisted upon is that the future instructors should not only be clever students and officers, but also capable *teachers*. It is a notorious fact that few military instructors do anything but repeat the words of text-books in their lectures; and many of them in talking to their pupils pour contempt openly on the Sandhurst course. The first duty of every teacher is to believe in his own work. We have no doubt that, if the recommendations of the Committee are acted upon, no longer will keenness for their profession be out of fashion, and that the promotion of the young officer will in future depend on the zeal and ability which he may show, and not upon his means or his influential feminine relations.

EDUCATION AND THE STATE.¹

THE responsible reviewer who approaches this book with the air of light enjoyment which he associates with most deliverances on the history of education soon finds that, though his reading is not without its proper pleasure, here is a very solid piece of work. Mr. de Montmorency's book is, indeed, full of meat very conscientiously and deftly packed; and it is undoubtedly the best history of the State's connexion with education which is to be found in English. Sir Henry Craik's little handbook of many years ago has long

remained the only *résumé* of the case available; but the compact volume before us covers Sir Henry's ground down to 1833 and much else besides.

If a review would duly inform readers of THE SCHOOL WORLD what the book contains, there is no method more appropriate than *enumeratio simplex*; but space and time and editors are against us. The author has made a special study of Statutes from 1164, cases from 1259, ecclesiastical papers from 926; and he seems to have consulted all available literature, from Matthew Paris to Mr. Leach and the Oxford English Dictionary "in progress." Even Shenstone and Miss Austen contribute. It is not too much to say that his book will henceforth rank as "indispensable," not to students only, but to all who wish to know something more of education than our amateur instructors and method-mongers tell us. Here is precisely the historical presentment of the case which should make us modest in our generalisations and in the advice, so freely offered, to hurry our old institutions to the scrap-heap. For instance, our make-believe Benthamites would often have us think that we need only ignore history to unmake the conditions which tradition has forged and riveted. Yet here we have testimony to the immemorial concern of the Church with education as an active propagator for the most part, and sometimes the reverse. And we rise with the conviction that it is the spirit of religious intolerance, acting with social and material acquisitiveness, that made the Church in its time, as it made the Reformation in its time, and the Nonconformists of the first half of the nineteenth century in theirs, the enemy of education.

Mr. de Montmorency has a humour singularly rare with writers on education. He tells, among others, a story bearing on tenure, from Mr. Leach's valuable "Memorials of Beverley Minster," with quiet *gusto*; and we shall soon repeat some of our most ancient experiences, when registration is in full swing. Incidentally, we get most important contributions to general history—how, for instance, the Great Death, in frightening away from England the alien priests, gave the mother tongue its first real start; how, in the early fourteenth century, the grammar schools were not used by the gentry; how the crown, in the person of Richard II., refused the petition of Parliament to deprive the poor of "clergie," which means education, a word first officially used in 1571; how the extirpation of Lollardy meant the destruction of the liberty of unlicensed teaching—to which unholy haven we seem once more to be drifting under a tyranny which may turn out to be the exact counterpart of the old ecclesiastical bondage.

We are deeply impressed, as we put aside this admirable work, with the conviction that education, like some other truly spiritual institutions, is a matter of ebb and flow; and that the first duty of the true friend of his kind in this era is to keep the professional and technical in a subordinate place, and to exalt and maintain the study of (to use Bacon's phrase) "the Arts and Sciences at large," the great architectonic studies.

¹ "State Intervention in English Education." By J. E. G. de Montmorency. 366 pp. (Cambridge University Press.) 5s.

NATURE NOTES FOR JULY.

By the REV. CANON STEWARD, M.A. (Oxon.)
Principal of Salisbury Training College.

Animal Life.—In the summer the round, or pear-shaped, nests of the diminutive Harvest Mouse, with its short ears, reddish fur, and prehensile tail, may be found attached to the corn stems. Observant eyes may discover the bigger Long-tailed Field Mouse, with its large round ears and round bright eyes, pretty and active in its habits. These are easily distinguished from the blunt-nosed Voles, one of which we call the Water Rat, the other the Meadow Vole, with short tail, inconspicuous ears, and reddish fur, a cousin of the Scandinavian Lemming, doing much damage to the farmer's crops.

Among birds, young Wild Duck, "flappers," are now plentiful in the water meadows. Sand Martins are still busy in their colonies in sand banks. Many birds are still occupied with hatching, chiefly their second broods. Cuckoos now begin to depart, as they have left their young to the care of foster parents. They have been known to lay in seventy-eight kinds of nests, even in Jays', Magpies', Wood Pigeons' and Dabchicks', but generally in the nests of Robin, Hedge Sparrow and Wagtail.

A study of the different kinds of Bees may now be made, of which no less than 250 kinds are found in England. They may be divided into two classes, the social and the solitary. Among the former are the Humble Bees, which live in communities in nests of moss, earth and wax underground; and among the latter are the Wall, Mason, Leaf Cutter and Carpenter Bees. The Stagbeetle hums past in the evening, and Burying Beetles may be seen digging the grave of some dead bird or mole. The different kinds of Lady-bird feed on the aphides and are of great value to the gardener. Observe the gauzy wings of the Earwig. Hive Bees kill the drones this month.

The following Butterflies may be seen:—Fritillaries Argynnis, Aglaia (Green), Adippe (High Brown), Paphia (Silver-streak), and Queen of Spain. The Purple Emperor, Hairstreaks, Thecla, W. Album (on bramble flowers), and Purple (on oaks). Marbled White, White Admiral, Red Admiral, Chalk-hill Blue, Clouded Yellow (clover), Painted Lady (thistles, roads), Small Skipper, Ringlet, Semele or Grayling and others. Among Moths the following will be observed:—Currant Clearwing, Carpets of sorts, Xylophasia, Angerona, Lithosia, Light Emerald, Drinker, Plusia, Five-spot Burnet, Buff Arches, Peach Blossom, Swallowtail M., Orange Swift, Hydrocampa, Tiger, Marbled Beauty, Willow Beauty, Double Square Spot, Oak Eggar, White Satin (willows), C. Nigrum, Lackey, Scarce Footman, July Highflyer (woods), Old Lady, Goat Moth (trees and palings).

Larvæ should be looked for. On nettles may be found Peacock, Red Admiral B. and Nettle-tip M. On violets the Fritillaries Euprosyne, Selene and Adippe; Lucina (on primroses), Painted Lady (thistles), Clouded Yellow (Dutch clover), Holly Blue (holly), Azure Blue (kidney beans), Marbled White (grasses), Clouded Skipper (grasses), Camberwell Beauty (willow and nettles), Convolvulus Hawk (small bindweed), Striped Hawk (vine, galium), Oak Beauty, Puss and Bifida (poplars), Five and Six-spot Burnet (birdsfoot trefoil), Miselina (hawthorn), Mallow M. (hollyhock and mallow).

Plant Life.—In flower may be found:—In heaths and meadows, small S. Johnswort (pulchrum), common Centaury, Campanula rotundifolia, Erica tetralix, Calluna vulgaris or Ling; in woods and hedges, S. John's Wort hirsutum and perforatum, Enchanter's Nightshade, Wood Betony, Epilobium angustiflorum, Traveller's Joy, Roses, Honeysuckle, Wild Angelica; in moist meadows and ditches, Procumbent Marsh-

wort, Scutellaria, Rumex conglomeratus, Square-stalked S. John's Wort, Elecampane, Flowering Rush, Water Lilies; in chalky and dry places, Orchis, Bee and Late Spider, Carduus acaulis and ardensis, Black Horehound, Polygonum persicarium, Calamint, Epilobium parviflorum and hirsutum, Galeopsis Ladanum, Wild Teazle, Scabiosa succisa, Artemisia; in fields, Musk Mallow, Galeopsis (Hempnettle), Carduus lanceolatus, Sow Thistle, Convolvulus, Toadflax (walls). Grasses, Rushes and Sedges may be distinguished and named.

Students of Fungus life may observe the development of the Smut (ustilago) in wheat leaves, Bunt (tilletia) in the grain, and the life history of the potato disease.

Folk-lore.—As usual, collect proverbial sayings:—

"S. Swithun's Day (July 15th) if it do rain,
For forty days it will remain.
S. Swithun's Day an it be fair,
For forty days 'twill rain nae mair."

"A swarm of bees in May is worth a load of hay,
A swarm of bees in June is worth a silver spoon,
A swarm of bees in July is not worth a fly."
"In July shear your rye."

THE INFLUENCE OF THE UNIVERSITIES ON SCHOOL EDUCATION.¹

OUR great English universities have till quite recently, as regards their direct action and influence, been to a large extent, we might almost say in the main, the universities of the privileged and the professional classes. Within my own memory they were indeed virtually monopolised by those members of the Established Church who belonged to these classes or were seeking to enter them. To the mass of the people they were something vague and far off.

Sixty years ago a distinguished German, in his description of them, said that their aim was to produce gentlemen, especially Tory gentlemen; and I am not sure that any of us could prove him to have been altogether mistaken.

But for half a century the process of nationalisation has been going steadily if not rapidly forward. It has been and is the earnest desire of the men who inspire and direct our university life to make them national institutions in the best and truest and broadest sense of the term; and they are, I feel sure, ready to give sympathetic and favourable consideration to any criticism or suggestion which is likely to help towards this end.

Thus I venture to think they will welcome the discussion by so weighty a body as the British Association of these very practical questions: How do our ancient universities act with special or directing or determining influence on English school education? And in connection with this influence are there any reforms which would be clearly beneficial?

The answer to such enquiries has to be mainly sought through observation of the examinations they conduct or require, the use they make of their endowments, and the type of teachers they train and send forth.

Through its examinations the university largely determines the curriculum or relative amount of attention bestowed on different subjects of study in the schools that prepare for it.

Through its endowments and prizes it fixes the bent of study to be pursued by the most promising and ambitious students;

¹ Abridged from a Paper read before the Section of Educational Science of the British Association, at the Glasgow Meeting, September, 1901, by the Rt. Rev. John Percival, D.D., Lord Bishop of Hereford. The Paper appears in the Report just published for the Association by Mr. John Murray.

and finally, by the stamp it puts on the teachers sent out, their attainments, their tastes, their aims, opinions, and ideals, it sets the tone and tendency of both life and work in the wide field of school education.

- I. As regards examinations we have to look chiefly at—
- (1) Examination of schools or of boys and girls still at school.
 - (2) Entrance examinations to colleges or to the university.
 - (3) Examination of students during the university course.

By their school examinations, such as the local examinations, the examinations of the Oxford and Cambridge Joint Board, and examinations for commercial and other certificates, experience shows that the universities have done a very good and useful work, and they have done it in a liberal and progressive spirit. The committees charged with this work have been allowed a tolerably free hand; they have sought the best practical advice, and they have aimed at consulting the needs of different types of school, whilst careful to maintain a reasonable standard of proficiency as a qualification for their various certificates. If there are defects in any of these examinations the authorities of schools and public opinion are to a great extent responsible for their continuance.

But when we turn from these outside examinations to the conditions of entrance to the university itself it must be admitted that we meet with some survivals that seem altogether out of date, and some obvious deficiencies that call for attention and reform.

Taking the case of Oxford, with which I am more familiar, it is to be noted that the examination known as Responsions or its equivalent is practically the wicket-gate through which every student must enter the University. The various colleges are free to admit students on their own terms with or without examination, but as a matter of practice it is usual for a college to require the passing of Responsions either before commencement of residence or in the course of the first term, so that for actual influence on the ordinary curriculum of secondary schools we may disregard all qualifying entrance examinations except this one. What, then, does the University in this examination require of a boy fresh from school?

Turning to the examination statutes, we find that every candidate desiring to pass Responsions or its equivalent examination has to reach the requisite standard of attainment in the following stated subjects, and in these only: Latin, Greek, Elementary Mathematics.

So much for the subjects required. But a glance at the papers set will show that as regards the literary portion of the examination the study encouraged is almost exclusively grammatical and of a very rudimentary type. The writing of elementary Latin prose, the translation of passages from one or two prepared books in each language, and the answering of questions on elementary grammar are the staple of the examination. No knowledge is required for the art, or literature, or history, or general life of Athens or Rome, and little or no enquiry seems to be made even as to the authors or contents of the books specially prepared. The mathematical part of the examination is also open to criticism, though perhaps in a less degree.

But the really surprising thing is that natural science still meets with no recognition, modern languages are ignored, and no questions are asked even as to the candidate's knowledge or ignorance of our own language and literature. Here, then, it must be admitted, in some room for expansion. We are even tempted to pause and enquire whether we have not stepped back into some earlier century; and I venture to think that it would be difficult to point to any single educational reform which is more urgently needed or would be likely to produce a more wholesome effect on the teaching in our secondary schools than a reform of this examination.

In the first place, if it were made permissible to offer certain

equivalents in place of Greek, this single modification would bring our universities into touch with that large and increasing group of modern schools or modern departments in schools which are now suffering from lack of this connection.

The existing requirement of Greek from every candidate, together with the accompanying exclusion of modern languages and natural science from this examination, practically dissociates this whole class of modern schools or departments in schools from direct university influence, and the effect is found to be specially unfortunate in the modern departments of the larger secondary schools.

Whatever may be a boy's ultimate aim or profession or business in life, if his intention is to pass through the university, these conditions amount to a warning that he had better avoid a modern school or modern department. Consequently such schools or departments are very liable to become the refuge of the dull or the idle or those who are preparing for nothing in particular, so that standards of effort and attainment are inevitably lowered. In drawing attention to the consequences of these antiquated university arrangements I desire to say that I am not raising theoretical or hypothetical objections to them, but simply speaking of what I have seen and known in one school and another; indeed, I would claim that throughout this paper I have been careful to bear in mind the old Newtonian example which is, I imagine, sometimes disregarded even at the British Association, "Hypotheses non fingit."

Thus, as the result of my personal experience, the first reform I would advocate is that Responsions without Greek should be made an avenue to a university degree for all candidates who can reach a good standard of attainment in certain equivalent subjects of study.

So much for our first change in the direction of liberty of choice. We may now go on to consider whether or how far any other changes would effect some improvement in the kind and quality of ordinary school education.

So far as the school curriculum is influenced by this examination, with its rigid exclusion of everything but elementary mathematics and the grammatical study of two dead languages, it must be obvious that it would be improved by an infusion of subjects and methods, the greatest of all needs in our English education being scientific methods, that would help to develop such qualities as observation, taste, thought, and interest in the world around us.

With this view I venture to put the question whether the following scheme of requirements on entering Oxford or Cambridge would not constitute a reasonable substitute for the present Responsions or Little Go:—

(1) Latin.—The examination to include the translation into English of easy, unprepared passages and also some questions on a select period of Roman history and literature.

(2) Elementary mathematics.—More attention to be given to scientific arithmetic and to easy original work in geometry.

(3) The elements of natural science and scientific method.

(4) An elementary knowledge of either French or German or Italian.

(5) English.—The examination to include—

(a) English composition.

(b) Questions on some period of English history and literature.

(6) Greek.—The examination to include translation into English of easy, unprepared passages and also some questions on a selected period of Greek history and literature; or

(6a) French, or German, or some branch of natural science.—The standard required to be such as to show that the candidate is fitted to enter on an Honour Course of university study.

It would be reasonable that any student who had passed in three of the six subjects here required should be allowed

to commence his residence in the university on condition that he pass in the remaining three before admission to any other examination in the university course. As university study tends to become more specialised it is all the more necessary thus to secure at the outset a good preliminary liberal training.

Such a scheme as is here indicated would do this, and it would exercise a most wholesome influence on school education generally. On the one hand, it would compel all schools preparing students for the universities to give a fair share of attention to modern and scientific studies, and more attention than is generally given to our own language and literature; whilst it would at the same time interpose a check on the mischievous tendency to premature specialisation of study whilst a boy is still at school.

To these suggestions I have to add one more. This examination, like some others at the university, is a purely "pass" examination, in which no opportunity is offered to the candidate of winning any honours, and no mark of distinction can be gained by work of unusual merit. In my judgment, the continuance of any such pass education is educationally a grave mistake, and I desire to see it made a rule that the university will give marks of distinction for work of superior merit in every examination which it conducts.

The reasons in favour of such a change are sufficiently obvious, the surprising thing being that the pass examination, with its corresponding type of university student known as the "passman," should have been left to survive into the twentieth century. A standard which every student is required to reach as a preliminary to further instruction, or as the qualification for a degree which is understood to be within reach of any person of ordinary intelligence, is of necessity a comparatively low standard.

I plead for such changes as I have here suggested in the belief that the effect would be to send a fresh stream of intellectual activity through many of our schools, to give a fair field to modern and scientific studies, and to draw out the undeveloped capacities, the dormant faculties and gifts of many of our boys and young men, whilst doing no harm to the traditional classical culture of either school or university.

No experienced person looks upon these university requirements as in any sense representing what candidates of eighteen years of age about to enter on a university course ought to have studied. Neither does any experienced school teacher doubt the capacity of the ordinary boy or girl, if properly trained in habits of industry and attention, to master my schedule of subjects sufficiently. To the plea that, the present limited range of subjects being so indifferently mastered, it would be folly to widen the range, the real answer is that the English schoolboy is, as a rule, a very practical person. He has no great enthusiasm about learning for learning's sake; he has come somehow to understand that a certain minimum will serve his purpose when he presents himself at a college in Oxford, and so his mind is quiescent in front of his Xenophon, or Euripides, or Virgil, or Euclid, or it is occupied with other things.

He is commonly described as an idle boy, but this, I venture to think, is a misnomer. Give him a practical motive for learning, extend the range of his practical interest in subjects to be studied, stir his practical instincts, rouse his personal ambition by making it clear to him that he may win some distinction in such and such subjects for which he has shown some aptitude or ability, and he sets his mind to work and learns what is required of him with an amount of success which is not seldom a surprise both to himself and to his teacher. So experience shows us to what an extent our antiquated educational arrangements leave capacity undeveloped and let young lives run to waste.

My concluding observation on this subject of examinations is that I should prefer to see the examination of secondary schools retained, as far as possible, within the circle of university influence. Even in the presence of the right honourable gentleman who presides over us this morning, I must pluck up courage to say that I should regret to see it established exclusively at Whitehall. My hope is that, whatever reforms are instituted, the headquarters of this work may somehow be maintained in connection with our universities, so as to secure that the men who examine may be familiar with the current work of both school and university, and, as a rule, men who either are or have been themselves engaged as teachers.

I now turn to the influence exercised through university or college endowments. This part of the subject is of such importance that it might advantageously be considered by a fresh university commission at no very distant date, experience having shown that the reforms of previous commissions stand in need of some further revision.

The system of election by merit or unrestricted open competition, ridding us, as it has so largely done, of a system of patronage and privilege and arbitrary preferences, has brought great benefits to English life; but in regard to educational endowments, both at school and university, it is now seen to have been made in some respects too universal and absolute.

One result of our present system is that prizes go too exclusively to the well-to-do. A considerable proportion of the endowments, both at school and college, given as scholarships or exhibitions is enjoyed by those who do not need such pecuniary assistance. There is consequently a certain amount of waste which might be avoided. But a much stronger objection to this unrestricted competition is that the endowments in many cases thus become the rewards, not of the most promising ability, but of the most elaborate and expensive preparation: "To him that hath shall be given." These considerations suggest that, whilst the principle of open election by merit should be scrupulously maintained, the value of open scholarships and exhibitions, both at school and university, should be considerably reduced, and the amount thus saved should form a supplementary exhibition fund out of which the authorities might increase the emoluments of every meritorious scholar so elected who applied and gave proof that his pecuniary circumstances were such as to call for this addition.

My other criticism on the present use of endowments has reference to the premature specialisation encouraged and fostered by the offering of scholarships for special subjects. The scholar elected for proficiency in classics and mathematics combined, and prepared to read for double honours, is said to be almost extinct at Oxford, whilst the literary critic complains that in some cases scholarships in mathematics and natural science are awarded to candidates who are almost entirely destitute of the elements of a liberal training.

It may, I fear, also be said that history scholarships are at times awarded to boys who have been diverted to exclusive reading of history at a time when they would have been better employed on the general curriculum of school work.

And it might even be urged that in many schools the classical training is little more than a sort of old-fashioned specialisation on the learning of two languages, with very little of that training of thought, or taste, or faculty which would be given by an adequate amount of attention to a wider range of subjects, and, what deserves to be specially noted, with no training at all in scientific method.

Whatever force there may be in these various allegations, it must be obvious that, in so far as premature specialisation is thus encouraged by the universities, their influence on our

schools is being exercised to the detriment rather than the encouragement of a truly liberal and well-balanced educational system.

I limit what I have to suggest on the influence exercised by our universities through the training of teachers to a few brief concluding words.

As a rule the authorities of secondary schools prefer to employ university graduates in all branches of school education, and it is most desirable that this preference should be encouraged and assisted by every possible means; for there is no better service which the universities can do to the nation than that of training and sending out highly-qualified teachers. And yet till quite recently no attention has been given to this aspect of their work apart from the general courses of study which are provided equally for men who are looking forward to other professions or to no profession at all.

It may possibly be argued that it is not the business of the university to give pedagogic any more than medical, or legal, or industrial, or commercial, or any other form of technological training. This, however, is only partially true, seeing that, in the first place, a university cannot properly fulfil its function as a teacher of its own students so long as it continues to give no training in the art of teaching, and, in the next place, the relationship in which the universities stand to school education is entirely different from their relationship to the various professions and occupations of later years.

Thus we may fairly argue that it is high time for our ancient universities to give more special attention to educational methods, and more encouragement than has hitherto been given to the selection of such courses of study and such combination of subjects as will form the best equipment for that large body of students who year by year go out direct from the universities to the work of teachers in secondary schools.

I plead for these various reforms on the ground that, whilst pouring a stream of fresh life and interest into many of our secondary schools, they would involve no interference with any of the higher functions of our universities, no undue dissipation of energy, no lessening or lowering of their work as homes of learning and research.

For convenience and clearness it may be well that I should briefly summarise the chief suggestions I have ventured to make.

A. Examinations.—(1) The external examinations conducted by the universities would in many cases be better and more valuable if made more concrete and practical.

(2) In the entrance examination to the university (Responsions or Little Go):

(a) Candidates should be free to offer some suitable equivalent in place of Greek.

(b) Some other much-needed improvements should be introduced, *e.g.*:

(i.) An elementary knowledge of natural science and of one modern language should be made obligatory on all candidates.

(ii.) Ability to write English should be tested, and a knowledge of some period of English history and literature should be required.

(iii.) The examination in Latin or any other language should include questions on some period of history or literature, and on the subject matter of any prepared books, together with the translation of easy passages from authors that have not been prepared.

(iv.) Candidates should not be excluded from residence before passing this examination, nor should they be required to pass all subjects at the same time, but the passing in all the parts of this examination should be a necessary preliminary to entry for any other examination required for a degree.

(v.) It might reasonably be made a rule that no scholar should enjoy the emoluments of his scholarship until he had passed this examination.

(vi.) Marks of distinction should be given for work of superior merit in this and every other examination conducted by the university.

B. Endowments.—(1) The value of open scholarships and exhibitions should be considerably reduced.

(2) The money thus saved, or part of it, should be given in augmentation of scholarships held by poor students.

(3) A fair proportion of scholarships should be awarded for excellence in a combination of subjects.

(4) As a rule, no scholar should be allowed to receive any emolument till he had passed Responsions.

(5) A percentage of the endowments now awarded as entrance scholarships (say 5 per cent. or more) should be distributed over the country as county scholarships on condition that the county raised an equivalent sum in each case; and a due share of these should be allotted to girls.

C. Training of Teachers.—(1) There should be established in each university an Honour School or Tripos specially suited for those who are to take up the profession of teaching, and qualifying for the degree of B.A.

(2) The establishment of such a school would carry with it the provision of adequate professorial and other instruction in the subjects required.

HOLIDAY COURSES: THEIR ADVANTAGES AND DISADVANTAGES.¹

By MICHAEL E. SADLER, M.A.

To grumble at holiday courses is a rather un-neighbourly act. It is like looking a gift horse in the mouth. Few people can know how much time and thought and trouble are given to the planning and to the superintendence of these educational festivities. When everything seems to move by clockwork, when no lecturer is ever late, no entertainment ever bungled, no official ever cross, we take it all as a matter of course and feel all the more justified in criticising whatever faults may have marred the execution of so easy a task. And yet all this smoothness of working has cost much anxious forethought for months in advance. In spite of their smiling faces the organisers of the courses are often doubly unhappy. They are harried by the most intricate sorts of worry, and many of them suffer secretly from remorse at heart. Some of them know that they have murdered the sleep of the Long Vacation, and that they will be rebuked even by the gentle Elia in the Elysian Fields. Meanwhile they are bound to the Wheel of Things, and are very far from their deliverance. No Chinese puzzle can be so aggravatingly perverse as the bits out of which the patient, persevering secretary has to piece together the programme of a holiday course—sometimes ironically called a picnic. And when the work of organisation has to be done from a great distance, in a foreign language, with a tuppence-ha'penny post, no answer gettable within three days, telegrams tuppence a word, and businesslike promptitude not yet as universal as military service, the secretary must sometimes open his mouth and lament his day. To all of them, and to their long-suffering colleagues, let us give honour and thanks. Then, having done that, we can turn with a good conscience to the duty of criticism.

The worst thing that you can say against a holiday course is that it is a holiday course. Is there not something in the very

¹ A paper read at the Conference of the Teachers' Guild held at the College of Preceptors in January, 1902.

idea of working in the holidays that jars on the conscience? It isn't as if the people who are slack in term time were those who made up their arrears in the holidays. It is the industrious apprentice that cannot shake himself (or, more generally speaking, herself) free of the class-room. When everything has got itself tidily organised in this most systematic of lands, perhaps no one will be allowed to attend a holiday course without a medical certificate. I confess, however, that in a somewhat prolonged experience of holiday courses I have rarely seen anyone looking very much the worse for it. But the theoretical objection remains, and is evidently unassailable.

The charm of discussing questions such as whether it is right to go to a holiday course lies in the fact that no general conclusion is possible. I can imagine its being an act of almost sublime self-denial even to go near one; or, in other circumstances, its involving an unjustifiable risk of a nervous breakdown. But some people, call them misguided if you will, evidently like them, and even derive advantage from them. In fact, a considerable number of the holiday courses have met with great success, and have received as many genuine testimonials as a prosperous patent medicine.

Will you kindly allow me, instead of venturing on general propositions, to confine myself to the consideration of some individual instances? The simplest way of doing this is to personify my illustrations, somewhat after the manner of our predecessors, the moralists of the eighteenth century.

EREMITES, for example, is a schoolmaster who conceals under a veil of practised geniality the shy ambition of a recluse. Did way open and duty allow, he would live far away from the "buzzing schoolroom"—

In the lone brakes of Fontainebleau,
Or chalets near the Alpine snow.

But, as things are ordered otherwise, he has made the best of it—such a best that he would blush if he knew how much his old pupils love and revere him. The least precious part of his work is done in the schoolroom, where he is set to teach some things that he cares about and many to which he is indifferent. Among other tasks, he gives lessons in French, with more zeal than success. Must this man be harried into spending some windy weeks at Easter, or scorching days in August, in some gabbern Lycée, with a vain hope of acquiring that most elusive of gifts, the power of pronouncing one of the most subtle of languages? Surely it will be better for his pupils and better for Eremites himself if he puts on his knickerbockers and his hobnailed boots and tramps with some crony through old familiar places in Valais or Tyrol.

Then there is INSULARIS, who thinks less highly of continental nations than he ought to think, and whose prevailing ideas of German literature are founded on hair-raising extracts from Teutonic newspapers in our daily press. If he goes for a short tour abroad, he maintains, except under stress of the Douane, an attitude of somewhat indignant isolation—partly on principle, partly because he cannot understand anything that he hears or much that he reads. Sometimes, therefore, when Insularis observes the seamy side of continental methods of organisation he feels obliged, as a British subject, to give utterance to his opinions, and then he suffers under the disadvantage of being understood by many whom he does not suspect of being able to understand him. Insularis might get a world of good from a well-selected series of foreign holiday courses. His patriotism would be chastened, but confirmed.

Some holiday courses, which shall be nameless, have been defined as "co-education with the men left out." Perhaps, therefore, my first imaginary portraits ought to have been women.

SCRUPULOSA is a high-school mistress, and corrects exercise books with a minute accuracy which leaves little time for

private pleasures. She has hard work and much responsibility, and needs complete rest and change in her holidays. Will she not as a rule gain far more, both for herself and her pupils, from spending her summer in some quiet place in high air with an intimate friend than from attendance and industry at a holiday course?

GARRULA is one of the kindest of beings, but also one of the most industriously superficial. She has heard more lectures than any other woman of her age, and has acquired a habit of talking about things which she imperfectly understands. Her intellectual susceptibilities are like shavings in a grate, somewhat combustible. A holiday course of the *omnium gatherum* sort would add fuel to the flame. A severe course of grammar and French exercises might be salutary discipline.

RUSTICA lives a retired and uneventful life in the country. She is restricted to a rather limited circle of acquaintances. Most of her time is spent with near relations much older than herself. She has to read the newspaper aloud more than she likes, and her mind is full of half-formed ideas which seem a little at odds with her old-fashioned but affectionate surroundings. For her, a really good holiday course is a wonderful stimulus. She begins to see the bearing of things. What she has read gains reality and significance. She makes new acquaintances, is able to speak more freely, and goes home better able than before to make good use of her leisure for reading and reflection. There are many whose intellectual life would have been far narrower and poorer to-day had it not been for attendance at a holiday course, especially at Oxford or Cambridge.

I have tried hard to say all I can in criticism of holiday courses, but the attempt leaves me only the more convinced that (for some people, at certain places, and under right conditions) they are very valuable institutions; useful educationally in stimulating intellectual interests, in giving a wider outlook over the field of knowledge, and in suggesting new modes of study and new lines or combinations of thought; and, if the social side is carefully organised and liberally provided for, not less useful in bringing people together, in rubbing away prejudices and in strengthening ties of sympathy and respect between persons of different nationality. I hope that my criticisms may not be taken more seriously than they are intended, for there is no one who has better reason to believe in the usefulness of holiday courses than I have, and there cannot be very many who have been privileged to see much more of their organisation.

Let us acknowledge that to some people—and those not over fastidious in their taste—anything that smacks of the personally conducted tour—whether through fine scenery or ideas—is an abomination. They detest doing things in crowds, and dislike being harangued by local antiquaries in places of public resort. Others suffer less from these experiences, having a more inward eye. The latter, when they attend holiday courses, much enjoy the ready access to many things—galleries, libraries, lectures, etc.—which are closed or not available at other times. But a successful holiday course is a very complex thing. Success depends on the weather. It depends on the place. Why cannot we try more holiday courses in high air and mountain country? It depends on the lecturers and teachers. No one would believe how dull some people can be until they have heard them. It depends very much indeed on the social arrangements of the meeting being made with tact, with hospitality and yet with avoidance of embarrassing excess. It would be interesting if some one would bring out a class-list of holiday courses, taking all these different points of merit into account. Last, but very far from least, the success of a holiday course depends on the geniality and good feeling of the students themselves. It takes three days for a holiday course to settle down.

At that point there begins to emerge a common sentiment which is the state of mind of the whole gathering of students. No one can say where it comes from, or predict beforehand what it will be like. No two holiday courses are ever quite the same. They may be enthusiastic, or they may be critical, merry or in the dumps, cordial or icy. You cannot mistake the feeling when it once shows itself. But, as a rule, every holiday course has the state of mind and temper which it deserves.

There are many kinds of holiday course, some big, some little; some in Great Britain, some abroad, and scores in America; some for languages only, some for manual exercises only, some chiefly for physical science, some for history, literature and economics, some for theology; some are specialised, some universal in their appetite. As to which have proved the most successful, opinions will differ. Personally I am inclined to think that, on the whole, history, literature and economics lend themselves best to treatment at large gatherings, and that languages and manual exercises are best studied at small ones. It is a gain if from year to year there is some sort of sequence in the subjects, but, so far as possible, a recurrence of favourite lecturers. Every holiday course should have an idea behind it. Good syllabuses are a great help, but it is hard to get some lecturers to prepare them in time. Students should have access to a convenient library. Four lectures a day are enough.

There are in Europe at least twenty holiday courses of one kind or another held every year. Probably the number is greater, but I know of no complete or classified list. During the last few years there has been a striking development in the number of holiday courses for instruction in modern languages. We owe this movement in large measure to the foresight and initiative of Dr. Findlay, to the labours of those who carried forward his work—especially Mr. Marvin and Mr. Longsdon—and to the support and enterprise of the Teachers' Guild. Doubtless these holiday courses provide a very useful opportunity for rubbing up, or keeping bright, or extending the knowledge of a foreign tongue. But let us not cherish the mischievous delusion that we can fully train teachers of modern languages by sending them to France or Germany for three weeks at Easter or a month in the summer holidays. The kind of modern-language teachers whom we most want in England, and shall want in increasing numbers, must be trained in a much more searching and costly way than that. A thoroughly good secondary and University education to start with, and then two years abroad devoted to the study of the language or languages to be taught, together with practice, under criticism, in the art of teaching—this, I would submit (though my words have no official sanction), is the minimum at which we should aim in regard to the training of the teachers of modern languages for our English secondary schools.

AN AMERICAN VIEW OF ELEMENTARY ART EDUCATION.¹

NOTHING is of greater value to the young, and to all others, than the possession of a physical being capable of making the refined, delicate, skilful, and accurate movements which minister in so many directions to the welfare of the organism. Nothing is of more importance than a mental structure built up by accurate observation, and filled with clear, lucid, comprehensive, and distinct ideas as a result of this fine and varied experience. And, lastly, it is of extreme importance to possess a strong, aspiring soul, capable of giving an energetic impulse

¹ Abridged from an abstract of lectures delivered by Mr. J. Liberty Tadd, before the Society of Arts. The abstract is contained in the *Society's Journal*.

to the mind and to the body in the direction of the right and the necessary.

With this threefold end in view, wishing to train at the same time the brain, the muscles, and the will, the painful experiment and practical experience of many years have led to the system of art and manual training developed by Mr. Tadd in Philadelphia at the Public Industrial Art School, where he gives instruction to 1,200 students each winter, chiefly pupils of ten to fourteen years of age, taken from the grammar grades of the various public schools. From 100 to 300 teachers are taken through a normal course, and the work is also carried on in the Roman Catholic schools of Philadelphia under his direction, as well as in several schools connected with churches, and a number of private institutions.

In the beginning nineteen different branches of handwork—wood and metal work, drawing, painting, and modelling of various kinds—were tried. But as the result of many years of careful experiment and observation, certain things have been recognised as fundamental to any real system of art and manual training, viz., drawing, designing, clay modelling, and wood carving. And in the working out of the application of these fundamentals certain features, radically characteristic of the system, have been evolved, such as a systematic sequence of classes, memory drawing, creative work in design, ambidexterity, correlation of subjects, and real Nature study.

The method of drawing taught differs entirely from that carried on in the ordinary schools and art institutions, where imitative work of various kinds is usually practised; copying from objects, type forms, and flowers; mechanical drawing, sometimes drawing from the flat and the cast. Mr. Tadd's method, on the contrary, consists—

(1) In the practical development of the entire organism—the hands, the eyes, and the intelligence—by the acquisition of conscious control, followed by automatic control.

(2) In the use of powerful formative exercises at certain periods, for the purpose of gaining facility, balance, proportion, accuracy, a knowledge of magnitudes, a sense of beauty, fitness and grace.

(3) Exercises in different mediums (wood and clay), for acquiring dexterity and skill in bodying out various concepts.

(4) Exercises for acquiring accurate and permanent organic memories of environment (a) from Nature, at periods when impressions are most vivid, from animals, flowers, insects, shells, &c.; (b) from art works and ornaments of the best periods, and in creative designing in various materials.

In all the schools the usual work goes on, drawing from models, and from the antique, water-colour work, instrumental work, &c. But to develop fully the powers of the body, during the early period of growth and development, manual expression must be automatic. All the fundamental motor co-ordinations must be mastered during the only time when they can be well and thoroughly made, *i.e.*, during the nascent period.

Children cannot, in the beginning, accurately perceive form, and consequently they cannot make it. The perception of form requires experience, mental and physical, which must first be organised—function giving power. Power is planted by performance. Some teachers are unreasonable enough to expect little children to draw accurate forms from the outset, which they themselves are unable to draw. Automatic facility must precede accuracy. Only by gaining facility can accuracy be acquired. If facility be properly gained, accuracy comes with ease.

Rotation of Work.

By rotation of classes is meant that the pupil works at drawing, modelling and carving in turn. A complete course in one subject, and then a course in the other, as is usually

done in schools, is not given, but the pupil puts the same ideas on a flat surface, in soft clay, in tough wood, in turn. This gives a wonderful amount of physical co-ordination and manipulative dexterity and experience. It also prevents young children from becoming tired or weary of any one branch, the continued change of medium renewing the pleasure and novelty of working. The variety of work in fundamental materials also tends to disclose the capacity, disposition and special inclination of pupils.

All children, without exception, even the feeble-minded and insane, have an energetic liking for and disposition for working in some of these branches. All children are willing to work with energy in the three mediums in succession, even though they may dislike any individual one or other, unconsciously gaining submission to discipline and drudgery. Discipline and drudgery of certain kinds are essential in all continuous work, and are an especial help in the formation of habit and character.

Memory Drawing.

Memory drawing in all the grades is insisted upon, because, in reviving and recollecting impressions previously received, such impressions are strengthened, intensified, and are knit into the mind—are made more organic. Memory drawing gives a definite outline to all mental operations.

Fluent power of expression must be gained through memory drawing at the same time that the children gain the other fundamentals—facility, balance, proportion. This must be done during the period of development, for the acquisition of this power is easiest then.

Memory drawing is an invaluable instrument for gaining fundamental ideas and impressions of the numberless things, facts, and forces in nature which are necessary for every child. On such a foundation can be built the more abstract studies, without subjecting the child, too early, to the mental stress and strain of the more formal thought-studies.

Memory drawing is also an important factor in aiding the child to assimilate, and fix into the mind inspiring and fascinating impressions (especially of beauty forms) which would otherwise be cloudy and indistinct in after life. Memory drawing is also of supreme value because it enables the pupil to grasp the essential features of an object, instead of the details. This is one of the most desirable requirements in art work.

One of the chief obstacles to overcome in copying or imitative work is the constant tendency to notice details instead of the main facts, drawing feathers instead of a bird, drawing hair or wool instead of the sheep or dog, as the case may be.

From the very first, children are required to draw from memory, and the crudity of the result in the early stages is not regarded as a drawback. What is aimed at is the effect on the brain by much repetition of these memorised drawings, the mental impression becoming gradually more and more accurate as observation grows keener, and as facility in recording the impressions observed is gained by practice.

Creative Drawing.

From the very beginning the children exercise the creative capacity, the "divinity in man." They never touch paper, clay, or wood, without embodying their own arrangements. At first these designs or creations are necessarily crude, but, with experience and guidance, children soon evolve fine, original, and artistic designs. It must, however, be borne in mind that, unless the teacher himself has this creative power, it cannot be expected from the child. Only teachers able to draw should teach drawing.

The children are thoroughly grounded in fundamental units of the various great styles in ornament—by preference, the Greek, Moorish, Renaissance styles. By means of repetition and practice, the pupils become able to use these units with the ease, grace, fitness, and beauty of the best designers, because they are also taught the actual principles and laws that underlie and are embodied in these forms—principles and laws which cannot be learnt by observation or by imitation alone.

Ambidexterity.

Another of the characteristic features of the work advocated is ambidexterity. By this is meant that both hands should become dexterous—not, as some hasty critics assume, that the left hand should do everything that the right does.

Even in those actions which are best done by a single hand, the training of that hand and the training of the necessary muscular co-ordinations have an excellent effect on the whole organism. Much greater is the effect when, instead of neglecting the left hand, as is usually done, it is trained to perform the actions for which it is fitted, and, still better, to act in conjunction with the right hand.

In all arts, crafts and trades both hands are used, one assisting the other. Few attempt such work as carpentering, modelling, carving, &c., without using each hand; and the more skilled, refined, delicate, and accurate the movements of each are, and the more instantaneous the automatic obedience of each hand, the more powerful does the cerebral action controlling these movements become.

By the use of both hands, in as many physical co-ordinations as possible, energy is accumulated in the corresponding motor centres. The muscular co-ordinations in the hands of some children are crude and imperfect, shown by the clumsiness and awkwardness of the movements they make. Such children require an ambidextrous training more than any others.

Power of Repetition and Correlation.

In childhood the power of repetition in storing the brain with energy for use in after life is enormous. Probably not a single movement or motion is lost or wasted; the single movement of a wrist or hand exerting an influence and helping to shape habit, conduct, and character. We claim that it is only by constant repetition of motor movements that complete ideas and habits can be formed, and sufficient energy accumulated for the proper discharge of these ideas. So great stress is laid upon the repetition of certain forms and impressions until they become automatic; only then can they be used as aids to thought expression.

Few have the power to retain impressions of forms of any kind after drawing them but a few times. It seems absurd to find, as is frequently the case, many art students quite unable to draw a hand or a foot in any position without a model; surely years of training should give them this power—power that is gained by our children at a very early stage.

Unless drawing is used as a mode of thought expression, it should have no place in school work.

Drawing as a mode of thought expression can be used to simplify and unify the course of studies. Drawing releases the strain put upon the verbal memory, by locking facts into the mind through other channels—touch, muscular sense, sight, &c. All the simple facts in anatomy, astronomy, zoology, &c., can be rendered by delineation and diagrams, this *deed* work tending to give a definiteness of outline to ideas, and impressing them more permanently on the mind.

Nature Study.

All education, and especially art education, rests upon nature study. The first and supreme thing to do with children is to

impress them with a love of Nature. Are we wise, then, if we give them print—books, printed, written, and spoken words—symbols of knowledge? Should we not, first, give them *things*, Nature and truth? Someone has said, "In books we find truth in black and white, but in the rush of events we find truth at work."

In Mr. Tadd's city schools, birds, fish, shells, insects, minerals, leaves, &c., are provided for inspiration. Fundamental impressions, on which all others are based, are made of form, colour, texture, structure, function, and so forth, at the period when the children are fascinated by these forms. The impulses of joy and gladness received through these impressions are of far greater value than many formal lessons.

Visits are also made to museums, academies of natural science. The children are not paraded through many rooms, where they would get faint and superficial impressions of numberless things, so that the formation of clear ideas is an impossibility. On the contrary, the class visits systematically a few inspiring and interesting forms, and while the impressions are fresh, an endeavour is made to make them permanent and lasting by using as many senses as possible.

In the Philadelphia summer school there are much better opportunities for Nature study. There is a constant succession of events happening in plant life, in insect life, and among animals. The students have regular places to visit, to observe birds'-nests, porcupines, fish, snakes, frogs, &c. Permanent and abiding impressions are made, especially of interesting incidents and forms. That these fundamental and fascinating facts are permanently organised is of much more importance than learning scientific names, consecutive series of events, technical terms or classifications.

Habit.

Teachers must consider the almighty force of habit. Almost all our movements, mental and physical, are the result of habit. Habits should be formed systematically and regularly.

The life of the child is divided into periods, well marked:—

(1) The period of play, of rapid growth of the body, of rapid growth of the brain, when vivid sense impressions should be made.

(2) The period when thought studies are harmful.

(3) The period when energetic movements of the limbs should be made.

(4) The period when it is of supreme importance that refined, skilful, and accurate movements of the hand should be made.

(5) A period when we can touch and awaken certain emotions and subdue, repress, and curb others.

These are the periods of development. One of the greatest evils of the present system is to occupy these periods, the most precious in a child's life, with thought-studies and abstract intellectual work, making the brain cells weak and feeble, instead of powerful and energetic.

During the periods of development, when habits are being formed, the powers and instrumentalities of the organism must be developed.

What are these instrumentalities? The brain, the hands, the eyes, the tongue, &c. They must be made sharp, keen, acute, and responsive.

What are these powers? Are they not—accurate observation, keen perception, sound reason, energetic action, with the good mental health and strength of character which come from their proper development?

During this development the future life of the child should be kept in view—its bent, capacity, and disposition. Fundamental, generalised hand skill should be given, and then, as the child grows in experience, specialisation in different directions.

Is it right that the child should become adult before finding out its capacity and power? Should it not grow into the knowledge of its own instrumentalities, and, as it does this, also grow into the power of using them?

Wood-carving.

Many of these evils are abolished by wood-carving. Carving is used to produce energy of action and strength of character, entirely apart from its usefulness as an art. In carving the pupils stand erect, breathe deeply, fix the thorax, and use many large and important groups of muscles. They have to grip tools with both hands with continuous energy.

Physical grip, especially hand grasping with energy, is to some extent the counterpart of mental grip, apprehension. By gripping, not merely exercise of the twenty-five or thirty muscles of the forearm, but also the bones, tendons, circulation, nerves and glands are influenced, and especially the motor centres in the brain in which the hand is rooted.

Much confusion has arisen in the minds of many teachers of woodwork and construction, who think that manual training can be acquired by shaping various forms in wood or metal. Few of them have any knowledge of art, and do not realise that the manual training which is not artistic is a delusion, and that the art work which is not manual training is a snare.

Real manual training means the complete dexterity of both hands, each executing the most complicated and entirely different functions at the same instant. This synchronous control of multiform activities by the hands being exercised automatically, leaves the mind entirely free to exercise itself with the thought that the hands are to express.

Clay Modelling.

Clay modelling is one of the most perfect means of thought expression that has yet been devised for elementary work in schools. Tested by experience with over 18,000 pupils of all grades, from the child in the kindergarten to the adult, it has been found most feasible of application, more joy-giving, more instructive and educational, than other mediums.

Paper weaving, folding and cutting, stick laying, paper pricking, cardboard work, whittling, knife work, are all feeble and nearly useless in comparison. Too much time is "killed" by work of this kind; it is "busy" work, and, of course, all children can be made to be interested in it, but it has slight educational value, and in many cases is thoroughly harmful. In some cases much injury is done by the shortness of sight, and using fine finger-movements at too early a period—before the bones and muscles are thoroughly formed—resulting in much damage to the organism. Experience has proved that more results can be gained by drawing and clay modelling than by all the other occupations combined. Clay modelling properly taught gives a better idea of form than any other medium, because in delineation or drawing one view only is presented on a flat surface, and in modelling the form is made in the round.

Modelling admits of individual work being done by every pupil according to his capacity. The endless series of forms that are possible, from the simplest balls or marbles to complex animal forms, makes it perfectly suited to all grades. Each time the child handles clay it is bringing into use its powers and instrumentalities, the powers of observation, judgment, reason, and, at the same time, using its hands, eyes, and brain. In fabricating things it fabricates ideas; it is forming the habit of work, making firm the union between "thought" and "action," and acquiring neatness, invention, and creative capacity.

OXFORD LOCAL EXAMINATIONS. SET SUBJECTS FOR 1903.

REFERENCE was made in our last issue (p. 225) to the important changes which have been introduced into the regulations for Senior, Junior, and Preliminary Oxford Local Examinations, so that it is only necessary here to give the special subjects prescribed for the examinations of 1903, for which space could not be found last month.

Preliminary.

- Religious Knowledge.*—(a) I. Kings x.-end, (b) St. Luke vi.-end, (c) Acts xvii.-end, (d) Church Catechism.
- English History.*—Either the Outlines from 1399 to 1603, or the Outlines from 1715 to 1820.
- English Author.*—Either Scott's "Talisman," or Longfellow's "Hiawatha" and "Evangeline," or "Poems of Nature" (Clarendon Press), III., V.-VII., IX., X., XII.-XV., XVII., XIX., XXII., XXIII., XXVI. (ll. 1-264), XXVIII.-XXXV., XXXVII., XXXIX., XLI.-XLIII.
- Geography.*—Full knowledge of England and Wales, and a general knowledge of (1) elementary geographical terms, (2) Europe.
- Elementary Latin.*—Nepos, "Selected Lives," by J. B. Allen (Clarendon Press).
- Elementary Greek.*—Abbott's "Easy Greek Reader," Parts I., II. (Clarendon Press).
- Elementary French.*—A. de Musset's "Pierre et Camille" (Hachette).
- Elementary German.*—Hauff's "Karavane" ("Kalif Storch," "Das Gespensterschiff").
- Elementary Italian.*—Carcano's "La Madre e il figlio" (Hachette).

Junior.

- Religious Knowledge.*—(I.) Either (a) I. Kings; or (b) Acts xiii.-xxviii.; or (c) Prayer Book. And (II.) Either (d) Isaiah xl.-lxvii.; or (e) St. Luke.
- English Literature.*—Either Shakespeare's "Macbeth," or Scott's "Talisman," or "Poems of Nature" (Clarendon Press).
- History.*—Either (a) Outlines of Roman History from 146 B.C. to 14 A.D.; or (b) Outlines of General English History from 1763 to 1815; or (c) Outlines of English History from 1399 to 1603, with special questions on the reign of Elizabeth; or (d) Outlines of English History from 1715 to 1820, with special questions on the period 1789 to 1815.
- Geography.*—General: (1) Geographical Terms, (2) Physical Geography, (3) Europe and the British Empire. Special: United Kingdom.
- Latin.*—(a) Pass Papers: Cæsar, De Bello Gallico IV., or Virgil, Aeneid VI. (b) Advanced Papers: one prose and one verse author from:—Cæsar, De Bello Gallico IV.; Cicero, In Verrem I.; Virgil, Aeneid VI.; and Horace, Odes III., 1-6, 9, 11, 13, 23; IV., 3, 5, 7; Epodes, 16.
- Greek.*—Lucian, Vera Historia (Clarendon Press), and Euripides, Medea (omitting the lyrical passages). Pass candidates may take either of the two authors, those for distinction must take both.
- French.*—Either "Le chien du capitaine" by Enault (Hachette), or "Waterloo" by Erckmann-Chatrion.
- German.*—"Heute mir, morgen dir," by Hoffmann (Clarendon Press).

Senior.

- Religious Knowledge.*—(a) I. Kings; (b) Acts xiii.-xxviii.; (c) Church Catechism; (d) St. Luke; (e) St. Luke in Greek.
- English Literature.*—Shakespeare's "Macbeth," together with either Chaucer's "Prologue to the Canterbury Tales" (Skeat's School Edition), or Addison, "Selections from the Spectator," edited by T. Arnold (to the end of p. 350).
- History.*—Either:—(a) Outlines of Roman History from 146 B.C. to 14 A.D., with special questions on the career of Julius Cæsar; or (b) Outlines of General European History from 1763 to 1815; or (c) English History from 1399 to 1603; or (d) English History from 1715 to 1820.
- Geography.*—In addition to general geography, a full knowledge of India and Italy.
- Latin.*—One prose and one verse author from: Virgil, Aeneid VI.; Horace, Odes III., IV.; Cicero, In Verrem I., Philippic IX.; Cæsar, De Bello Gallico IV.-VI.
- Greek.*—One prose and one verse author from: Euripides, Medea; Homer, Odyssey IX., X.; Xenophon, Anabasis V., VI.; Thucydides III. (cc. 1-50).

ITEMS OF INTEREST.

GENERAL.

As we go to press the committee stage of the Education Bill is being resumed after an interval of more than a week. At the three sittings when the Bill occupied the attention of the Committee numerous amendments were discussed at length but none were adopted, and the majorities against them were very large. At the first sitting proposals to postpone clause 1, to take elementary education out of the Bill, and to retain the School Boards in the boroughs, were rejected. On the second day Dr. Macnamara unsuccessfully moved the omission from clause 1 of the proviso declaring that the Council of a borough of over 10,000, or of an urban district of over 20,000 population, shall be the Local Education Authority for the purpose of elementary education. The third evening was spent in considering the claims of urban districts to be treated on an equality with smaller municipal boroughs. At the present rate of progress it is difficult to say when all amendments will have been disposed of, but it seems very unlikely that the Bill will be converted into an Act without an autumn session.

At the annual general meeting of the Teachers' Guild on May 31st, the retiring President, Prof. S. H. Butcher, introduced his successor, Mr. A. H. Dyke Acland, who in his presidential address dealt with the Education Bill before Parliament. While the Council of the Guild holds that the Government has provided a Bill which meets the main aspirations of the Guild, Mr. Acland had occasion to criticise many of its provisions and to indicate several directions in which he thought improvement was desirable. Following the address a discussion took place on a leaflet issued by the Council of the Guild in October last, entitled "Educational Legislation and the future of the Higher Grade School." The leaflet has roused much feeling among teachers in higher-grade schools and has evoked a strongly worded protest from several headmasters of such schools who are also members of the Guild. The discussion seemed to us to indicate some inability on the part of speakers on both sides to appreciate clearly their opponents' point of view, and to suggest that the delicate task of delimitation is one rather for educational administrators than for teachers, however earnest.

THE annual report of the Teachers' Guild provides abundant evidence of the continued activity of this representative body of teachers. Its Council and its numerous committees have all done valuable work during the year. We are glad to observe that the Council, having decided to take up the question of the curriculum in secondary schools, has instructed the Education and Library Committee to collect opinions from the branches of the Guild to form the basis of further consideration. The Council hopes to prevail on the Educational Section of the British Association to take up this important matter at the Belfast meeting of the Association this year. It is proposed later to form a committee of experts to supply teachers with authoritative views on the subject of curriculum in relation to English schools, such as have been formulated in the United States of North America by the Committee of Ten.

THE work to be undertaken by the Guild during next year has already been sketched by its Council. It is (1) to co-operate with all agencies which aim at the establishment of a thorough system of general education throughout the Empire; (2) to insist on the definite normal training of all teachers for their work, and to refuse all cheap substitutes for training; (3) to strive towards setting the holding of their posts by teachers, heads and assistants, on such a footing as may be equitable in relation to them as individuals, and sound in relation to the interests of education, which must suffer seriously if much of the best talent is diverted to other occupations by the present precariousness of tenure; and (4) to seek to get the important question of the order and relation of school studies settled in a satisfactory manner.

SINCE going to press with our last issue resolutions passed by the Associations of Assistant Mistresses and Assistant Masters upon the Education Bill, 1902, have been received. The former body calls for the inclusion of women on the local education authorities, the definite allocation of the "whisky" money to education, the removal of the limit to the rate for education other than elementary, and asks for a right of appeal to the Board of Education for governing bodies of existing secondary schools affected by the action of local education authorities. The A.M.A. welcomes the Bill, desires the omission of the option clause referring to elementary education, declares the financial provision for higher education to be inadequate, and thinks a Treasury grant should be made for this purpose, and seeks to ensure the inclusion of acting teachers upon the education committees to be established.

AT a special general meeting of the Association of Technical Institutions, held on May 29th, the resolutions in regard to the Government Education Bill recommended by the Council, which we were able to print last month (p. 224), were duly adopted, but certain others were added by the meeting. It was also resolved that a further Treasury grant for educational purposes was desirable, that a statutory limit to the amount to be expended on higher education was inadvisable, and that the majority of the Education Committees to be appointed should be elected by and from the county or county borough councils.

THE Board of Education, in order to meet the convenience of the training colleges, has given directions that the King's Scholarship Examination for 1902 shall begin on Tuesday, 16th December next, instead of on Tuesday, 9th December.

THE separate publication by the Board of Education of the "Regulations for Secondary Day Schools" will go a long way towards making secondary teachers think of the Government Department at South Kensington as a part of the Board of

Education rather than as the Department of Science and Art, which it was the "correct thing" for the secondary schoolmaster to disregard. Secondary day-schools are classified under two divisions; in the first, formerly called schools of science, not less than thirteen hours per week must be allotted to the obligatory subjects in science and art, of which not more than five hours may be allotted to mathematics. In the second division schools, there must be not less than nine hours per week of science instruction, including not more than five hours' mathematics. To schools recognised under Division I. after July 1st, 1902, grants may be obtained on each satisfactory student who has made not less than 250 attendances, in the elementary course from 70s. to 120s., and in the advanced course from 80s. to 180s. Grants will be paid to schools in the second division for each satisfactory student at the following rates:—For the first 100 students, for the 1st and 2nd year's attendance, a sum of 50s.; for the 3rd and 4th year's attendance, a sum of 70s. For students in excess of 100, for the 1st and 2nd year's attendance, a sum of 40s.; for the 3rd and 4th year's attendance a sum of 60s.

THE Board of Education has received, through the Foreign Office, an intimation that the Council of the University of Paris has decided to publish annually henceforth, in the month of April, a programme of the University lectures which will be delivered in the academic year beginning in the following November. This plan has been adopted in order to enable foreign students, who may desire to attend the lectures, to make their arrangements conveniently in advance. The programme of courses for the academic year 1902-1903 can be seen at the Board of Education Library, Cannon Row, S.W.

THE report of the Committee of the Cambridge University Day Training College for the academical year 1900-1 shows that in June, 1901, the College consisted of twenty-four students: six in the third year, six in the second year, and twelve in the first. Of the third-year students five passed Tripos examinations; one obtained a first class in the Natural Sciences Tripos, one a second and one a third class in the same Tripos, and one a Senior Optime in the Mathematical Tripos; one had before joining the College obtained a second class in the Historical Tripos. The sixth student failed in his Tripos. Of the six second-year students, three passed intercollegiate examinations, two passed the general examination and one was allowed the general examination. All the twelve first-year students passed all parts of the previous examination. Eleven students were admitted in October, 1901, so that the college now numbers twenty-nine, of whom twelve hold scholarships awarded by the Toynbee Hall Pupil Teachers' Scholarship Committee.

THE Principal of the Datchelor Training College, one of the institutions for training teachers for work in secondary schools recognised by the Board of Education, calls attention to the fact that in addition to the Senior Division which provides the professional training required for the registration of teachers, the College has two other sides. There is a Junior Division, in which the work is mainly academical, though also to a certain extent professional, and a Kindergarten Division, in which students work for the examinations of the National Froebel Union, and at the same time, if they desire it, for those of the Cambridge Teachers' Training Syndicate. We have on a previous occasion drawn attention to the Principal's excellent plan of publishing a list of Senior Students open to engagements, in which the qualifications, experience, and wants of the ladies are detailed. Headmistresses should have no difficulty in selecting suitable assistants with such a list as this before them.

AN examination will be held on October 14th next in connection with the University of Oxford School of Geography, for one geographical scholarship of the value of £60. Candidates, who must have taken Honours in one of the Final Schools of the University, should send in their names to the Reader in Geography not later than October 1st. The scholar elected will be required to attend the full course of instruction at the School of Geography during the academic year 1902-1903, and to enter for the University Diploma in Geography in 1903. The range of the examination is indicated by the contents of the following books:—Dryer, "Lessons in Physical Geography"; George, "The Relations of Geography and History"; Mackinder, "Britain and the British Seas." Questions will be set giving opportunities to students of ancient or modern history, or of natural science, who have devoted special attention to the geographical aspects of their subjects.

VISITORS to Italy have been annoyed by the universal charge of a *lira* for entrance to the national museums and art galleries, which is opposed to the custom of all other countries. Up to now only native and foreign artists have been allowed free admission; but by a recent decree this privilege has been extended to all writers on artistic subjects, professors of archaeology, history, literature and art. Foreigners have to obtain permission either from the Italian Embassy in their own country, or from their own Embassy in Italy. Those who intend visiting Rome may be glad to hear of Professor L. Reynaud's Lectures. His office is at 73, Via Due Macelli, and he has a set of three lectures, for each of which the charge is twelve *lire*, inclusive of drives.

THE London Technical Education Board is offering for competition 100 teachers' training scholarships, open to persons who desire to enter the London Training College, which will be opened by the Board next October. The scholarships give free instruction (subject to the regulations of the Board of Education) for a period not exceeding three years, together with a free place for the same period at one of the schools of the University of London. The scholarships are open to candidates of either sex who satisfy the following conditions:—(1) They must be ordinarily resident in London; (2) They must, before entering the college, have matriculated at the University of London, or have graduated at some other university; (3) They must be, or become, entitled to hold, and must during the whole continuance of the scholarship continue to hold, a King's scholarship from the Board of Education; (4) They must sign a declaration that they intend *bona fide* to adopt and follow the profession of teacher in one of the schools enumerated in the Code; (5) They must obtain a certificate from the medical officer of the college that the state of their health is satisfactory. Application forms may be obtained from the Secretary of the London Technical Education Board, 116, St. Martin's Lane, W.C.

It is not surprising that Lord Avebury does not approve the new regulations for the Matriculation examination of the London University. In a recent letter to the *University Correspondent*, he says, "To those who hold the old traditions of the University, who still cherish the principles which gave dignity and importance to our Degrees, the present change cannot but appear to be a retrograde step, and a cause for profound regret." Certainly some knowledge of scientific principles should be possessed by every cultured person. But the Senate of the University has made Latin optional, and it would appear that the new matriculation regulations are the result of a compromise between two opposing schools of thought

and this, like every other compromise, is only partially satisfactory.

THE "Addresses and Proceedings" of the Dominion of Canada Educational Association Meeting, held at Ottawa in August of last year, are before us, and show that quite as much enthusiasm for education exists in this enterprising colony as in the mother country itself. From the four hundred pages constituting the report we learn that not only were questions of educational administration discussed, but valuable contributions were made as to the proper way of teaching the subjects of the ordinary school curriculum. English teachers were represented by Mr. P. L. Gray, one of H. M. Inspectors of Manual Instruction. Dr. D. J. Goggin, Superintendent of Education, N.W.T., Regina, the President of the Association, and Mr. M. E. Conway, of Ottawa, the Secretary of the Association, are heartily to be congratulated upon the success of the meeting.

THE second volume of the Report of the Commissioner of Education for the United States of America for the year 1899-1900, has reached us. It is a bulky volume of 1,367 pages and is largely made up of statistics. The question will present itself—Who reads these reports? If American teachers have as much to do as their British colleagues, there is comparatively little time and energy left for the study of ponderous tomes of this sort, valuable and scholarly though they no doubt are. We notice that the Government of Madras has directed its attention to this very question. "Agreeably to the wishes of the Government of India the Report on Public Instruction in the Madras Presidency for the year 1900-1901 has been compressed into 45 pages as against 107 in the preceding year, but this is not thought to be enough; next year 40 pages is to be the limit." The American plan of reprinting important articles from journals in different countries has its advantages, but it certainly tends to the production of unwieldy volumes.

WE have more than once directed attention to our interesting American contemporary, *School Science*. We notice a new departure in connection with this journal which should prove of considerable value to teachers of science everywhere. The publication, as supplements to the magazine, of a series of reprints of science classics has commenced, the first being "The Analysis of Air and Water," being selections from Lavoisier's "Elementary Treatise of Chemistry." These reprints are on sale in London by the American School and College Text-book Agency. As our readers may know, the Alembic Club in this country has for some time past published similar reprints, which may be obtained from Mr. W. F. Clay, bookseller, Edinburgh.

SCOTTISH.

THE Scotch Education Department has just issued a circular making proposals for the institution of a Commercial Certificate in secondary and higher-grade schools. The circular lays it down that the main function of all schools is to give a sound general education, and that specialised instruction has little value if it does not rest upon a solid foundation of the former. Continuation schools and technical institutions are primarily designed to give specialised instruction, but the department considers that circumstances may occur in which it is desirable that pupils who have reached a certain stage of general education should receive in day schools some amount of specialised instruction, and that not merely in isolated subjects treated as additions to the normal curriculum, but according to a well-ordered scheme, and as part of the regular work of the school.

THE Department has laid down the following as the main outlines of their scheme and invite criticisms and suggestions upon

them: (1) That the certificate should be given only in schools which possess a regularly organised Commercial Department, the staff, the appliances and curriculum of which have been approved as satisfactory. (2) That it should be restricted to pupils who have obtained an Intermediate Certificate, or who have obtained four lower-grade passes. (3) That the special commercial course should extend over at least one complete year, and that to be eligible for the certificate pupils must be sixteen years of age. (4) That the principal subjects of instruction should be modern languages, commercial arithmetic, bookkeeping, shorthand, commercial history and geography, *précis* writing and business correspondence. (5) That when the special commercial course is entered upon, the instruction should be concentrated upon subjects having a direct bearing on commerce.

AT a meeting of the Modern Languages Association in the Academy at Perth, Dr. Schlapp, Edinburgh University, read a paper on the "Old Humanism and the New." An interesting discussion took place and the following resolution was adopted:—"That this association, while gladly acknowledging the aim of the Education Department in their recent circulars to organise secondary education by issuing group certificates, whether as attesting ripeness for university studies, or a knowledge of commercial subjects, respectfully indicate to the Department as serious defects: (1) That neither of these certificates meets the case of pupils, whether boys or girls, who, while not taking Latin, desire a course of education in modern subjects of equal length and comprehensiveness with that of those who are intended for the University; (2) that in circular 340 Latin is required as a fifth subject of study from those pupils who take two modern languages as qualifying subjects in the leaving certificate examination, while only four subjects are required in the case of those who take Latin and Greek; (3) that in the case of the commercial certificate (circular 358) (a) the restriction of modern language studies to one modern language, as a qualifying subject, does not encourage a course of study sufficiently extensive for those who are intended for commerce; (b) the teaching of the technicalities of commercial French and German to pupils who have not acquired a sufficiently extensive knowledge of modern languages, as attested by the previous possession of higher-grade leaving certificates, will injuriously affect the development of modern-language study in Scotland."

A MEETING of the Association of Headmasters of the Secondary Schools of Scotland has been held in the High School, Edinburgh, to discuss the new leaving certificate. Mr. Gemmell, in introducing the discussion, said that the new regulations could only have been the outcome of well informed deliberation, and that they would, if steadily enforced, effect the object for which they were framed. These regulations had been subjected to most unfair and bitter criticism by the partisans of modern languages, but the authors of such criticism must either have misunderstood the regulations or have wilfully misrepresented them. But Mr. Gemmell himself soon adopted the *rôle* of hostile critic, and proceeded to show that a scheme "so well conceived, so comprehensive, so elastic and so educational" had serious defects which, he thought, called for amendment. The reforms proposed by Mr. Gemmell did not materially affect the principle of the science group, but the omission of a modern-language group from the certificate threatens the very existence of modern-language teaching in secondary schools. Those who believe with Sir Richard Jebb "that the modern languages and literatures are worthy to be studied for their own sakes as instruments of the highest intellectual culture" are fully justified in the determined opposition they are offering to what they consider reactionary and retrograde proposals.

AFTER ten years' experience of the working of the regulations laid down by the University Commissioners for the government of the Scottish Universities, a general feeling has arisen that the time has come for discussion with a view to extend and amend them. This feeling doubtless has been intensified by the princely benefaction of Mr. Carnegie, which has removed what has hitherto been the chief obstacle to the reconstruction of the University system, the want of resources. A protracted discussion regarding reform of the curriculum in Arts has been proceeding for some time within the University of Edinburgh. A public report of the discussion and of the conclusions which were arrived at has been prepared by Professor Chrystal, Dean of the Faculty of Arts, and has been issued to the public. We hope to take an early opportunity of referring to it at greater length.

THE Educational Handwork Association of Scotland was formed in 1892 for the purpose of promoting manual work in schools. During that time much has been accomplished. The importance of hand and eye training is now universally acknowledged, and the Scotch Education Department is giving every encouragement to the new movement. The Association has organised courses of instruction for teachers in manual work, and their certificates have been officially recognised by the Department. The demonstrations, exhibitions and conferences which they have organised in different parts of the country have been of the utmost value to teachers and to the general public in illustrating the possibilities of the different branches of manual work and their suitability for school purposes.

WELSH.

AT the last meeting of the Court of the University of Wales Regulations for the Certificate Diploma in Education were received from the Senate, and approved for the next Session. A syllabus founded on the Regulations, if presented by the Colleges, was approved for 1902-03, on the recommendation of the Senate. The syllabus was as follows:—*I. Practical Work*: (a) class teaching in schools under qualified supervision; (b) teaching exercises (including preparation of illustrations, apparatus, &c.); (c) visits of observation to schools of different types; (d) demonstration lessons and discussions. *II. Theoretical Work*: (a) general theory—(1) the child's physical, intellectual and moral development; (2) the doctrine of educational ends; (3) the relation of the school to society; (b) development of educational ideas and the work of great educators since 1760; (c) method—(1) general; (2) for special subjects—education values of the various subjects forming part of the school curriculum; (d) school organisation, including curricula, and school hygiene.

THE Departmental Committee of 1881 reported that there were 27 endowed secondary schools for boys in Wales: 13 in North Wales, 11 in South Wales, and 3 in Monmouthshire. There were, at the same time, but three endowed schools for girls. Of all these endowed schools, Ruthin, Brecon and Llandovery alone have been continued outside of the Welsh Intermediate Education Act of 1889. Whether the thirty endowed schools had any interesting history or not it is difficult to say; but it is a pity that, however scanty the records may be, they have not been collected as a whole for permanent consultation. Probably, however, one of the most interesting schools, historically, in Wales, is the Friars School at Bangor, and it is extremely fortunate that that school has now found historians in Mr. Henry Barber and Mr. Henry Lewis. Mr. Barber writes on the coming of the Friars and the foundation of the school in the sixteenth century. Mr. Henry Lewis, starting from 1658, takes up the history to 1899, the time of the laying of the

foundation stone of the new building. The statutes of the school date from 1568, and Dean Nowell, of St. Paul's Cathedral, had a hand in their drawing up.

ONE of the special difficulties for an English teacher to contend with in a Welsh school is to distinguish children, through the restrictedness of surnames. Mr. T. E. Morris recently brought forward before the Cymmrodorion Society a plan for reform. He instanced the fact that in Liverpool there were as many as 431 John Joneses, and that the Corwen Board of Guardians passed a resolution last July that each John Jones, of which there were twelve on the Board, should be distinguished by the addition of name of house and parish. Amongst the Welsh clergy there are 15 named David Davies, 13 Thomas Davis, 17 David Jones, 20 John Jones, 22 Thomas Jones, 17 William Jones, 20 John Williams. The remedy suggested was a short Act of Parliament enrolling any person who desired to change, or had changed, his surname, to register such change in any office for the registration of births, marriages and deaths, on payment of a small fee. Old Celtic names such as Bryn, Elvet, Emrys, Ffrangcon, Keri, Towyn, &c., are available. It may, however, be said that the ingenuity of discrimination between different persons of exactly the same name gives a certain mental discipline to the Welsh boy and girl.

THERE has been held at Rhyl a historical exhibition of considerable interest. The first intention was to exhibit specimens of needlework, but the idea grew until a most comprehensive collection of articles was brought together, illustrating history, as the opener, Lord Mostyn, said, from the Roman occupation to the Victorian era. Amongst the exhibits were: portraits, old prints and MSS., old swords and armour, gold and silver coins, carved oak, 18th century costumes. Special loans consisted of an old copy of the death warrant of Charles I., a handkerchief stained with Charles I.'s blood, commission by Queen Elizabeth for the holding of the Eisteddfod at Caerwys in 1568, the Charters of that borough, the old silver harp of the Eisteddfod, and a suit of armour said to have been worn by Owain Glyndwr. The catalogue of the collection is thus permanently interesting and valuable, as it contains a list of treasures, hardly known, as a whole, to both Flintshire and Denbighshire. Historic articles of various parts of the counties were brought together, and Prof. Boyd Dawkins gave a lecture on "The Prehistoric Inhabitants of Denbighshire and Flintshire."

CURRENT HISTORY.

IN the article on the Coronation which appeared in our last number, there is a little clause which our readers, seeing it for the first time long after it was written, will probably have tacitly deleted. On June 1st, the "Boer war" was "settled on the South African veldt." The "treaty of peace," or "terms of surrender," as the document may be variously called according to the point of view, is curious in many ways, regarded as a contribution to international law. To take only one instance, Cape "rebels" are treated differently from the burghers of the Transvaal and Orange River districts. Yet these were, by proclamation, "annexed" in May and October, 1900, and according to old ideas, their inhabitants in arms against the Brito-Irish forces were technically as much "rebels" as those of Cape Colony. Yet they treat as "belligerents." The world is advancing, even though war still exists. And there is even more interesting news from South America. The South African war has made the Hague Conference ancient history, and we have not yet heard of any great amelioration in Europe as a consequence of that Congress; but Chile and Argentina have made a treaty to settle their differences; they

have at least countermanded their orders for new battle-ships, and have agreed to refer all their disputes to the King of Great Britain and Ireland. Couple this with the Scandinavian news to which we referred last month, and we might almost be tempted to say the Millennium is coming—in dribbles.

SOME folk in the U.S.A. objected to the sending of a special ambassador to represent their country at the coronation of Edward and Alexandra, on the ground that King Edward was a "hereditary" monarch. The objection suggests certain obvious reflections as to their idea of international etiquette, but we call attention rather to their ignorance of English history. When has the throne of this country been "hereditary?" It sounds, no doubt, paradoxical at first sight to say so, but there have been only two English monarchs whose claim to rule was based on the right of birth. We do not deny, of course, that of many English kings it may be said, "and he was gathered to his fathers and his son reigned in his stead," though the number to whom this is strictly applicable is fewer than is generally thought. Edward II. and Charles I. are cases in point. But of the nearly forty sovereigns "since the Conquest" only Edward IV. and James I. have succeeded, *as against other claimants* because they were in the same position towards the English crown as an heir-at-law is to the estates of his ancestor. Of the "illustrious House of Hanover" it should be notoriously true that they are as really the elected chiefs of the Brito-Irish nation as any president of the U.S.A. The only difference is that we made our election long ago, an election which will stand so long as there are Protestant heirs to that Sophia, Electress of Hanover, whose death in 1714 so narrowly preceded that of Anne Stuart.

SINCE the celebration, sixteen years ago, of the eighth centenary of the Norman Domesday Book there has been much new light thrown upon that venerable, interesting, but hitherto little understood document. And the consequence is that many old theories as to the social conditions of our forefathers have passed away, and a more exact knowledge has taken their place, based on patient cross-examination and collocation of facts. It is becoming more certain now than ever that our early village communities cannot possibly be derived from the Roman *villas* or slave estates, and that, on the other hand, they never had property in common, but that from the beginning each head of a household had certain lands as private property and certain joint rights over pasture and wood. The "mark" has disappeared from our text-books, and "manors" are found to be a growth of the eleventh century. "Folkland" no longer means "land belonging to the folk," but "private property held by folk law." Much help towards understanding the condition of eleventh century England is gained by comparison with the condition of the village communities still existing in Russia and other countries, and it is therefore interesting to note that the Czar's officials are proposing to hold each individual henceforth responsible for his own taxes, and no longer to throw the burden of paying the taxation of a defaulter on the village community to which he belongs. With the new individual responsibility, it is expected there will be new individual freedom in the Russian empire from old village restrictions.

A STATUE of Marshal Rochambeau, who fought for the American colonies in 1778-83, was unveiled recently at Washington. And there were on that occasion many compliments passed between the Republics of France and "America." President Roosevelt welcomed the French Embassy as coming "at the very time when we in our turn have done our part in starting on the path of independence the new Republic of Cuba." Three days previously, M. Loubet was assuring the mayor of S. Petersburg that "the hearts of Russia and France

were beating in unison." What a curious concatenation of ideas! The absolute monarchy of France, in order to avenge itself for the treaty of 1763 and the loss of Canada, as well as for the help given by the monarchico-oligarchic government of Great Britain to the Corsican "patriots," helped the English colonies in America to gain independence of the mother country. France is now a "republic," and the two "republics" congratulate one another on "their" past and recent achievements in "republic"-making. Yet, at the same time, one of these same "republics" is declaring its bosom friendship for the "autocratically"-governed Empire of Russia, while the other is sorely puzzled to know what to do with a proposed gift of a statue of Frederick the Great of Prussia which that absolute monarch's modern representative has offered to the U.S.A., and which he thinks they will accept because Frederick refused, out of spite against Great Britain, to help her in any way put down the American "revolt." What *do* "republics" think of "absolute monarchies"?

RECENT SCHOOL BOOKS AND APPARATUS.

Modern Languages.

A. de Musset, Trois Comédies. Edited by Kenneth McKenzie, Ph.D. xiv. + 144 pp. (Heath.) 1s. 6d.—The three little plays are *Fantasio*, *On ne badine pas avec l'amour*, and *Il faut qu'une porte soit ouverte ou fermée*; they are better suited for private reading than for classwork. The biographical introduction is adequate; but the notes are meagre: for example, there is no reference to Boileau when *Fantasio* remarks that "*un sonnet vaut mieux qu'un long poème*" (p. 13); no comment on the peculiar construction *avec des mystères plein ses poches* (p. 37). Such vague indications as in the note "*coup*, drink, one of many meanings," are of no value. The "American" note—"lavoir, the public basin or fountain often seen in the chief square in a European village, where the family washing is done"—is delightful.

R. D'Alissas (M. & K. Roget), Les Histoires de Tante. Edited by the Authors under the direction of F. F. Roget. 131 pp. (Macmillan.) 1s. 6d.—These eight short stories, well printed and very creditably illustrated, are for children of the same age as those whom Mrs. Frazer's well-known scenes of child-life have delighted; and they may indeed challenge comparison with these books. The vocabulary is complete as far as we have tested it; it even gives each form of the verbs to be found in the text. The notes supply idiomatic renderings where necessary, and comments on the grammar, often in language which is too technical. We have noticed no slips in the printing of the text. The statement in the note on p. 5, line 13, that the *t* in *trouve-t-elle* is a "remnant of the older conjugation" is, of course, incorrect.

Madame de Sévigné. Select Letters. Edited by M. F. Vernon Harcourt. 40 pp. (Blackie.) 4d.—This brief but good selection deserves a wide circulation, especially in girls' schools. The notes give just the requisite amount of information; we have noticed very few slips. In the note to p. 11, l. 20, it should be *je n'entends point*; on p. 18, l. 10, read *ouvert*; and omit hyphen after *très* (passim).

Paul Heyse, Hochzeit auf Capri. Edited by Dr. Wilhelm Bernhard. xii. + 128 pp. (Heath.) 1s. 6d.—The introduction

tells us that the "sapphirine blue skies," &c., make Capri a "delightful sun-spot," and that "the light winds bring whiffs of spicy fragrance"; it used to be "inhabited" by Greeks, and the "long, large eyes" of the girls of Capri are "soft and lustrous," and their teeth "white as the kernels of fresh filberts." To make us yield still further to the charms of Capri, there is a "poem" by "W. Wordsworth," dated 1888. At last we reach the text of Heyse (*sic* the title-page): it is by no means one of his best stories, very slight in texture, and but little suited for class-reading; it has above all the great disadvantage of representing Italian, not German life and ways. The notes are fairly full, but not in any way remarkable; the vocabulary appears to be complete.

Amigos y Auxiliares del Hombre. Cuentos compilados por S. J. Eddy. vi. + 161 pp. (Ginn.)—The object of the compiler of these animal stories has been to interest children in the brute creation, and make them kind and thoughtful in their dealings with household pets and other creatures with which they may come in contact. The stories are charmingly told, and extremely well illustrated, often by photographs from life. But the fact that the book is written in Spanish will make the English sales very small indeed, and we would suggest to the publishers that they might well issue a translation into English. We cannot afford to make room for Spanish in the already overcrowded curriculum of our secondary schools.

Classics.

The Annual of the British School at Athens. VII. 1900-1901. vi. + 190 pp. (Macmillan.) 10s. 6d.—Mr. Evans's report on further excavations at Cnossos forms the chief part of this volume. The discoveries, if they have not the sensational novelty of the first, are in themselves hardly less remarkable. New deposits of the inscribed tablets have come to light, and one of the tablets is the largest found so far. Unfortunately, no bilingual inscription has turned up, so that the prospect of deciphering the contents is no nearer than before. Fragments of frescoes appear everywhere; one of them depicts a girl with curly hair, interesting although not nearly so fine as the now famous cup-bearer. A seal bears the representation of a goddess mounted upon a heap of rocks and flanked by two lions. Other strange devices occur, but not a trace of the "Cretan Zeus" whom Mr. Evans still, in spite of practical demonstration to the contrary, persists in supporting. A number of the store-chambers have been explored, yielding traces of treasure in one or two instances. We have no space even to enumerate the interesting objects discovered, but we must call attention to a beautiful piece of inlay which appears to have been a kind of backgammon board. The plan of the palace is fairly complete, and part of the upper storey can be made out. One spacious hall has the bases of a number of columns *in situ*. On the walls the usual signs are inscribed, and from these Mr. Evans calls it the Hall of the Double Axes; he observes that the walls were covered with stucco, but does not draw the natural conclusion that the signs hidden behind the stucco were not important. A second paper describes the discovery of a Mycenaean town at Zakro by Mr. Hogarth; but we cannot do more than mention that his finds were various and interesting. The book is full of good things, and is indispensable to the student of the Mycenaean age.

Sophocles. Tragedies and Fragments. Translated by the late E. H. Plumptre, D.D., Dean of Wells. With notes, rhymes, choral odes, and lyrical dialogues. 2 vols. 243, 255 pp. (Isbister.) 5s. net.—Messrs. Isbister have followed up their edition of Dean Plumptre's "Aeschylus" with his "Sophocles." The merits of the translation are well known,

and it has won an honourable place for itself among metrical versions of the classics. The style is simple and clear, though, of course, much of the charm of the original is untranslatable. We do not think it is so good as Whitelaw's "Sophocles," but it is a good second, and will give the general reader a fair idea of the author. Plumptre has the advantage over Whitelaw that he includes the "Fragments," 780 in number. Plumptre is more successful in his rhymed odes than in the unrhymed. It is hardly necessary to criticise details in a reprint, but we would point out that the note on *i.*, p. 26, which states that the Greeks habitually grouped deities in threes, is quite untrue.

Virgil, Georgics I, IV. By F. G. Plaistowe and G. Norwood. 105 pp. (W. B. Clive.) 3s. 6d.—The introduction, which is brief and clear, contains an exposition of the astronomical terms used by Virgil, and the meaning of "rising" or "setting" of stars, which is both useful and not generally to be found in books. What with notes, index, proper names, and metrical appendix scanning all difficult lines, the candidates for the London Intermediate ought to be able to get up their book without a teacher. Apparently they have to be told when to turn up the index of proper names. The notes are good, but for those who have a teacher too full. We do not understand, however, the structure of the plow on p. 59; it looks like a model cast in metal.

Caesar, Gallic War, VI. Edited by John Brown, B.A. xlvii. +106 pp. (Blackie.) 1s. 6d.—We have had occasion before to refer to Mr. Brown's edition of Caesar with commendation. This book is of like plan and execution with the others, with the usual Introduction on the author and his times, the Roman army, and Roman books. There are good photographs of Caesar, Pompey and Stonehenge, with a large number of smaller pictures, many imaginary. The notes are more judicious than those of most modern schoolbooks, but still, too often we find such a comment as "*primo vere*, in the beginning of spring," "*praeter spem*, contrary to their expectation."

Greek Prose Composition. By S. O. Andrew, M.A., Headmaster of the Hulme Grammar School, Oldham. x. +275 pp. (Macmillan.) 3s. 6d.—The Introduction to this book gives characteristic differences of idioms between Greek and English, under such headings as Concrete and Abstract, Metaphor, the Parts of Speech, Periphrases, Syntactical Usages, the Period, Particles and groups of Particles, Order of Words. The first 49 exercises are set on special parts of the Introduction; and some passages are analysed carefully as to structure, and translated, for specimens. In the second part, pieces of classical Greek are given as models, and then English of similar content or style, again with versions now and again. Hints are given before the exercises on various styles of composition: dialogue, oratory, character, and so forth. There is also a vocabulary. This book may be begun when the pupil knows the ordinary syntax and accidence. It is very well done, and we can give it hearty praise.

The Georgics of Virgil. Book III. S. C. Winbolt, M.A. xxxii. +95 pp. Without vocabulary. (Blackie.) 1s. 6d.—It is often our unpleasant duty to call attention to badly annotated schoolbooks; the annotation of schoolbooks, which really calls for unusual judgment and experience, being nowadays entrusted to Tom, Dick, and Harry. We are the more gratified when we light upon one which is really well done; and such a one is Mr. Winbolt's "Georgic." In speaking of his editions of the earlier books we have called attention to the value of the *Introduction*, especially that part which relates to the metre, of which Mr. Winbolt has made a special study. This Introduction is repeated here. We need only add that

the notes are good all through. One or two points might be improved. The stone of Sisyphus did not "fall back on him" (39); no passive sense should be imported into *ante domandum* (206), which means "before taming," the gerund being the verbal noun; *pernix* (230) is rather "enduring" than "persistent"; and something more might be said of the short form *erunt*, in 3 pl. pf. indic., than that it is a "metrical convenience." Apart from these trifles, we have only praise for this edition. Some of the illustrations are very good, notably the vase on the frontispiece.

Edited Books.

English Tales in Verse. With an Introduction by C. H. Herford. 291 pp. (Blackie.) 3s. 6d.—The workmanship of this series is so excellent, the aim so good, and the outward garb of each so dainty, that it is a joy to possess the books already issued in it. The introductory essay to the present volume is learned, and yet lucid, readable, and brilliant. No one can really vie with Professor Herford in discussing topics of this kind, and, unlike some other professorial persons, he never fails to say something new as well as something true; consequently, as a critic in the rank where grammatical and antiquarian lore furnish the basis and the poetic insight of pure literary genius is not quite attained, he holds a very high position. Many passages, indeed, in this Introduction are of the most suggestive kind, sometimes perhaps a little over-written. But slight matters apart, this essay is delightful reading, and accounts in a scholarly vein of criticism for a very important literary form. The "Tales in Verse" are then illustrated by five from Chaucer, one from Shakespeare, two from Dryden, three from Crabbe (most happily included), two from the ubiquitous Wordsworth (who worked this vein to death), by the "Lamia" and "Isabella" of John Keats—both beautiful modern examples—and last, but not least, by William Morris's "Love of Alcestes." When will Morris, apart from the recognition of scholars like Professor Herford, receive the honour due unto his name?

The Master of Ballantrae. Edited by T. Cartwright. 134 pp. (Cassell.) 1s. 6d.—The purpose which this book is intended to serve is an exceedingly limited one. It is intended for pupil teachers and scholarship students. There is some introductory matter, printed for the purpose (one thinks) of spoiling a pupil teacher's eyesight even in summer time; it includes a life of Stevenson which is not at all unreadable, and some inevitable remarks upon his style, which are; a poorly-printed text, and a voluminous collection of notes and a glossary. Pure philanthropy forbids us to recommend a volume which will do much to ruin the eyes of a class who already suffer in numerous instances from ophthalmic diseases, on any ground except that it is very cheap.

Quentin Durward. By Sir W. Scott. With Introduction and Notes. 678 pp. (Macmillan.) 2s. 6d. *Kenilworth.* By Sir W. Scott. With Introduction and Notes. 704 pp. (Macmillan.) 2s. 6d.—There is comparatively little to remark about these two volumes, except the general excellence of the edition and the enormous halfcrown's worth which a reader gets in either of them. For the most part, Scott is allowed to tell his own tale quite in his own way. The editorial labours have been confined to brief but good introductions, and a supply of educationally valuable notes to supplement those of Scott himself, which are so well known to all readers of his novels, and in some cases almost as dearly appreciated by them as the text itself. Altogether this edition is to be unreservedly commended as supplying school reading-books which ought to stimulate a healthy interest in the works of Sir Walter Scott.

Shakespeare's Macbeth and the Ruin of Souls. By Dr. W. Miller, C.I.E. 126 pp. (G. A. Natesan, Madras.) 1 rupee.—It is only a short time since a companion booklet to the present came from Dr. Miller's pen with the startling purpose of connecting "King Lear" with Indian politics; and we noted that seeming incongruities did not in the least hinder Dr. Miller from writing a very able essay. In this more recent issue the Doctor returns to battle, and again his title is lurid and staggering. "Macbeth" and the "Ruin of Souls" is a stupendous combination, but when a careful reader has read this little volume too, he will but reinforce his opinion that Dr. Miller is a commentator upon Shakespeare of a new style perhaps, but of peculiar ability, and as readable as he is original in his design.

Tales from the Faerie Queens. Told by Clara L. Thomson and illustrated by Helen Stratton. 181 pp. (The Norland Press.) 2s. 6d.—The excellence of Miss Clara L. Thomson's work, of which we have already had several occasions to speak, is continued in this volume, and the supplementary excellence of Miss Stratton's illustrations is quite as noteworthy; in fact, the two elements together are combined in a volume which is much too good merely for use as a reading book. The story adheres with severe closeness to the narrative of Spencer's poem, and is well told; while numerous quotations form part of the text, and ought to stimulate some pupils of the better sort to go to the poem itself. The illustrations include a fine reproduction of Mantegna's *Saint George*, but Miss Stratton's own are artistic and suggestive, showing distinct individuality and power. Altogether a very charming volume.

Boswell's Journal of a Tour to the Hebrides. By H. B. Cotterell. 363 pp. (Macmillan.) 2s. 6d.—This delightful volume of the inimitable James has now been reduced to the service of literary education by inclusion in a series which, by its thoroughgoing scholarship and dignified treatment, lifts all volumes included in it almost to a place apart, and the editorial care which Mr. Cotterell has expended upon this celebrated "Journal of a Tour to the Hebrides," even down to the excision of certain passages which "seemed unsuitable for the object in view," is manifestly very great. The biographical sketch of the Laird of Auchinlech, with which the volume opens, is a thoroughly literary composition, and well worth reading for other than school purposes. The notes are neither voluminous nor numerous, but they are serviceable and well done.

Samson Agonistes. By E. H. Blakeney. 129 pp. (Blackwood.) 2s. 6d.—From first page to last, everything testifies to excellent scholarship and editorial care, and the spirit in which Mr. Blakeney has executed his task is, perhaps, indicated in the inclusion of three tributes "To Milton"—from Wordsworth, Tennyson, and, best of all, from Emerson, as a kind of literary dedication. The introduction is far too short. So well written is it that it seems a pity the editor should have been controlled in the disposition of his space. Illustrations are wanting, but the notes are a joy to the critic, and they are worth careful study.

The Book of Exodus. By the Rev. F. H. Stewart. 146 pp. (Rivingtons.) 1s. 6d.—Another excellent and scholarly volume in a series which justly holds high rank among school editions. Mr. Stewart has evidently spent much pains in condensing the matter of his introductory sections, which cover a great deal of unfamiliar ground in a very little editorial space. The notes are few in number, and there are only two appendices.

Shakespeare's Henry IV. By H. W. Ord. 124 pp. (Black.) 1s.—This edition maintains the general reputation of Messrs.

Black's School Shakespeare for conciseness, literary criticism, and practical usefulness. The sections dealing with the character and interpretation of the play are very good, and the notes are useful. It is serviceable for its stated purpose in preparing students for examination; but it would be a pity if so much excellent suggestiveness should end in so poor a literary result.

Henry V. 166 pp. (Blackie.) 1s.—It is not quite easy to decide in one's mind exactly in what forms a book of this kind would be most serviceable. The introduction is a trifle, the illustrations are not too numerous, nor very fine either. The notes are better than in the volume of this series recently reviewed, and the critical appreciation is a good way over the heads of those juniors for whom the volume would appear to be intended.

The Gospel according to S. Mark. By A. E. Rubie. 123 pp. (Methuen.) 1s. 6d.—This is an attractive volume in a series which ought to achieve considerable success. It may be gravely questioned whether the Bible, like Shakespeare and Scott, is not being overdone as the foundation of unending editions; but, if all volumes meet the demand as well as this manages to do, it would be well for various publishers. The illustrations, the appendices, and the examination papers are alike excellent.

Little Poems for Little People. Chiefly by Edward Shirley. 64 pp. (Nelson.) 1s.—These trifles have much to recommend them as material for recitation in the case of very young children. The verse is excellent from a technical point of view, though there is nothing in it that can be called poetic. They will serve for establishing a sense of correct rhythm, and to this characteristic must be added an amusing quality which will assist in their appeal to juvenile intelligences.

Questions and Notes on "A Midsummer Night's Dream." By Stanley Wood. 56 pp. (Heywood.) 1s.—This useful series is now so well known that detailed criticism of this its most recent addition is superfluous. Mr. Stanley Wood's work in this line is always distinguished by accuracy and comprehensiveness.

Questions on Shakespeare's "Midsummer Night's Dream." By George Carter. 39 pp. (Relfe.) 1s.—These questions are admirable, careful, and stimulating. They cover all the educational aspects of the play in a comprehensive fashion.

History.

A Guide to the best Historical Novels and Tales. By Jonathan Nield. viii. + 122 pp. (Elkin Mathews.) 5s. net.—This book is indispensable for all teachers who believe in the educational value of historical fiction. It contains an interesting introduction, a classified list of the best historical novels and tales, suggestive courses of reading for boys and girls, and an extensive bibliography of the subject. Though Mr. Nield does not appear to be himself a teacher or primarily interested in education, he displays considerable insight into the needs of the teacher and shows acquaintance with various educational books and papers which would naturally be outside the ken of the mere literary man. The only faults which we have to find with the book are, first, that the subject matter might often be more fully indicated without prolixity; secondly, that its price may put it beyond the reach of many who would find it useful and be glad to have it; and, thirdly, that there is no index, either of authors or books. The book shows one at a glance all the best novels dealing with any given period; but, if one wants to find out with what period any book deals, he must needs turn over some 80 pages of tables. To search for one

novel (of unknown subject-matter) in a list containing 900 entries is rather like "searching for a needle in a bundle of hay." We heartily commend the book to our readers: it combines the excellences of a useful work of reference and a dainty gift-book in quite an extraordinary degree.

Geography.

The Wide World. vi. + 122 pp. *Northern Europe.* vi. + 122 pp. (Ginn.) 1s. each. *Africa.* 166 pp. + 12 coloured maps. (Blackie.) 1s. 6d. *Africa and Australasia.* vii. + 279 pp. (Macmillan.) 1s. 6d. *The Australian Commonwealth.* 144 pp. (Arnold.) 1s.—No better evidence of the great advances that are being made with respect to the study of geography could be furnished than the improvement that has taken place in geographical Readers. It is no longer considered sufficient that a Reader should be interesting—there is such a thing as accuracy and scientific treatment being sacrificed to mere picturesqueness. Every new geographical Reader that appears seems to vie with its predecessors in treating geography as something not merely of great human interest, but as a subject of mental discipline also. In other words, the causal, idea is becoming more and more prominent, and, in this respect, the five Readers now before us are well worthy of commendation. Another point to which careful attention is being given is the character of the illustrations: here, again, there has been great improvement. Yet a third point is the careful graduation of the text-books, and the adaptation of the writer's style to the requirements of boys and girls of various standards.

"The Wide World" is a strongly-bound little book that presents in concise yet vivid manner the habits of children in various lands. It consists of selections from the writings of American teachers and others. Some of the headings of chapters are:—Bavarian Babies, The Boys of Mexico, A School in Cairo, A Japanese Home. "Northern Europe" belongs to the same series, and carries out the same method in greater detail; it deals with European countries north of the Alps. We have on several occasions recommended Messrs. Blackie's Continental Readers; the "Africa" is quite equal to any of the others, and, in one respect, we think, is the best of the series—the excellence of the coloured illustrations is beyond criticism, the coloured photo of the Victoria Falls being especially good. On the other hand, the relief map of South Africa is scarcely as clear as it should be. The "Africa and Australasia" member of Messrs. Macmillan's "New Geography Readers" series is a well-written book, and the treatment throughout is scientific, the broad principles of geography being illustrated in every chapter. In both these readers there is a useful summary at the end. The "Australian Commonwealth," like all the others, is well illustrated, but its only map is a coloured one of the continent. The chapters dealing with the history of the Commonwealth, its explorers and the voyages from the British Isles, are very good, but the whole is a most instructive little book—accurate and up to date.

British Isles. 184 pp. *Europe,* including the British Isles. 236 pp. By L. W. Lyde. 1s. 4d. each. (Black.) A boy using these two books will not be long before he realises that geography is not a list of names and figures. He will see that climate and position account for most of the facts of every-day life, and with a good atlas in front of him will learn more of the geography of Europe in a week than he would in a term from the old style of geography text-books. A special word of praise must be given to the beautifully clear illustrations with which the two books are provided. The style is essentially logical; open the books where you will, the formula continually recurs—"as . . . therefore . . ." Admirable Readers in every respect.

Grammar and Composition.

A First Course in Analysis and Grammar. By Richard Wilson, B.A. 143 pp. (Arnold.) 1s.—There are several points in this book that deserve commendation; the definitions of the parts of speech are clear, the arrangement of the lessons is good, there are numerous exercises, and, as far as we have been able to judge, the information given is up to date and accurate—two qualities that are not always present in text-books of grammar.

Applied English Grammar. By E. H. Lewis. xii. + 163 pp. (The Macmillan Co.) 2s.—Professor Lewis's text-books have more than once been favourably noticed in these columns. The one now under notice is an attempt to apply grammatical principles to the every-day use of language. There are two parts: Part I. contains the elements of conversational English; in Part II. a more systematic treatment of English grammar is given, beginning with the sentence. The book is, without exaggeration, a really excellent one. We advise all teachers to procure a copy, and, unless we are greatly mistaken, they will soon adopt it for use in their classes.

Science and Technology.

Elementary Treatise on Physics. Translated from Ganot's "Éléments de Physique" by Prof. E. Atkinson. Sixteenth edition. Edited by Prof. A. W. Reinold, F.R.S. x. + 1,137 pp. (Longmans.) 15s.—We suppose every teacher of physics knows and respects Ganot's "Physics." For many years it has been the custom of boys studying this subject to look forward to the time when they will each possess a copy of this attractive and beautifully illustrated volume. But what is true of every branch of science is especially so in the case of physics: the rapid march of discovery makes necessary all sorts of revision and modification if a volume on the subject is to continue a trustworthy guide to the wonderland continually extended by an army of researchers. It is the best tribute that can be offered to Ganot's "Treatise" that it has been possible to maintain the original character of the work and yet to add the necessary information respecting recent developments to bring the book up to date. Thanks to Prof. Reinold's editing, the sixteenth edition of the treatise is likely to retain and augment the army of admirers and readers of "Ganot."

More Tales of the Birds. By W. Warde Fowler. Illustrated by Frances L. Fuller. 232 pp. (Macmillan.) 3s. 6d.—Mr. Warde Fowler's "Tales of the Birds" won a well-deserved popularity, and this second series seems to us even better written. The tales are told in language simple enough for the youngest of readers, and yet they possess a literary grace to which the oldest can hardly remain insensible, though he may find it difficult to define. To ascribe to birds the foibles and sentiments of mankind may not be very scientific, but it is done here with very happy effect. One lays down the book with the feeling that he has had a glimpse of the world from the birds' point of view, and with a conviction of the reality of the tragedy and comedy of bird life. A book so well calculated to arouse latent interest in birds, and to give a sympathetic insight into their habits and instincts, is to be unreservedly commended. A word of praise must be given to the eight full-page illustrations.

Junior Chemistry and Physics. By W. Jerome Harrison. 224 pp. (Blackie.) 1s. 6d.—Mr. Harrison is already well known as a writer of elementary books of science. He tells us in his preface that the subject matter of each chapter was repeatedly given as a science lesson to large classes of children of from ten to sixteen years before writing it out. The book is,

then, the work of a practical teacher, though it is written throughout on the old lines of telling everything and leaving the pupil to find out nothing; it is, in fact, encyclopedic in the amount of information it provides. But this is not the way to teach science. It is not well to give children, to begin with, lists of the elements with their symbols and simply to explain the symbols as a kind of shorthand. Nor is it well, after describing the preparation of oxygen, to add this paragraph, "The following equation represents the chemical change produced by the heat—



for nothing has previously been said by way of explaining what a chemical equation is, and the one given does not correctly represent the changes which take place when potassium chlorate is heated. The diagrammatic representation of the sugar molecule on p. 76 will, with the knowledge possessed by the learner, give an erroneous notion. But details apart, we believe the method of the book has rightly been superseded by a more rational teaching of science which sets the child in the attitude of a discoverer and estimates more highly the training of the mind than the mere acquisition of facts.

Rural Readers: Senior. By Vincent T. Murché, F.R.G.S. 292 pp. (Macmillan.) 1s. 6d.—We have previously spoken highly of the earlier volumes of this series. The present one is on the same plan: a story describing the doings and sayings of three boys and their farmer-mentor in the country. It first deals with farm methods as carried out at various seasons of the year, and then goes on to describe the animal and vegetable life of the country. The style is attractive, and the book is well illustrated by numerous cuts and coloured plates. Some of the latter are very beautiful. One or two errors ought to be rectified in future editions—e.g., "the pupa (of a gnat) hangs head downwards in the pool" (p. 160); a young frog's "elegant tail tumbled off entirely in a shrivelled-up state" (p. 213); and "the spores which come from the spore-cases are the seeds of ferns" (p. 292).

Mathematics.

An Arithmetic for Schools. By J. P. Kirkman, M.A., and A. E. Field, M.A. x. + 430 + liv. pp. (Edward Arnold.) 3s. 6d. (with or without answers).—This belongs distinctly to the better class of text-book, and deserves a favourable reception. There is actually an appendix on the use of squared paper: the examples are both practical and interesting, and the explanations given are clear. In some cases a worked-out example is given in a form which shows the reasoning well enough, but omits the computation, or gives it in an awkward form. It would be an advantage to give the actual computation, properly arranged, lower down on the page, after the explanatory matter. We think, too, that in the questions on interest, percentages, &c., the practical value of decimals is not sufficiently brought out: many of the examples are worked by vulgar fractions, and come out neatly merely because the data are artificially assigned.

A Second Arithmetic. By W. T. Knight. vi. + 90 pp. (Relfe.) 8d.—Mr. Knight gives far too many tiresome and fantastic examples, such as the following: "One clerk has 24'428571, and a second clerk has 38½ sheets to engross; they call in a third clerk, and agree to divide the work equally among the three, and to pay the third clerk at the rate of 24305 shillings per sheet. How much will he receive from each of them?" In other respects his work is passable, without special features of any kind.

Easy Mathematical Problem Papers. By C. Davison, D.Sc. 120 pp. (Blackie.) 2s. 6d.—A graduated series intended for pupils of about seventeen. The range covered is arithmetic, algebra to the binomial theorem, Euclid, and elementary trigonometry. In the earlier papers alternative and easier problems are given. The collection is something like Milne's "Weekly Problem Papers," but easier, and may be recommended.

Woolwich Mathematical Papers for the Years 1892-1901. Edited by E. J. Brooksmith, B.A., LL.M. (Macmillan.) 6s.—A reprint of a very useful and sensible collection of papers, especially those set in recent years.

Algebra. Part II. By H. G. Willis, M.A. viii., 177-376, liv. pp. (Rivingtons.) 1s. 4d. (without answers, 1s.).—As in Part I., the exercises are arranged in sets, each suited for about an hour's work: most of them are in pairs of quite similar type; and examination papers of various degrees of difficulty are inserted at intervals. The range covered is from factors to progressions. Merely fanciful examples are rather frequent; but if used with discretion, this will be a serviceable class-book.

Plane Geometrical Drawing. By R. C. Fawdry, M.A. xii. + 186 pp. (Spon.) 6s.—This book is intended mainly for Army candidates, but could very well be used in schools. There are numerous worked and unworked examples, mostly taken from Army papers, and ranging from elementary problems of construction to the copying of geometrical designs. The directions are clear, and the work seems well adapted for its purpose. Except for examination requirements, the methods given in this and all such books for drawing regular polygons are quite useless; why not give the general method by means of the protractor?

The Story of Euclid. By W. B. Frankland, M.A. 176 pp. (G. Newnes.) 1s.—This is an entertaining and trustworthy book, which has evidently been a labour of love to its author. Beginning with the dawn of Greek geometry, he brings us down through the dark ages, and ends with a popular sketch of the work of Bolzai, Lobatchewsky, and Riemann. Portraits of the two last are given, as well as a (poor) print of Dürer's "Melencolia," and a reduced facsimile of the plates contained in the English edition of Tacquet's Euclid. It is worth noticing that Mr. Frankland gives Euclid's own definitions of the straight line and the plane, and the proper arrangement of his postulates and axioms.

Advanced Perspective. By L. R. Crosskey and J. Thaw. vi. + 90 pp. (Blackie.) 4s. 6d.—This is a sequel to Mr. Crosskey's "Elementary Perspective," and is marked by the same qualities of clearness and simplicity. In this volume free use is made of vanishing and measuring points in oblique as well as in vertical planes: the examples are sufficiently varied, and include several interesting problems on shadows. The student who carefully works through the book ought to be able to attack any practical problem in the subject. It may be remarked that no illustration is given of the use of reduced elements when actual vanishing lines, &c., are inaccessible; and it would have been well to give a demonstration of the property of measuring points. We cannot agree with Mr. Crosskey that this work "practically exhausts the subject" except with a very limited meaning of "practically." For instance, there are many applications of projective geometry to perspective which are not touched upon here; in this respect a comparison with such a book as Fiedler's "Darstellende Geometrie" is very instructive, and shows the weak points of English text-books on the theoretical side. The result of this partial treat-

ment of the subject is to deprive the student of many resources which he would otherwise have at his disposal.

Original Investigation: or how to attack an exercise in Geometry. By E. S. Loomis, Ph.D. vi. + 64 pp. (Ginn).—There is nothing very novel in this tract, but it may be found useful as a supplement to the remarks on geometrical analysis which are found in most of the text-books. The number of illustrative examples is not large, but they are sufficient to illustrate most of the general principles available for solving problems.

Miscellaneous.

Analysis of Commercial Correspondence. By Dettloff Mueller, LL.B., M.L., Lecturer at the Handelshochschule, Leipzig, Master of English at the Offentz Handelslehranstalt, Leipzig. (Leipzig: published by B. G. Teubner.) M. 3.—This little work is an attempt to treat commercial correspondence on somewhat scientific lines. The student is taken through the range of commerce, and typical transactions, considered in their economic and legal aspects, are shown to give rise to typical letters and commercial documents. The author has, we think, attempted too much within the short space of 142 pages, unless indeed he intends the explanatory portion to serve merely as notes to a full treatment by the teacher. The plan of the book, however, is excellent. The only pity is that the serious faults of style in which the book abounds makes it of very questionable utility in the class-room of either a German or an English school. The language generally seems to be a blend of "American" and German idiom. A few specimens will suffice:—"In all cases the reply to an inquiry must be distinctly severed, by a thoughtful, pushing business man, in the body of the letter from the suggestive offers of articles not inquired." "Our bottom prices." "We are since the beginning of our business in connection with these firms." "The latter therefore may . . . go conform with the statement." "Exporters, desirous of cheaper freight, wish several parcels coming from different parts of the globe to be changed into one parcel, because the two or more, composing the new compound parcel, are in weight within the limit of certain freight rates." "My dear father died two years ago, and I would like to be able to earn my living myself as soon as possible in order to relieve my poor mother . . . I would judge myself happy to receive a favourable reply . . . With due respects, I remain, dear Sir, very truly yours."

Thoughts on Education. Speeches and Sermons. By Mandell Creighton, D.D., &c. Edited by Louise Creighton. xiv. + 215 pp. (Longmans.) 5s. net.—These addresses of the late Bishop of London are full of good things well and wisely said. The volume does not lend itself to continuous reading because of the diversity of the subjects dealt with and of an unavoidable repetition which such a course accentuates. Throughout, education is treated in that broad-minded manner for which the late Dr. Creighton was famous; for him education was a matter of practice and principles, not of systems. He never tired of urging people to disregard the provision of educational mechanism and to concern themselves with the contents of education. One of the chief results of education should be to increase a person's happiness, which, as has been said, "consists in the consciousness of the free use of our capacities in an excellent way," and these speeches and sermons go a long way towards showing how education may perform this function. The reader cannot but be impressed by the multitude of happy remarks in which the addresses abound; we refrain from quoting instances so as not to diminish his pleasure

in finding them in their proper context. All teachers would benefit by the perusal of this volume.

The Eyesight of School Children. By Edward Magennis, M.D. 32 pp. (Bristol: Wright.) 6d.—Of all the natural endowments of a child the eyesight is most important. It is consequently an imperative duty of the parent and teacher to do everything possible to preserve this "fairest gift of nature." Yet there are persons in these responsible positions who are ignorant of the functions and anatomy of the eye, and to such Dr. Magennis particularly addresses himself. We have here, told in simple language and briefly, the important facts which should be known by those who wish to preserve this faculty, and we hope all teachers and parents who feel their incompetence in this matter will study this excellent booklet.

The Youth's Pocket Note-book. Compiled by G. N. Hester, B.A. 160 pp. (Houlston.) Leather, 2s. net; cloth, 1s. 6d.—A nicely produced pocket-book in the form of a diary with four days to the page. At the top of each page an appropriate aphorism is printed. The first part of the book contains Lord Chesterfield's "Advice to his Son," and Hazlitt's "Advice to a Schoolboy." Altogether a very suitable present for a boy.

Training Colleges (Écoles Normales) for Women Teachers in France. By Maude E. Newbigin, M.A. (Edin.). iv. + 67 pp. (Edinburgh: Brown.)—Miss Newbigin, a former student of St. George's Training College, Edinburgh, and at present Lecturer in the Edge Hill Training College, Liverpool, held during the year 1900-1 a travelling studentship in connection with the Gilchrist Educational Trust, and chose as a subject for study the system of organisation and the methods of the French *Écoles Normales*. This book contains her report, which was rightly considered worthy of being printed by the Committee of Management. Miss Newbigin has provided students of pedagogy with a very readable and instructive account of the methods of training adopted in France for mistresses destined to teach in primary and secondary schools. We can cordially recommend the volume to the attention of students.

Educational Studies and Addresses. By T. G. Rooper. 213 pp. (Blackie.) 2s. 6d. net.—"Sound principles that are old may easily be laid on the shelf and forgotten, unless in each successive generation a few industrious people can be found who will take the trouble to draw them forth from the storehouse." This is the modest way in which the author of these essays speaks of his own work. But Mr. Rooper has done a great deal more than merely restate the truths propounded by educationists of other times. Scattered up and down these pages the careful reader will find many shrewd and original remarks, which are clearly the new outcome of a wide experience. A nice appreciation of the new needs of the present day, supplemented by a thorough acquaintance with all aspects of educational theory and practice, has enabled Mr. Rooper to modernise the teachings of the old masters and to provide acting teachers with practical rules suitable for immediate application in the education of twentieth-century children. The papers will be found interesting, helpful, and inspiring.

Pastors and Teachers. By the Right Rev. E. A. Knox, D.D., Bishop of Coventry. With an Introduction by the Right Rev. Charles Gore, D.D., Bishop of Worcester. xix. + 300 pp. (Longmans.) 5s. net.—We have here six lectures on Pastoral Theology delivered in the Divinity School at Cambridge earlier in the present year by the Bishop of Coventry. We gather from the author's preface that the publication of the volume has been hastened so that it may be of assistance to those interested in the education of children during the discussions on the Education

Bill now before Parliament. But the book will have a far wider circle of influence, since it deals with the duty of the clergy and of schoolmasters toward the most important part of education, namely, the formation of character. Teachers of every religious complexion will find here fruitful suggestions, and they will do well to study the lectures.

Scripture Lotto. Series II. For Young People. (To be obtained of Miss E. T. Cook, 5, Rothsay Road, Bedford.) 1s. 3d. *The Book of Books.* A new card game of Scripture History. (To be obtained of Miss A. E. Martin, Keswick.) 1s.—These are two new games, devised with no little ingenuity, for the purpose of teaching Scripture history in a more attractive way than is common. So long as the good old method of caning children who did not take the trouble to learn is abandoned in favour of modern and unwholesome plans of throwing all the onus of a child's progress upon the teacher, these devices may prove serviceable.

Macmillan's Student's Journal of School Practice and Visits of Observation.—This is a good little *vade-mecum* for students and the directors of their work in the practising schools, prepared evidently by an experienced hand. Anyone who had not had pretty intimate acquaintance with the difficulty of making minute sub-heads of observation and the like would have devised a more complicated show of points to be taken into account. The two pages of advice are as profitable and as much to the point as they are brief. There is no excessive and confusing systematisation; and not a single hard word.

The Ruin of Education in Ireland. By F. Hugh O'Donnell. 202 pp. (Nutt.) 5s. net.—The opinions of educated Catholic laymen on the Irish University question have often been asked for. One is here given of an extreme kind. Mr. F. H. O'Donnell, a former student of Galway College and a member of the Irish Parliamentary party under Parnell, has published in this book the evidence he intended to give before the present University Education Commission. He proposes that the priest should be restricted to his spiritual duties, and that the layman should have in Ireland the same freedom that he has in other Catholic countries. He compares the present system under the English Protestant Government to the Fanariote system in Turkey whereby the Sultan entrusted Greek interests to the Greek Prelacy to the effacement of the Greek laity. No Catholic government would tolerate such a system. In the author's opinion the bishops have had their chance and abused it. Maynooth was, he urges, founded for clergy and laity. The laity have been excluded. Newman founded a university, towards which £250,000 were contributed. What did the bishops do with the money? When they transferred it to the Jesuits there was "nothing but bare walls, without libraries, laboratories, or lecture halls." The Church has, the book tells us, in the last fifty years received £20,000,000 and squandered it on ecclesiastical extravagance. The bishops propose a mixed university, but have hitherto denounced mixed institutions. They have controlled primary and secondary education—and ruined it. Their new Catholic university would be in the hands of Jesuits whose system is shown by history to be ruinous to the Catholic religion. Such is a brief *résumé* of Mr. O'Donnell's arguments for distrusting the bishops in the matter of university education in Ireland.

Christ the Way. By Francis Paget, D.D. 54 pp. (Longmans.) 1s. 6d. net.—The four addresses in this little volume were given last January by the Bishop of Oxford at a meeting of schoolmasters, college tutors, and lecturers, at Haileybury. They should prove of great assistance to schoolmasters in the preparation of school sermons, and may be read with much profit by all concerned in educational work.

Reading Made Easy. Part I. By Anna Snell. vi. + 21 pp. Illustrated. (Philip.) 8d.—Miss Snell has added to this new edition of her book a short explanation of the principles to be borne in mind by teachers using it. By following the normal-word-method upon which the book is based, language, writing and reading are connected, and the child is exercised in all three at the same time. Words and ideas are conveyed to the young pupils instead of letters and sounds, and interest is thus excited from the beginning. The method is a good one, but it needs a teacher who has taken the trouble to understand it. The illustration on p. 18 would not be recognised as a van by children; it looks more like a bathing-machine.

An Old Westminster Endowment. Being a History of the Greycoat School as recorded in the Minute Books. By E. S. Day, Headmistress. 292 pp. (Rees, 124, Pall Mall.) 3s. net.—The present writer confesses that he hears now for the first time of the Greycoat School; but to judge from the extracts given out of the Minute Books, a history of the school might be expanded to several times the size of this modest book and yet be interesting. The Greycoat School was founded in 1698 as a charity school for forty children, the master to receive a salary of £26 (six pounds more than the master of Rugby School by the founder's will). The adventures of the charity, what by lack of money, what by enemies, and what by objectionable masters, are briefly and amusingly set forth. One master, Aymes, neglected the school so that nobody learnt anything, and openly insulted the Governors: they were all "a parcel of pitiful fellows," he told them; "they mismanaged their trust, and kept a prison, not a hospital;" then, turning to the boys in hall, who had been enjoying the scene, he said, "Ye poor white negroes—aye, poor slaves and prisoners—work them in slavery, whip 'em, whip 'em, make them work till they die." He then retired to the school door, and said: "You are Governors, you are, such as you are. I am master of the house and will go when I please, do what I please, and have what I please." Aymes went when the Governors pleased. Others quartered large families on the place. Everybody connected with the place seems to have had an odd name. There was Mr. Mudd the tailor, Mr. Thickbroom the coal merchant, Mr. High Street, and Mr. Groundsell; Mr. Cardinal and Mrs. Wiseman, Mr. Punch and Mr. John Leech, Mr. Drawite, Mrs. Grace Steptoe, Mrs. Langcake, Mr. David Gegondee, and many other freaks. The boys are oddly characterised also; in the Minute Books we have "Thos. Jones (fat boy)"—who is always in hot water—and "Thos. Jones (finger)." The charity made a good deal of money by selling the little girls' hair. Diogenes would have been gratified to hear of an honest baker, Mr. Browne, who "was pleased to send a sack of pease in consideration of the badness of the bread which he sent into this hospital." The boys were employed as drawers of lottery tickets, for which the trust once received a fee of £19 10s. We should like to hear more of the boy Parents, who objected to the trade he was apprenticed to as being "inconsistent to his Jenius and beneath his Tallents." There is a charming picture of a little Greycoat girl opposite page 94.

The Limits of Evolution, and other Essays. By G. H. Howison, LL.D., Mills Professor of Philosophy in the University of California. 396 pp. (Macmillan.) 7s. 6d. net.—The other essays are: Modern Science and Pantheism; Later German Philosophy; the Art Principle as Represented in Poetry; the Right Relation of Reason to Religion; Human Immortality, its positive Argument and the Harmony of Determinism and Freedom. The book is a token of the spirit of the times, a reaction against the biological bias which has led in the last generation to an attempt at a philosophy devoid of the coping-stone of metaphysics. It is not to be expected that Dr.

Howison has supplied a final system of metaphysics. He may, however, justly be said to have offered a strenuous attempt at a constructive theory of metaphysics, founded on Berkeley, Kant and Leibnitz, with divergences from them which he has carefully pointed out in his preface. Dr. Howison has undertaken a mighty task. He tells us that the chapters in this volume have been written at dates covering twenty years of his life, that he now makes considerable changes in his earlier thoughts—to bring the essays into harmony “with the governing view.” Such work is worthy of thoughtful consideration, and, it is needless to say, it is often very suggestive and stimulating in the problems raised quite apart from the recognition or non-recognition of the adequacy of the author’s theory as an explanation.

CORRESPONDENCE.

The Editors do not hold themselves responsible for the opinions expressed in letters which appear in these columns. As a rule, a letter criticising any article or review printed in THE SCHOOL WORLD will be submitted to the contributor before publication, so that the criticism and reply may appear together.

A Colonial View of the “Rhodes” Scholarships.

THE late Mr. Cecil Rhodes has left provision for certain scholarships, and has willed that these shall be awarded to certain persons possessing certain qualifications. However much we may or may not approve of these qualifications, the will of the man must be observed, and discussion of this aspect of the subject is idle. No young man is entitled to one of these scholarships unless he possesses the qualifications indicated in the benefactor’s will, and should a youth by any chance ever reach Oxford who falls seriously short of these qualifications in his life in the University, that one must expect the finger of scorn pointed at him by his fellows.

The discrimination of the relative measure of the prescribed qualifications in the several candidates that may present themselves for the scholarships is another matter altogether, and the methods of procedure may be considered fair subjects for reflection and discussion.

The qualifications appear to be :

- (1) The candidate must proceed from a certain locality.
- (2) Must have attended, for a number of years, some public or other large school (*implied*; see (5), (6), (7) *immediately hereafter*).
- (3) Must presumably show that he is able to pass Responsions, or actually hold some diploma which is accepted by the University authorities in lieu of Responsions.
- (4) Must pass a qualifying examination in knowledge and mental ability (here is a chance of acquiring some training in science!).
- (5) Must show love for outdoor sports, such love to have shown itself in a practical form to such a degree as to have won the estimation of his schoolfellows.
- (6) Must produce evidence, likewise from his schoolfellows, that he has shown the virtues characteristic of a Christian gentleman, viz. :—chivalry in the broadest and best sense, truthfulness, honour, kindness to the weak and helpless, &c.
- (7) Must be able to obtain evidence from his headmaster that he has proved himself a lad of *strong character*, that he is really an individual, that he has been loyal to his school and that he has actually shown in his school life natural ability to lead.

Personally, I regard these as excellent qualifications. It seems to me that this great man has hit quite the right ideas,

and it is to be hoped that his trustees will take every possible care to have his will in these matters followed as closely as possible.

Under the will the *boy leader* of a school can claim that this qualification of his (estimated at two-tenths by the benefactor himself) be estimated at its full value in distinguishing him from his rivals, even though he fall short of them in book-lore. Similarly the boy who throughout his schooldays has been an enthusiast in the play-fields has his claim, as also have the boys who have shown those precious gifts of charity and of chivalry, or who have been conspicuous for their loyalty to, and uprightness of character in, their school.

It is when one comes to *measure* these qualifications, to weigh them in the balance, so to speak, that one is cornered. The trustees have here a great task, and I feel that they should secure all the advice they can possibly get from the Colonies, as well as from authorities in England, before propounding a scheme for carrying out the will of the great Englishman.

It seems to me that the candidate should either be a native of a colony or have had his home in one for a considerable number of years; that the home of his parents should, at the time of the examination, be in the colony the scholarship for which he is seeking; that he should have attended a public school of the colony for a given number of years, subsequent to which he might possibly be permitted to attend a school outside the colony; that the examination should be held within the colony.

As to the qualifications pertaining to the “CHASE” (sports generally), to “CHIVALRY” and to “CHARACTER”—the three C’s: these virtues can at least be made real qualifications, although it may be difficult—perhaps impossible—to measure their degree in the several candidates for the purpose of competition. It can certainly be required of all candidates to produce satisfactory evidence from their several schools, from masters and boys, of their disposition and conduct under these three heads. A perhaps clumsy means suggests itself to me of even assigning marks. Each colony could have a committee—called, say, the Rhodes Scholarship Trust Committee—to adjudicate between the several candidates by actual evidence and careful enquiry in reference to their careers in the schools. In Newfoundland the Council of Higher Education might possibly make a satisfactory committee for this purpose, but, in all circumstances, one sees the possibilities of miscarriage in justice, the contingencies varying in the several colonies. Of course, it is a very wide subject. I am quite convinced, however, that there would be little difficulty in acquiring excellence in what I have termed the three “C’s” as an indispensable condition of eligibility. Nevertheless, I cannot forget that the benefactor really did intend that these virtues should have a *telling* effect in separating the candidates.

It must not be forgotten that Mr. Rhodes must have intended his scholarships to influence the leading schools of the Empire. The scholarships may do more than anything else towards cultivating the virtues embraced in what I have termed the three C’s among schoolboys, and therefore I feel strongly that it should be incumbent upon candidates to have attended some public school of the colony for some considerable number of years in order that the colony may not be robbed of this indirect blessing and help.

In order to debar or discourage attendance at “cramming” institutions immediately preceding the literary examination, all candidates should be required to prove that they have been at some public school for a number of consecutive years immediately preceding the examination.

It is evident that Mr. Rhodes intended attendance at school to be a *sine qua non*. Whether this attendance should be exclusively at a school in the colony or not is a question for consideration, and much might be said on both sides. I am naturally con-

cerned in the indirect effect of the scholarships on the colonial schools, and there is some danger of this effect being minimised if the best boys are encouraged, or even permitted, to leave the colony to attend schools elsewhere. On the other hand, there are some strong reasons why a lad, after attending one of the public schools of the colony until he is, say 17 years of age, should be permitted, if not encouraged to go to a school elsewhere amid a larger and more quickening environment; and as his destiny is to be Oxford, it seems reasonable to conclude that he could not do better than attend, if possible, a public school in England, where he would have a chance of acquiring such peculiarities of manner and speech as are common to English folk. The "scholar" would, in the circumstances, when he went to Oxford, feel more at home amongst his English and other *compères*, would settle down to work and enter into the corporate life of the University with more courage, and he would be able to commence immediately to derive the full benefit of life at Oxford.

It would seem a pity to send a lad to Oxford at too young an age, and I would suggest the age of 19 as being the minimum, and 21 as the maximum age for competition.

No candidate should be permitted more than two trials.

The above are just a few thoughts briefly expressed. Under each head, of course, much could be written.

W. W. BLACKALL.

Bishop Feild College,
St. John's, Newfoundland.

Proper View of Punishment.

"PUNISHMENT and apology are seldom associated together."

"I would regard the apology as a confession and as a sort of guarantee that the offence would not be repeated."

"They would be suspended, and as they would scorn to apologise they would practically be excluded."

"Whether he was right or wrong in the protests he made, he had no right to resist authority, and that being the case, there was no humiliation involved in an apology."

These quotations are not from the report of a schoolmasters' meeting, nor did the speakers probably give a thought to schools or their discipline. But they reminded me of some old speculations of my own, for which I was much laughed at by my friends, which I have never yet solved to my own satisfaction. In the early days of the Christian Church, as we may see in the letters "to the Corinthians" and elsewhere, if a member offended he was excommunicated, and only when he repented was he admitted back into the Church and to the *privilege* of punishment. "He chastiseth every son whom he receiveth." "If ye receive not chastisement, then are ye not sons." So, in the ideal school, a wilful defiance of authority should be not "punished," but treated with "suspension," or a magisterial "sending to Coventry." When the pupil is repentant and willing to submit to authority, then, and not till then, should punishment be inflicted. It should be regarded as a privilege, accorded only to one who has gained a sense of his fault, and is heartily sorry for the same. Apology should be tendered, and punishment received as a "sorrow working for righteousness." I should be glad to hear other views.

Cambridge.

T. JONES.

The Teaching of Drawing.

OF late years a great change has taken place in the teaching of drawing. This is chiefly due to the efforts of the Royal Drawing Society of Great Britain and Ireland. Its founder and director, Mr. T. R. Ablett, has for many years been en-

deavouring to prove the educational advantage of teaching this subject rationally. Briefly stated, his chief principles are the following:—

(1) Children must be taught drawing collectively in a class, and must not be allowed to work individually from copies.

(2) Before beginning to draw an object they must be trained and guided by the teacher to ensure that they *see correctly*. They must be made fully to understand the various directions in which the different lines which make up the object tend to converge. This can most readily be done by comparison and reference to other objects whose lines run in a similar direction. The great aim of the teacher must be that each line is fully understood by the pupils. For this reason the objects given to the children to draw, at any rate at first, should be very simple in outline.

(3) In drawing the objects very little attention should be paid to mere manipulation, *i.e.*, neatness of outlining. What is of importance is that the children should grasp the general form of the object they are going to draw, and understand the principles which govern the direction of its lines. Manipulation will follow gradually with practice, and in any case it is not an essential in rational drawing.

(4) As soon as the children have drawn an object, and thoroughly mastered its principles, they should be made to re-draw it from memory. This is most important, and should never be omitted. Rightly used, it will be of immense value to the child. Gradually, as he learns to understand more and more of the principles which underlie the drawing of all objects, he will be enabled to draw almost any design from memory, even those of the most complicated character.

The advantages of this rational method over the old copy system are almost too patent to require enumerating. In the first place, the child is taught *to see*; a great end, and one which every teacher knows it is very difficult to accomplish. But more than this, the child is taught *to think and to remember*. Nor is this all; for lastly, he is encouraged to put into active use what he has learnt and thought about. These are lasting benefits which will train the child to the utmost limits of his capacity.

C. GASQUOINE HARTLEY.

Hickling, Norwich.

The School World.

A Monthly Magazine of Educational Work and Progress.

EDITORIAL AND PUBLISHING OFFICES,
ST. MARTIN'S STREET, LONDON, W.C.

Contributions and General Correspondence should be sent to the Editors.

Business Letters and Advertisements should be addressed to the Publishers.

THE SCHOOL WORLD is published a few days before the beginning of each month. The price of a single copy is sixpence. Annual subscription, including postage, eight shillings.

The Editors will be glad to consider suitable articles, which, if not accepted, will be returned when the postage is prepaid.

All contributions must be accompanied by the name and address of the author, though not necessarily for publication.

The School World

A Monthly Magazine of Educational Work and Progress.

No. 44.

AUGUST, 1902.

SIXPENCE.

FORMAL LOGIC AS A SCHOOL SUBJECT.

By J. WELTON, M.A.

Professor of Education in the Yorkshire College, Leeds.

ALL educational theories of the present day seek a psychological foundation: "the child" has become the centre of interest. And this is good so long as it is not forgotten that the child has to develop into an adult, and, consequently, that a consideration of the "natural" tendencies and "spontaneous" interests of childhood is no sufficient guide to sound educational procedure. Were it true that these tendencies and interests lead a child to such mental activity as will develop his capacities and powers to their fullest extent, and that in the most fruitful directions, then, indeed, child psychology would be the one satisfactory basis of educational doctrine. But experience is far from bearing out any such optimistic opinion. Each human mind has its inherent weaknesses as well as its innate capacities, and spontaneous interest will at best lead only to the development of the latter, not to the strengthening of the former. Not spontaneous but compelled mental activity is necessary to exercise those mental functions which are naturally weak, and in arranging a course of study this medicinal effect of studies should be borne in mind as well as their more directly obvious value. "There is no stound or impediment in the wit but may be wrought out by fit studies," says Bacon, and his words convey an important truth too apt to be forgotten in these days of premature specialisation.

Not the least common "stound or impediment in the wit" is inability both to think clearly and to express thought exactly and unambiguously. Yet no one is likely to deny the importance in life of accurate thought and expression. To estimate correctly the force of evidence, to distinguish between proof and assertion, to see through sophisms, to draw exact distinctions, to avoid confusing prejudice with knowledge, the desired with the established—all this keeps a man both from deceiving himself and from deceiving others. But this—like other desirable things—only comes by being sought, and the vast majority of children show no "spontaneous" tendency to seek it. The school must supply the appropriate medicine for

loose thought and inept expression, and must insist on the medicine being taken.

On the face of it, formal logic is just such a systematic analysis of the meaning of sentences and of their combination into discourse as seems the most obvious medicine of the kind required. Moreover, it is certain that invalid argument and faulty expression are much more common in writers and speakers of to-day than in mediæval writers, who all studied formal logic in school and university. We have, then, a *post hoc*; is it also a *propter hoc*? De Morgan held that it is. "We live in an age," he wrote, "in which formal logic has long been nearly banished from education . . . The growth of inaccurate expression which this has produced gives us swarms of legislators, preachers and teachers of all kinds, who can only deal with their own meaning as bad spellers deal with a hard word, put together letters which give a certain resemblance, more or less as the case may be. Hence what have been aptly called 'the slipshod judgments and crippled arguments which everyday talkers are content to use.' Offences against the laws of syllogism (which are all laws of common sense) are as common as any species of fallacy; not that they are always offences in the speaker's or writer's mind, but that they frequently originate in his attempt to speak his mind. And the excuse is that he meant differently from what he said: which is received because no one can throw the first stone at it, but which in the middle ages would have been regarded as a plea of guilty."

Of course it will be urged that sufficient training in exact reasoning and accurate expression is given by other subjects in the ordinary school curriculum, notably by mathematics and the physical sciences. But further thought will, perhaps, throw some doubt on this.

Mathematics does, indeed, demand exact reasoning, and it gives a more thorough training in concentration of thought than does any other branch of study. But its range is limited and its expression highly technical and symbolic. There is not much belief nowadays in a training of abstract "faculties" which can, when trained, be applied to any subject whatever; such pseudo-psychology seems to linger only amongst the extreme advocates of "training the observation." Generally it will be granted that we apply our trained powers easily and well only in directions

cognate to those in which they have been trained. Thus, the trained mathematician will reason well mathematically, but will not be helped by his mathematical training to draw inferences from data which have no mathematical aspect, or in which the mathematical aspect is unimportant. Again, some minds are defective in mathematical power, and no amount of mathematical "medicine" will do much to strengthen their weakness in this direction. Nor is it necessary that everybody should become a competent mathematician. But it is desirable that every adult should be a competent thinker, and able to express his meaning exactly. We must, therefore, seek a medicine which is not mathematical to apply to the very large number of pupils who have either little ability or little time to give to mathematical studies. In this connection, too, we may note, in passing, the movement towards making geometrical mathematics more "practical" by substituting sense "intuition" for demonstrative reasoning.

The objection to mathematics as a general training in inference on the ground of the narrowness of its scope applies with perhaps greater force to any branch of physical science. This seems, indeed, to be often ignored, and teachers are urged to introduce physics and chemistry into their schools on the ground that those subjects are of pre-eminent worth in training the mind to exact reasoning. But to reason well in any subject implies an extensive knowledge of data, as well as skill in using data; consequently, instruction in chemistry will not enable one to reason well in a different subject, of the contents of which he is ignorant. Further, it is open to considerable question whether the teaching of a branch of physical science in school is such an excellent training in inference as is commonly assumed. That to reach by inference correct conclusions in physics or in chemistry demands very exact thought as well as very copious knowledge of data may be granted at once. But this is just what, in the great majority of cases, the schoolboy or schoolgirl cannot do, because the immaturity of knowledge available renders it impossible to see what data are really involved. Every natural phenomenon is of enormous complexity, and it requires very much more knowledge than a pupil at school possesses to unravel that complexity with skill and certainty. The "inferences" of such unprepared minds are, in not a few cases, more or less wild guesses from data carefully selected and presented by the teacher. Even when the conclusion enounced is true, its accuracy can be proved only by an appeal to a much wider range of data; it is, therefore, unjustified as an inference from the data present. In such cases the "science" lesson is a training in inaccurate thought, though its real character is disguised by the accidental accuracy of the conclusion.

There is needed, then, a subject which will give as general training as possible in the drawing of inferences, and it should be of such a kind that the data can be clearly and adequately grasped by the

pupils. Language studies partly fulfil the requirements. The education of rules of grammar is a process similar to the discovery of a physical law, with the difference that the data in the former case are both more familiar and indefinitely more simple than in the latter. Similarly, translation from one language to another demands clear grasp of the thought to be expressed and careful search for the most appropriate form of expression. But the full value of translation is only gained by fairly advanced students; and, moreover, translation merely develops the power of grasping thought; it gives no practice in criticising thought.

Such considerations as these may throw doubt on the claim that the usual school curriculum gives an adequate training in exactness of thought and expression. What is needed is an instrument to develop the power of dealing with data of all kinds, and of testing the validity of the inferences both of oneself and of others. Such an instrument, we believe, is to be found in formal logic, the very province of which is the investigation of the connection of data with conclusions, independently of the nature of the data themselves and of the actual truth of the conclusion. It is a subject, indeed, in much disrepute amongst those who have not studied it. Those who have will be more likely to agree with De Morgan that "logic tends to maintain the power of reason over the unusual and unfamiliar more nearly equal to the power over the usual and familiar than it would otherwise be." No logician would claim that logic alone will make a man reason well, but a study of the forms of valid inference and the more usual modes of violating those forms at least affords some protection against many kinds of error, and continued practice in both analysing given expressions of thought and seeking clear forms of expression for oneself trains a habit of accurate use of language which reacts on the character of thought.

It will probably be objected that formal logic is too abstract and technical to awaken the interest of children. In reply it may be urged that most of the technicalities of the subject are excrescences which may well be dispensed with. We would not encumber school logic with the artificial forms of immediate inference or with the distinctions of moods. Stripped of these redundant refinements, formal logic is much less technical than any branch of physical science. Nor is it exceptionally abstract. The subject matter is thought expressed in language, and this is as concrete as is the subject matter of chemistry, or physics, or even geography. The relations logic investigates are abstract only in the sense in which all general relations are abstract. There is nothing in the essential nature of the subject, then, to make it repellent to young minds. Indeed, Lewis Carroll, in his preface to the First Part of his "Symbolic Logic"—a book intended primarily for young folk—speaks of it as "this fascinating subject" and as a "most interesting mental recreation." Of course it may be made dull by bad teaching; but then so may every subject.

Nor are we pleading for the addition of a new subject to a time table already in too many cases overcrowded. Everything we desire to see taught can be taught as integral parts of subjects already accepted, and we will be bold to say will make the teaching of those subjects more effective because more real. The matter of formal logic may be classified under three heads—terms, propositions, inferences. Of these the first may be dealt with as part of grammar, and will include investigations into such questions as implication and application of terms, the force of negative prefixes and suffixes, the differences between collective and class terms. In such enquiries there will be made manifest the nature of definition, the difficulties of framing exact definitions and the mistake of supposing that inability to define is necessarily a proof of complete ignorance. The doctrine of propositions treats of the forms in which judgments are expressed, especially the distinctions between general and particular, and between categorical and hypothetical. These distinctions will be drawn out in connection with grammar lessons and applied in composition lessons. Finally, the doctrine of inferences treats of the justification of judgments and of the setting forth of proof. It will, therefore, find its place mainly in composition lessons, grammar being called in as an auxiliary in dealing with matters of form.

It is not intended that these three lines of enquiry should be conducted in this order. Probably the best starting-point is the examination of some fallacious arguments with the object of discovering the nature of the invalidity. This may be made not only interesting but fascinating, and it will lead both to the formulation of canons of correct inference and to the more minute examination of the forms of propositions and the meanings of terms. This is a mental exercise appropriate to children of from twelve to fourteen years of age, and we believe that one or two lessons a week conducted on these lines would be of immense benefit to the pupils, and would be a most valuable preliminary to the study of the physical sciences as well as an excellent preparation for life.

We would urge, finally, that the examination of inferences be not confined to syllogism, but be extended on the lines of symbolic logic to combinations of more than two premises. Logic is thus made much more interesting as well as much more extensive in its application. The use of diagrams should be encouraged, and the examples should be made as varied and attractive as possible. Probably the teacher cannot do better than take as his general guide the little work by Lewis Carroll to which reference has already been made. These remarks may, indeed, appropriately close with the concluding sentences of the advice given to his young readers by that most sympathetic of their friends:—"Once master the machinery of Symbolic Logic and you have a mental occupation always at hand, of absorbing interest, and one that will be of real use to you in any subject you may take up. It will give you clearness of thought—the ability to see your way through a puzzle—the

habit of arranging your ideas in an orderly and get-at-able form—and, more valuable than all, the power to detect *fallacies*, and to tear to pieces the flimsy, illogical arguments which you will so continually encounter in books, in newspapers, in speeches, and even in sermons, and which so easily delude those who have never taken the trouble to master this fascinating Art. *Try it.* That is all I ask of you!"

PHYSICAL TRAINING IN SCHOOLS.

By THOMAS CHESTERTON.

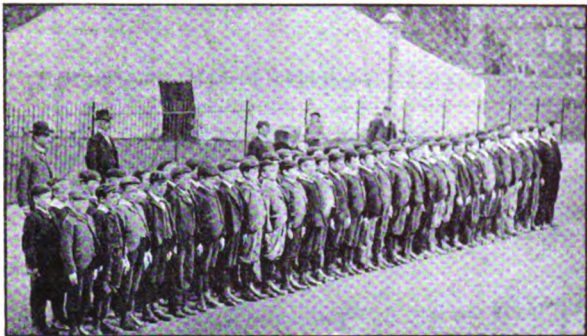
Organising Teacher of Physical Exercises for the London School Board.

I.—THE MODEL COURSE OF THE BOARD OF EDUCATION.

THE ever-increasing migration of people of almost every class of life to our large towns and cities is making the matter of systematic physical training an indispensable addition to our present artificial mode of living. The want of exercise of a rational and beneficial character is felt daily in all sections of the community. Particularly is this so in London and the large provincial towns of the United Kingdom, where the population is necessarily crowded, and few facilities exist for out-door recreation and sports. A strong reason for the introduction of a rational system of physical training for children is the fact that in recent years teachers have become alive to the necessity of adopting some form of drill or physical exercises, to maintain attention and order in their classes, and to secure change from the monotony of study. This great want was felt many years ago, as is evident from the numerous works on physical training, deportment, calisthenics, &c., published in the latter part of the eighteenth century. During the early part of the nineteenth century we find the number of works on these and kindred subjects increasing by leaps and bounds, till, towards the end of that century, there was a plethora of systems and methods (all of which had their special claims) overrunning the country. England, among the other important nations of Europe, seems to have been one of the latest in the field with regard to recognising the full importance of the subject, and in adopting what may be called a common system for the use of her school-children. Germany was the first of European countries to systematise physical training, and to draw up definite exercises on physiological and anatomical lines. Undoubtedly, one object in each country was to improve the physique of the nation; while the chief end in view was to rear boys with a military instinct, and to fit them to take their places, on arriving at manhood, in the defence of their country. Hence we find that every continental system was based on military

lines, and that the training was in nearly every instance for boys only.

The numerous systems in vogue at the present time in the United Kingdom are undoubtedly chiefly derived from continental sources, the free movements having the Swedish system as their foundation, while exercises with dumb-bells and similar appliances spring from the German system. During the past twenty years more strenuous efforts have been made than in any other former



Model Course.—Formation in two ranks.
Oxford Gardens Board School, London, W.

period to arrive at some definite system. Still we appear to be as far as ever from arriving at a definite national system of physical training for children. This matter appears to be one which can only right itself in time, since no legislation can succeed in making even two persons think alike on the matter. For instance, some authorities approve of free movements; some want dumb-bells; others want both free, dumb-bell, and wand exercises; some insist on having music to accompany all the exercises, no matter of what character; others do not want music; a few prefer clubs, sceptres, and calisthenic rings; some desire gymnastics on fixed apparatus, though others totally ignore the value of such appliances; some advocate systematic games only; while others maintain that swimming can supply the want better than anything else. Some systems err on the side of extreme simplicity mingled with the grotesque, one of these systems directing the pupils to lie on their backs, roll from side to side, kick, and whistle. On the other hand, there are some so-called systems which advocate a heterogeneous and complicated collection of positions and contortions of such a nature as totally to defy anyone to teach them without the continual use of the text-book.

Of late years we have had another method (by no means new), viz., that of elastic developers, pulley weights and patent hand-appliances. This system has been advocated more as a money-making venture than for the physical benefit which accrues from its use. Still such a method has its special value when applied to individuals, but nothing in advance of what was possible before its re-introduction.

With regard to the systems now in use in this

country, it can only be said that they are too numerous to mention, nearly every town of any importance having a system not necessarily very dissimilar from others, but sufficiently unlike to say there is a difference. Each of these systems is in most cases only observed locally, and is rapidly giving way to one or other of the systems which will be dealt with in these articles. Still, many of these local systems are admirably compiled, and appear to be producing good results.

The only systems that can be considered as widespread are the following:—The Model Course, issued by the Board of Education; the Swedish System; and Chesterton's Drill and Physical Exercises. The following short description of these systems will give the reader a fair idea of their usefulness, and set forth the claims advanced in support of each.

THE MODEL COURSE.

The Model Course, issued in pamphlet form by the Board of Education, has not been before the public long enough for one to arrive at any definite conclusion as to its merits; still, as it is composed of a little from every known system, ample scope is given to form some idea of its value as a means of national physical culture. The system has evidently been compiled primarily as an incentive to military drill, the great war-scare of the past three years being undoubtedly responsible for its introduction. The course is divided into two parts. Part I. consists mainly of military drill as taught to recruits in the British Army, and the instructions are identical with those found in the Infantry Drill Book, with the exception that the word "scholar" is substituted for the word "recruit" or "soldier." The drill contained in Part I. is much beyond that required in the physical training of children, and contains considerably



Model Course.—Knees bending and stretching.
Harper Street Board School, London, S. E.

more drill than is taught to a soldier before a rifle is placed in his hand; in fact, there is more than many recruits succeed in mastering during their first three months of service, and more than any class of elementary school-children will satisfactorily accomplish during their school career, in the time set apart for the subject.

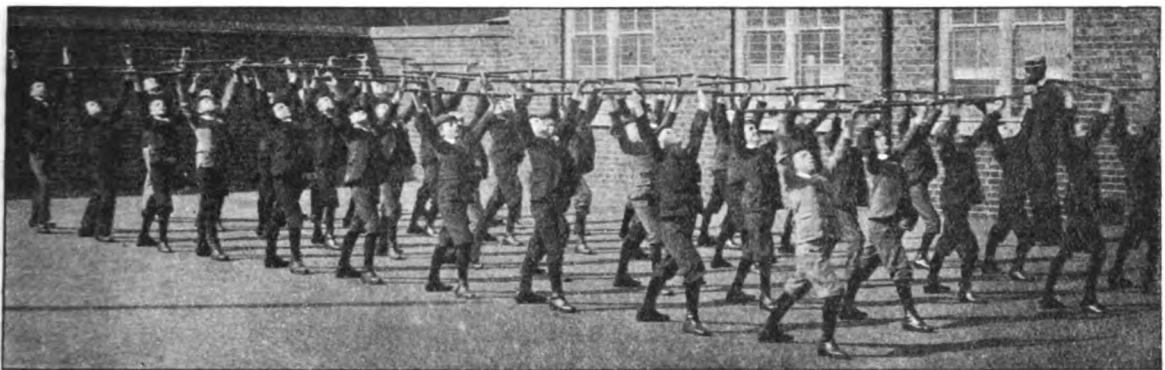
Part II. consists entirely of Physical Exercises. A few general instructions head this part, and then follows a series of leg exercises, which comprise

marching with heel raising, leaping off the left and right foot, hopping, rapid marching, gymnastic marching (slow marching with knee raising), and double march (with or without knee raising). The foregoing exercises are identical with those given to the recruit as part of his physical training. Free movements (four exercises only) come next, one of which "may be omitted at discretion." There are five exercises with staves, identical with those done by the British soldier in Physical Drill with Arms, and lastly, there are seven groups of exercises with dumb-bells, five of these being those used in the training of recruits. The exercises are intended for girls as well as for boys, the object in view being "not display but the setting-up of the scholars, and the development of their muscles and activity." While the compilers have been extremely careful to include all the elementary military drill in a strictly progressive order—although one important point, "sizing," is omitted—still they have made no attempt whatever to set

when dealing with young soldiers, and where numerous squads, in all stages of advancement, may be found on a parade ground at the same time; but it is absolutely impossible when dealing with classes of elementary school-children, where each teacher is responsible for the physical training of one particular class.

In addition to the above-mentioned Drill and Physical Exercises, we have also a deep-breathing exercise; but as so many medical authorities differ on that particular branch of the subject, it is extremely difficult to determine which method is the correct one to follow. The method suggested is different from all others advocated by experts.

The system of Drill and Physical Exercises contained in the Model Course is an excellent one if restricted to the purpose for which it was first intended—the training of the soldier; but, in its present form, it is totally unsuitable and impracticable for the physical training of elementary school-children, particularly those in the lower



Model Course.—Physical drill with staves. Eltringham Street Board School, London, S.W.

forth the Physical Exercises in a similar manner, most advanced exercises being introduced without any elements being previously described or practised. This paucity of elementary movements, together with the small number of advanced exercises given, constitutes the principal defect in the whole course. The general instructions say that in teaching "the work should be so arranged as to be always changing"; but little variety of movement is given to enable the teacher to comply with the instructions. A careful perusal of the pamphlet convinces one that the second part of it must have been compiled by someone who was not intimately acquainted with the conditions obtaining in our elementary schools, or who possessed but an incomplete knowledge of the physical training of children.

One paragraph of the instructions contained in the pamphlet will confirm the truth of the above remark. The paragraph says: "After the first few lessons, the teacher must carefully select those scholars who are fitted by their muscular strength, activity, and intelligence, for harder work, and these may be pushed on, and the weaker kept at easier exercises." Such a method is all very well

classes. The physical exercises would be practicable and beneficial so far as the elder scholars, from twelve to fourteen years of age, are concerned, provided that they had, when in the lower classes, been taught, and had practised progressively, the simpler movements from which the advanced exercises given in the Model Course have been evolved.

This course must be considerably improved, simplified in many respects, amplified in others, and all irrelevant matter removed before it can be looked upon as a "Model Course," and no more military drill should be demanded than is necessary to form a basis for the proper carrying out of the Physical Exercises.

IN connection with the International Exhibition of Modern Decorative Arts, to be held at Turin from August to October of this year, there will be an exhibition to show the present state of physical education in all its aspects. Special sections are to be devoted to toys and appliances for manual training, to games, gymnastics and other forms of recreation, and to the construction and equipment of primary schools. Conferences and displays of physical exercises have also been arranged. Intending exhibitors should communicate with Prof. L. Pagliani, 37, rue Bidone, Turin.

ENGLISH AND HISTORY IN THE NEW MATRICULATION EXAMINATION OF THE LONDON UNIVERSITY.

By F. J. C. HEARNshaw, M.A., LL.M.

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I.—THE CHANGES IN THE SYLLABUS.

TAKEN as a whole, the changes in the Matriculation syllabus effected by the new regulations do not spell reform, but revolution. The examination is to be shorter: there will be six papers instead of nine. It will admit of much more complete specialisation: neither Latin nor Science is compulsory. The standard in several subjects is lower: only one of the two Latin papers survives; the English is a mere shadow of its former self. As a result, the examination will be at once easier and less valuable. It is an open secret that the London medical schools have found the old Matriculation a well-nigh insuperable bar to many of their students who desired the London medical degrees. It is largely to their influence that the present degradation has taken place. The Matriculation has ceased to be a "leaving examination" for schools: it has become an entrance examination to the reconstituted university. It would be well for schoolmasters and schoolmistresses to recognise at once that it is no longer a worthy goal towards which to direct the ambitions of their better scholars. It will in future rank with the "Little-go" of Cambridge and the "Smalls" of Oxford; and will be regarded as a necessary evil to be endured by those who desire London University degrees, but as in itself of little value.

In no subject is the lowering of standard more evident than in the English. There is to be one paper only. From the syllabus English Grammar, the History of the Language, and Literature, have all disappeared. The single remaining paper, which may well be headed "General Elementary English," is to contain questions on (1) Composition, *précis*-writing, paraphrase, analysis of sentences; (2) the salient facts of English History; and (3) the salient facts of General Geography.

It is an undoubted advantage that the History has ceased to be limited by the old irrational "1700 A.D." It is also well that Geography has at last been recognised. On the other hand, the omission of English Grammar is wholly indefensible; while to attempt to test a knowledge of so many subjects in one three-hours' paper is simply ridiculous. English Grammar, Composition, &c., ought to have had one paper; History and Geography together a second paper.

The inclusion of History and Geography among the *optional* subjects makes it possible for candidates who have no other specialities to offer to supplement the vast and vague generalities of the compulsory paper by more precise and detailed study; but there is nothing to compensate for the elimination of Grammar. One regrets, too, the disappearance of Literature. It was not a subject

easy to examine in; but few subjects opened up to teacher and to class such wide regions of wonder and delight.

II.—THE NEW SYLLABUS.

But just as Mark Antony came to bury Cæsar, not to praise him, so it is the main work of lowly pedagogues to prepare schemes of study, not to criticise regulations. "Theirs not to reason why, Theirs but to do," &c. What to senators or to examiners are the arid hours which must be spent by teachers amid the desolations of *précis*-writing, the dissections of analysis, the desecrations of paraphrase, and the depravities of composition?

(1) The Compulsory "English" Paper:—

(a) *Composition* might well be taught, not as a subject by itself, but as an adjunct to the other subjects of the curriculum. Topics from History, Geography, Classics, Science, might be made the basis of essays, by means of which the main rules of correct writing could be inculcated. For teachers and others who desire a handbook of composition the following may be mentioned: "A Manual of Essay-writing," by J. H. Fowler (Black, 2s. 6d.), and "A First Manual of Composition," by E. H. Lewis (the Macmillan Co., 3s. 6d.).

(b) *Précis-writing* embodies the art of summarising and abstracting. It is the art, very valuable in its place, of the newspaper reporter. It has long held a prominent position in Civil Service examinations, and manuals exist for the use of candidates for these examinations. Such are T. Evan Jacob's "Indexing and Précis Writing" (Macmillan, 2s. 6d.) and A. W. Ready's "Précis Writing" (Bell, 3s. 6d.). But for purposes of Matriculation, it would probably be sufficient for teachers to select a few parliamentary speeches from *The Times*, or a few paragraphs from some narrative-book, and require the pupils to abstract the essentials and put them together in the form of a concise summary.

(c) *Paraphrasing* is a vicious practice, combining all the worst excesses of vivisection and profanation. The living words of the poets, in particular, ought to be regarded as sacred and inviolable. Poetry differs in kind from prose; the one cannot be transmuted into the other. The command over expression given by paraphrasing does not compensate for the æsthetic degradation involved. Those who are compelled to teach this obnoxious subject will require no text-book. They will choose for the operations of their pupils all the poems which they most dislike.

(d) *Analysis* is a familiar school subject. It is adequately explained in most text-books of English grammar. Among these, Nesfield's "Manual of English Grammar and Composition" (Macmillan, 2s. 6d.) is highly to be commended. Books dealing specially with the subject are C. P. Mason's "Analysis" (Bell, 2s.) and Richard Wilson's "A First Course in Analysis and Grammar" (Arnold, 1s.).

(e) *English History*. No date limits are stated; but only the salient facts are expected to be known. Probably a small text-book like Ransome's "Elementary History of England" (Rivingtons, 1s. 9d.), or Sanderson's "Summary of British History" (Blackie, 1s.), would be sufficient. But it would be eminently desirable to use some less meagre outline. The educational value of summaries is small. More adequate reviews of English history will be found in the manuals of Hassall (Rivingtons, 3s. 6d.), Oman (Arnold, 5s.), Ransome (Longmans, 4s. 6d.), and Mathews (Macmillan, 4s. 6d.). Any one of these will well cover the requirements of the syllabus.

(f) *General Geography*. Again only the salient facts are asked for. Several excellent and most interesting text-books have lately appeared. H. R. Mill's "General Geography" (Macmillan, 3s. 6d.), Chisholm's "School Geography" (Longmans, 3s. 6d.), and Lyde's "The World" (Black, 2s. 6d.), are all admirable. It is probable, however, that Longmans' "Shilling Geography" contains all that is absolutely necessary.

(2) The Optional "Modern History" Paper:—

This paper will contain questions on "the general course of English history from 1485 to the death of Queen Victoria, with some reference to the contemporary history of Europe and Colonial developments." A note adds that "the questions will be framed to test the general conceptions of history and historical development rather than technical detail." This syllabus is a distinct improvement on the old one. There is no doubt that a knowledge of the last two centuries of British history is of paramount importance. The mention of "the contemporary history of Europe," moreover, is commendable; the history of these islands has been too long studied in isolation. It would have been much better, however, if modern European history had been made an "optional subject" by itself. One might have hoped then to see it introduced into school curricula. For this paper—

(a) *English History, 1485-1901*, is treated sufficiently thoroughly in the text-books of Hassall, Oman, Ransome, and Mathews, already referred to. Students who can afford to look beyond the Matriculation examination to more advanced work, and in particular those who are thinking of taking History in Intermediate or Final Arts, would do well to read up the period in the larger books of Ransome, "An Advanced History of England" (Rivingtons, 7s. 6d.), or York Powell and Tout "History of England" (Longmans, 7s. 6d.).

(b) *History of Europe, 1485-1901*. The questions on this subject are bound to be so vague and so general that it would not "pay" to devote time to a special text-book. It will be sufficient to give particular attention to the foreign affairs treated of in the manual of English history used.

For reference, however, the following would prove valuable: Lodge's "Modern Europe" (Murray, 7s. 6d.), Miss Wilmot-Buxton's "Makers of Europe" (Methuen, 3s. 6d.), Thatcher and

Schwil's "General History of Europe, 350-1900" (Murray, 9s.).

(c) *Colonial Developments* are dealt with in all recent text-books of English history. Those, however, who wish to have them treated connectedly should get either Woodward's "Outline History of the British Empire" (Camb. Univ. Press, 1s. 6d. net), or Miss Dodd's "Short History of the English Colonies" (Dent, 2s. 6d. net). For reference, Jose's "Growth of the Empire" (Murray, 6s.) may be commended.

(3) The Optional "Ancient History" Paper:—

This paper is limited to "the general course of Greek and Roman History, and an outline of the earlier Monarchies." The questions are to be of the same nature as those in the Modern History paper.

(a) *Greek History* is covered in sufficient detail in Smith's "Smaller History of Greece" (revised edition, Murray, 3s. 6d.). Somewhat fuller are the two excellent modern text-books of Shuckburgh (Camb. Univ. Press, 4s. 6d.), and Oman—7th edition only—(Longmans, 4s. 6d.).

(b) *Roman History* is well and concisely told in Smith's "Smaller History of Rome" (revised edition, Murray, 3s. 6d.). Another book, even more brief, and yet quite full enough, is Shuckburgh's "History of Rome for Beginners" (Macmillan, 3s. 6d.). Well's "Short History of Rome" (Methuen, 3s. 6d.) will also amply cover the requirements of the syllabus.

(c) *The Earlier Monarchies, viz., Egypt, Chaldæa, Assyria, Babylonia, Media, and Persia*, are dealt with in Smith's "Smaller Ancient History" (Murray, 3s. 6d.). A slighter book, however, Sanderson's "Ancient Oriental History" (Blackie, 1s.) contains all that need be known.

In conclusion, it may be noted that the new syllabus is certain to call forth a crop of special books. For example, already Messrs. Clive and Co. announce for September a volume to cover the Composition, Précis-Writing, Paraphrase, and Analysis of the English paper, and a "Modern History, 1485-1901," dealing with all the topics required for the optional paper bearing that title.

Macmillan's New History Readers. (Senior.) v. + 314 pp. 2s.—This is the third circle in the course of Readers "on the concentric plan," the previous two of which we have already noticed. The stories are well told, the illustrations are good, and though we have marked some small points on which we should differ from the writer, most of them are not important enough to mention, or seriously to diminish the value of the book. But a few may be pointed out. John did not "sign" Magna Carta. "Italy" was not a "power" in the fifteenth century. John Huss was not (as seems to be implied on p. 144) a contemporary of Luther and Melancthon. The first words of the Habeas Corpus Act are not, nor "do they mean in English," "you may have the body." William and Mary did not promise "to obey the Parliament." The range of events is from prehistoric times to the late war in South Africa. The summary is published separately in a pamphlet of 52 pages, price 4d.

THE TEACHING OF MATHEMATICS AT PREPARATORY SCHOOLS.¹

By CHARLES GODFREY, M.A.

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III.—ALGEBRA.

IT has been the custom in England to begin the study of algebra before that of geometry, the opposite practice being usual on the continent. So long as geometry is regarded as synonymous with "Euclid," probably it is wise to learn algebra first. But if we are to make the introduction to geometry experimental, it will be advisable to spend a year at this work before attacking the more abstract and arbitrary science of algebra.

There has been a tendency in teaching algebra to take the duller and less useful parts of the subject at the beginning. In reality long multiplication and division, the rule of H.C.F., fractions with literal denominators, fractional and negative indices, need not come within a boy's view for two years; the algebraical rules for square and cube root he will never need even if he is to be Senior Wrangler. A reasonable order for the early parts of the subject would seem to be such as the following:

Transition from arithmetic to algebra; negative number and its application to quantity; use of brackets, drill in notation of algebra; addition and subtraction, treated as operations with brackets; positive integral indices; multiplication and division by expressions of one term; practice in numerical evaluation by verifying identities, and testing roots of equations.

Symbolical expression.

Simple equations and problems.

Fractions with numerical denominators.

Equations involving such fractions.

"Horizontal" multiplication, with plenty of practice in writing down the squares of given expressions.

Cartesian co-ordinates; plotting of simple graphs.

Simultaneous simple equations illustrated by graphs.

Problems on simultaneous equations.

Factors of expressions of the form $ax^2 + bx + c$, when a, b, c are integral numbers (important particular cases: $x^2 - a^2$, $x^2 \pm 2ax + a$).

How to solve an equation $f(x) = 0$ when $f(x)$ can be factorized.

How to solve by means of a graph when $f(x)$ cannot be factorized at sight.

Problems on easy quadratics.

H.C.F. and L.C.M. of expressions that can be factorized at sight.

Long multiplication and division.

Detached coefficients.

Rule for H.C.F.

Quadratic surds.

How to solve quadratics by completing the square.

How to reduce degree of equation when one or more roots can be found by inspection.

Arithmetic and geometric progressions.

Revision of fractions; ratio and proportion.

To describe a first lesson in algebra is a task from which one may well shrink; probably nothing in elementary teaching needs more judgment and mathematical knowledge. But one thing is clear—the elementary teaching of algebra must be

very largely arithmetical. To give an example: every boy will assume that $(a + b)^2 = a^2 + b^2$; but if he is told to try the effect of putting numbers instead of a and b , he will at once see his mistake. There are a few very excusable blunders that con-

stantly recur: $\frac{1}{a} + \frac{1}{b} = \frac{1}{a+b}$, $\sqrt{a+b} = \sqrt{a} + \sqrt{b}$, and so forth. These must be referred to continually in oral work, and are best exorcised by arithmetical illustrations.

The idea of NEGATIVE NUMBERS is taken in without great difficulty: one can refer to debts, or to games; a score of -3 is what a golfer will call "3 down"; if this is wiped out, it means that he must have won 3 points; therefore $-(-3) = +3$. The most interesting practice in dealing with the negative sign, as indeed with all the elementary operations, is provided by the tracing of graphs, of which more will be said below.

ADDITION AND SUBTRACTION.—From the sum of $a + 2b$ and $2a + b$, subtract the sum of $a + b$ and $a - b$.

$$\begin{aligned} & \{(a + 2b) + (2a + b)\} - \{(a + b) + (a - b)\} \\ &= \{a + 2b + 2a + b\} - \{a + b + a - b\} \\ &= \{3a + 3b\} - \{2a\} \\ &= 3a + 3b - 2a \\ &= a + 3b. \end{aligned}$$

This way of working addition and subtraction "horizontally" brings out the meaning and use of brackets; the "vertical" method of putting one expression under the other wastes an opportunity, and may lead to mechanical work.

MULTIPLICATION should be done in the same way, the pupils being trained to write down the product by inspection, term by term.

NUMERICAL EVALUATION.—To give point to this work it is well to set chiefly questions of the following type:—Discover, by substitution, whether any of the numbers 1, 2, 3, 4 are roots of the equation: $x^3 - 8x^2 + 19x - 12 = 0$. Or again—ascertain whether the following statement is true:—

$$(a + b)^2 + (a - b)^2 = 2a^2 + 2b^2.$$

(i.) If $a = 2, b = 1$

(ii.) $a = 3, b = 2$

(iii.) $a = -2, b = -1, \&c.$

Numerical evaluation should be practised incessantly throughout the algebra course by means of graphs.

EQUATIONS.—THE FOUR AXIOMS.—Ax. i.: Any the same number may be added to both sides of an equation.

Ax. ii.: Any the same number may be subtracted from both sides of an equation.

Ax. iii.: Both sides of an equation may be multiplied by any the same number.

Ax. iv.: Both sides of an equation may be divided by any the same number (excluding zero).

These four axioms are the corner-stones of equation-solving; it is not too much to say that, for at least the first year, no other method of dealing with an equation should be permitted. There is nothing more hopeless than the task of eradicating that noxious shibboleth, "Take it to the other side and change the sign": a boy once taught in this way has almost forfeited his chance of ever under-

¹ Concluded from page 245.

standing how to solve an equation. Furthermore, his answer will generally be wrong.

When the solution has been found, it must be verified. Verification is an essential part of the process of solving an equation. If this is neglected, the meaning of a root will not be understood. Incidentally, verifying a root often gives good practice with fractions.

Solve the equation :—

$$\frac{x-1}{3} - \frac{2x-3}{5} = \frac{3x-4}{2} - x$$

referring to the four axioms, and verifying the solution.

Multiply both sides by 30 :—

$$10(x-1) - 6(2x-3) = 15(3x-4) - 30x \dots \text{Ax. iii.}$$

Remove brackets :—

$$10x - 10 - 12x + 18 = 45x - 60 - 30x.$$

Simplify :—

$$-2x + 8 = 15x - 60.$$

Subtract $15x + 8$ from both sides :—

$$-17x = -68 \dots \dots \dots \text{Ax. ii.}$$

Divide both sides by -17 :—

$$x = 4 \dots \dots \dots \text{Ax. iv.}$$

Verification. If $x = 4$:—

$$\frac{x-1}{3} - \frac{2x-3}{5} = \frac{3}{3} - \frac{5}{5} = 1 - 1 = 0.$$

$$\frac{3x-4}{2} - x = \frac{8}{2} - 4 = 4 - 4 = 0.$$

∴ $x = 4$ is the correct solution.

GRAPHS have found their way into elementary work, and are now recognised as quite the most valuable instrument in our possession for awakening interest.

For a first lesson in graphs, a square-ruled blackboard is necessary; each boy must be provided with squared paper.

Draw on the board a pair of lines OX, OY, intersecting at O at right angles. These are the "axes." Explain that one can get from O to any point on the board by first journeying horizontally a certain number of squares, and then journeying vertically a certain number of squares. Thus, a pair of numbers is sufficient to describe the position of any point on the board; these are the "co-ordinates" of the point. If the horizontal journey is to the right, it is reckoned +; if to the left it is -. Similarly, if the vertical journey is up, it is +; if down, it is -.

It is advisable to practice the use of co-ordinates before proceeding further. This may be combined with practice in finding areas on squared paper, as suggested in the article on Geometry in the present series. Thus :—

Find the number of squares in the figure whose corners are :—

- (i.) (2, 2), (-2, 2) (-2, -2) (2, -2) (a square of area 16).
- (ii.) (0, 0), (0, 6) (3, 4) (a triangle of area 12).
- (iii.) (0, 0), (0, 6), (8, 4) (an equal triangle).

There must, of course, be plenty of oral work; the class being asked to name the co-ordinates of points indicated on the black-board; and in-

versely, to mark on their paper points whose co-ordinates are given by the master.

We may now proceed to draw a graph, e.g., that of $y = 2x - 3$. Let any values be assigned to x , and the corresponding values of y calculated, the work being arranged in a tabular form :—

Graph of $y = 2x - 3$:—

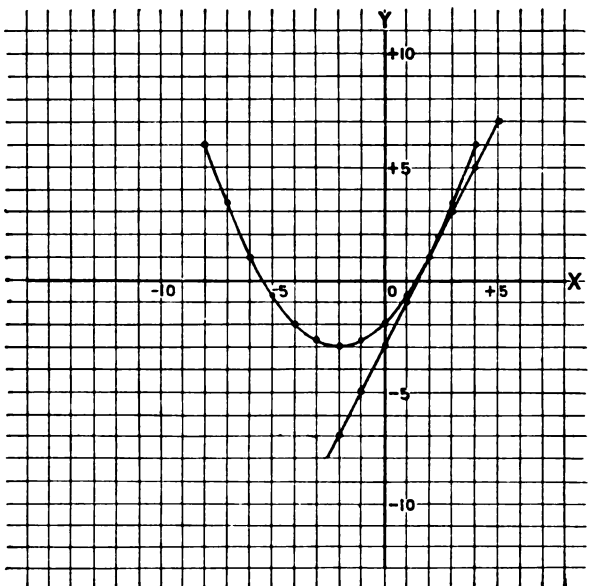
x	5	4	3	2	1	0	-1	-2	-3	-4	-5
y	7	5	3	1	-1	-3	-5	-7	-9	-11	-13

The above table consists of a set of pairs of numbers (5, 7) (4, 5), &c. To each pair of numbers corresponds a point, which must be marked on the squared paper, the x number being always measured off horizontally, the y number vertically. If all the points thus found be connected by a line drawn freehand, this will be the graph.

For more complicated equations, it is easier to make the computation in several stages, e.g. :—

Graph of $y = \frac{x^2}{4} + x - 2$:—

x	3	2	1	0	-1	-2	-3	-4	-5	-6	-7
x^2	9	4	1	0	1	4	9	16	25	36	49
$\frac{x^2}{4}$	2.25	1.00	0.25	0.00	0.25	1.00	2.25	4.00	6.25	9.00	12.25
$\frac{x^2}{4} + x$	5.25	3.00	1.25	0.00	-0.75	-1.00	-0.75	0.00	1.25	3.00	5.25
$y = \frac{x^2}{4} + x - 2$	3.25	1.00	-0.75	-2.00	-2.75	-3.00	-2.75	-2.00	-0.75	1.00	3.25



Incidentally, the accompanying figure shews that, approximately—

- (i.) The roots of $\frac{x^2}{4} + x - 2 = 0$ are $x = 1.5$ and $x = -5.5$.
- (ii.) The solution of the simultaneous equations:—
 $y = 2x - 3$
 $y = \frac{x^2}{4} + x - 2$ } is $(x = 2, y = 1)$ occurring twice.

For very elementary work, it is advisable to limit graph tracing to the forms $y = ax + b$ and $y = ax^2 + bx + c$, where a, b, c , may be any rational quantities.

SIMULTANEOUS EQUATIONS.—The application of graphs to simultaneous equations is obvious. Questions may be set conveniently in the form:—

$$\text{Solve the equations: } y = 3x - 2 \\ y = -2x - 1$$

Also draw the graphs and ascertain that they meet in the point given by the solution.

The following is an interesting type of exercise: Draw on the same axes the graphs $y = x + 3$, $y = x - 3$, $y = -x - 3$, $y = -x + 3$; and find the area enclosed by the four graphs.

FRACTIONS need not take up much time; it is unnecessary to introduce literal denominators at first; probably the solving of equations will provide enough practice in fractions with numerical denominators.

QUADRATIC EQUATIONS.—When a boy has learnt the method of solving a quadratic by “completing the square” he is apt to forget that factorising is the natural method, and the easiest whenever it is possible. For this reason it is perhaps wise to interpose some interval of time between the teaching of the two methods.

When the second method is needed, the roots should not generally be left in a surd form, but should be actually worked out to a few significant figures; and even these approximate roots should be verified occasionally, contracted multiplication being used for the purpose.

Solving quadratics by a formula ought not to be taught to boys at preparatory schools.

EQUATIONS WITH LITERAL COEFFICIENTS may very well be relegated to a revision course of algebra.

QUADRATIC SURDS.—A very small subject. The important points are to see that $(\sqrt{2})^2 = 2$, that $\sqrt{8} = 2\sqrt{2}$, and that $\sqrt{a^2 + b^2}$ is not $a + b$. The following are useful types of exercise:—

Given that $\sqrt{2} = 1.414 \dots$ evaluate to three significant figures:

(i.) $(\sqrt{8} - 1)^2$ (ii.) $\frac{1}{\sqrt{8} - \sqrt{2}}$

$$\begin{aligned} \text{(i.) } (\sqrt{8} - 1)^2 &= 8 + 1 - 2\sqrt{8} \\ &= 9 - 4\sqrt{2} \\ &= 9 - 5.66 \dots \\ &= 3.34 \dots \text{ approx.} \end{aligned}$$

$$\begin{aligned} \text{ii } \frac{1}{\sqrt{8} - \sqrt{2}} &= \frac{\sqrt{8} + \sqrt{2}}{(\sqrt{8} - \sqrt{2})(\sqrt{8} + \sqrt{2})} = \frac{2\sqrt{2} + \sqrt{2}}{8 - 2} \\ &= \frac{3\sqrt{2}}{6} \\ &= \frac{\sqrt{2}}{2} \\ &= 0.707 \text{ approx.} \end{aligned}$$

These pieces of manipulation are quite necessary in themselves, as, for instance, in the exercise:—

Verify that $3 + \sqrt{2}$ is a root of the equation $x^2 - 6x + 7 = 0$.

RATIO AND PROPORTION is mainly an arithmetical subject. But there are a few simple propositions of constant occurrence in connection with similar figures in geometry which deserve some special notice in our teaching. Such are:—

$$\frac{a}{b} = \frac{c}{d} \\ \therefore ad = bc \\ \therefore \frac{a}{c} = \frac{b}{d}$$

and again, if $\frac{a}{x} = \frac{b}{y} = \frac{c}{z}$ each of these fractions is equal to

$$\frac{\lambda a + \mu b + \nu c}{\lambda x + \mu y + \nu z}$$

There is not much point in teaching **NEGATIVE AND FRACTIONAL INDICES** except as leading directly to **LOGARITHMS**. And there seems to be general agreement that the study and use of logarithms is better left to the public-school stage.

Instead of pushing further the study of algebra, a more profitable course is to introduce a little trigonometry, of a kind that has been suggested by recent Navy entrance-papers, &c.

IV.—NUMERICAL TRIGONOMETRY OF ACUTE ANGLES AND RIGHT-ANGLED TRIANGLES.—If trigonometry is begun early, it must not be of the algebraic type. The study of trigonometrical identities, addition formulæ, the general angle, etc., though indispensable at a later stage, presents considerable difficulties, and is of an abstract character that renders it unsuitable for an immature mind.

The object of this first-stage trigonometry is to give the pupil familiarity with the use of sine, cosine, and tangent of a single acute angle. No prominence must be given to special angles such as 30° , 45° , 60° ; these angles are of no special interest in practice. The whole work should be based upon four-figure tables of the circular functions: logarithms are unnecessary. The Board of Education publish such tables in a leaflet form (5s. per hundred), giving sine, cosine, tangent, and cotangent for every degree between 0° and 90° . (Messrs. Eyre and Spottiswoode, East Harding Street, Fetter Lane, E.C.)

The best plan is to begin with one function; the tangent is most useful in application to problems. After the meaning of the tangent of an angle has been explained, the class should be set to draw specified angles, say 10° , 20° , 30° , 40° , &c., with a protractor, measure perpendicular and base, find the ratio, and then compare their results with the tables, of which each boy should have a copy. They may then be instructed to construct a graph with the tangents they have already found; if the graph is drawn neatly, the tangents of intermediate angles may be read off from the figure.

The problem should also be set in the inverse form:—Draw an angle whose tangent is $\cdot 7$, and measure it in degrees; verify from the tables.

A varied set of problems in "heights and distances" can now be solved by the use of the tangent alone; and in due course the sine and cosine will be introduced. To define the other three functions as well would be confusing to beginners.

Each problem should be attacked in two different ways—(i) by an accurate drawing to scale; (ii) by trigonometry. The results of the two methods should generally agree to 1 per cent.

In working out the numerical results, contracted multiplication and division should be used. The only identities needed at this stage are

$\sin^2 A + \cos^2 A = 1$, and $\frac{\sin A}{\cos A} = \tan A$. Before the

pupil is shown the reason for these identities, he should actually verify their truth numerically, either by means of tables or by measurement.

Even under our limitation "trigonometry of right-angled triangles," we can do a good deal in the way of solving general triangles: thus, given that $AB = 5$ inches, $AC = 4$ inches, and $BAC = 40^\circ$, to find the other sides and angles of the triangle ABC . Draw BD perpendicular to AC . From the right-angled triangle BAD , find AD and BD . We then have CD ; and from the right-angled triangle BCD we can find BC and the angle C .

There is no reason why this work should not precede the study of Book VI. in geometry; the geometrical principles involved are self-evident. It is found interesting, and can be combined with actual field work with a model theodolite such as that made by Messrs. Griffin (price £3 16s.¹). It affords excellent practice in computation, and requires no difficult or abstract reasoning.

With regard to the balance of different subjects in elementary mathematical teaching, it is to be hoped that the Mathematical Association Committee will be able to suggest some arrangement which will be acceptable to public and preparatory schools. The convenience of a well-understood co-ordination of teaching would be so great that small differences may perhaps be sunk in the attempt to reach such an end.

In algebra I would, in the earlier stages, insist much more closely than is done at present on the accurate use of symbols as a shorthand language for expressing arithmetical operations, deferring long "sums" of multiplication, division, &c., until much work has been done on simple equations of the first degree as aids to the solution of problems. Later, I would omit much of the harder manipulation with fractions and abnormal index expressions which is now taught, and in place of these devote much time to the development of the notion of one quantity as a function of another, illustrated by plotting graphs on squared paper. The theory of fractional and negative indices should be taught as leading up to logarithms to base 10, but I deprecate the too early use of these in calculation. Arithmetical trigonometry involving functions of acute angles only, and with constant reference to four-figure tables and accurate drawings to scale, should be taught much more generally than it is now. For boys in the higher forms who are but poor mathematicians I have found it an interesting and stimulating change from the weary round of arithmetic and algebra they had trodden *ad nauseam* before. A short course of the same work should, even in the case of good boys, be preliminary to the algebraical treatment of trigonometry.—T. W. Marshall in *Nature*.

SUGGESTIONS FOR THE CORRELATION OF STUDIES.

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THERE is nothing new in the idea of the feasibility of a correlated scheme of studies.

But hitherto its recognition in practice has been remarkable for two things; first, it has been nearly always relegated to the preparatory school of the seminar, and secondly, the correlation in schools for older pupils has been decidedly patchy and haphazard. It is not my present purpose to indicate any broad, general scheme; I shall merely try to make the correlation in the province I have chosen a little less haphazard. Nor are the suggestions original; many of them are the outcome of the united work of colleagues, and have undergone the test of several years' wear and tear. The details connected with the correlation of French are my own.

For the sake of clearness I have chosen the simplest organisation—a school of which the entrance age is ten and the leaving age seventeen; while attention has been given solely to correlation between "English" studies and the modern languages, of which, in this scheme, French stands as the type. History forms the basis of the correlation.

FORM II. (Age 10).—A proper starting-point for English History will be England and her peoples till the time of Alfred; for Geography there is hardly a spot in the country without its local traditions to lend interest to historical events. In this period there is no lack of simple ballad and descriptive poetry to foster a literary taste that we need not here coerce into a formal study.

Let us now try to insert French, remembering that the children are ten years old and that the work is to be practically wholly oral. It may be said boldly that at this stage books are impossible for pupils and impracticable for teachers. Each teacher must work out a scheme—so far as the details are concerned—for himself. He will continually find himself correcting impressions and altering his point of view. First, he will be confronted by this difficulty: if the English History is the basis of the correlation, what line is to be taken with the French? To study English history in French appears incongruous; for a child of ten to study the corresponding French history is ridiculous; moreover, the interest recedes to vanishing point. Is a compromise possible? Alfred, the great king, went on a pilgrimage to Rome. Few would object to his passing through France and keeping his eyes open by the way. He would gather a good deal about Franks, their history and their ways. He might even attract the love of a young prince and bring him to his island—to share his triumphs, and at last form one of that court from which light and learning were diffused. There, the Frank prince would hear songs of the prowess of the fathers of his

¹ See THE SCHOOL WORLD, June, 1902, p. 208.

hosts. He would hear, too, of their predecessors in the island plains. Let the boys draw pictures of Frankish chieftains and English minstrels, let their pictures help in the class-teaching, let them give names to the folk in the story, and the all-essential interest is secured.

FORM LOWER III. (Age 11).—This year will advance the study of English History to the Great Charter. Chapters from "Hereward the Wake," "Ivanhoe" and "The Talisman" judiciously selected prevent study from becoming mere dry-as-dust. The local geography widens out into England, and the physical side of it hardly knows whether to range itself under Science or the Humanities.

We repeat the last French experiment. The Conquest is the salient point of the period; let us turn it to account. A youth in William's army has the best opportunity for observation: soon he will watch the settlement. If he has been fortunate he may even be summoned to the Gemot at Salisbury. If so, he has settled down, and in good time—say, next term—his son, and later his grandson, will be helping to solve the great questions of their day. If one of his descendants is found in arms against John by the end of the summer term, proposals as "sudden" have been made before.

FORM UPPER III. (Age 12).—The great struggle between England and France in the fourteenth and fifteenth centuries forms a centre for History and Geography alike; and from contemporary ballads, Chaucer's "Tales," Shakespeare's plays and Stevenson's romances enough literary material may surely be gathered. The campaigns of the Black Prince and of Henry V. afford everything necessary, and, for the French, I accordingly offer no outline for this period at all.

FORM LOWER IV. (Age 13).—In History the "Age of Discovery" is reached. In politics Spain takes the place of France, and the geography lessons acknowledge the change—paying homage at the same time to the great new world of the West. For Literature we have Shakespeare, Hakluyt, Kingsley and Tennyson to choose from.

It has been assumed hitherto that the class has had no French text, and that all formal grammar has developed naturally from the oral work. It is now right to use a text, and the oral work will continue. Should the text be concerned with the same theme as the oral teaching? Is the historical correlation to be kept up, or is a more literary bias to be given? Again we venture upon a compromise. There is one book which enjoys an exceptional popularity in French schools. It is a translation of Scott's "Tales of a Grandfather." Why not take this French version for our text? It can be made the basis of the oral work, or—far less effectively—room might be found for the Field of the Cloth of Gold, the misfortunes of Mary Stewart or the adventures of Henry of Navarre.

UPPER IV. (Age 14).—With the Revolution of 1688 for a starting-point, a year's work will bring

us to the general settlement after Waterloo. A natural geography selection will be India and North America. For literature there is the whole age of Anne—to be carefully avoided for boys of fourteen; but Southey, Campbell, and Byron in poetry, and Swift, Macaulay, and Thackeray in prose remain.

According to our reckoning, it is the fifth year of French, and literary form is becoming a matter of importance. Without straining the principles of correlation a suitable text is "Paul et Virginie." If there is to be a division between the printed and oral theme, there is the Court of the Grand Monarch, the adventures of Charles Edward, the glamour of Lafayette, or the million possibilities—among them a text—of the Revolution itself.

LOWER V. (Age 15).—The boy who has remained at school so long has been through a course of English History. But if he is to profit fully by it a careful revision is essential. To revise the whole in a single year is not a task for boys of fifteen. So we must be content with the earlier half—say as far as 1485. The Geography will be Europe. Literature now becomes more difficult; for a stilted correlation that precludes a gradually-developed culture must be avoided. On the other hand, if Chaucer and Addison are equally acceptable, choose Chaucer rather than Addison.

Can the same principle be applied to French? Yes, but with discrimination. The study of Chaucer's delightful tales does not correspond for an English boy to the study of fourteenth-century French. The letter kills. The spirit of Chaucer has its counterpart rather in the fables of De la Fontaine than in other, more apparent, resemblances.

UPPER V. (Age 16).—The English History revision is continued as far as Waterloo. For Geography there is the British Empire. In English Literature, naming would be presumption. In French, too, there is no real difficulty; two books occur to me—the "Three Musketeers," and "Picciola."

SIXTH (Age 17).—Now that a fair knowledge of English History has been secured there are several possible courses open, viz:—a year's Ancient History, if the treatment be sufficiently broad; a special period of European History; or the history of our own country and people in the times nearest to ourselves. If Ancient History is chosen, then English Literature offers Tennyson's "Ænone," "Ulysses," and several other pieces, and Byron's "Childe Harold." For French there is Fenelon's "Télémaque." But how absurd to read "Télémaque" if the basis of study is the nineteenth century! In that case parts of Taine's "Origines de la France contemporaine" are not too difficult. Again, to accompany a survey of modern European history a selection book arranged chronologically, such as Ploetz, might be useful.

MODERN IV. AND V. (Age 15-16).—There is no reason why the English studies here should not be substantially the same as those for the Lower and Upper Fifth forms. In French, greater stress is laid on oral work, and with the increased time allowed for modern languages in the time-table

there is room for much practice in general conversation. A modern novel, or some such book as Kühn's "Lesebuch," forms a suitable text.

MODERN VI. (Age 17).—The same diversity of choice in the matter of history occurs here. Modern European history and that of the nineteenth century are alike good, and the modern commercial development of the world serves as a geographical accompaniment to either.

In French, the aim is to keep as modern and idiomatic as possible. The reading will include such works as "Le gendre de M. Poirier" and "Tartarin," while the oral work will deal with modern French everyday life.

Such is a crude outline of a possible correlation. That there are in it many points to which exception may be taken goes without saying; but I am far more concerned with the principle than the details.

TRUE STORY-BOOKS OF ENGLISH HISTORY.

By C. S. FEARENSIDE, M.A. OXON.

HISTORY, in the higher ranges, may become very "analytic" and "philosophic," but it is at bottom, after all, only "story" writ large. All authorities are practically agreed that the teaching of history must largely consist in telling stories, and that in the earliest stage these stories should be actually told by the teacher with the help of appropriate pictures. But it soon becomes necessary to supplement oral stories by printed ones; and it is the object of this short article to indicate some of the best collections of "true stories." When I first projected this paper two years ago—as a kind of supplement to my "Historical Novels and their Uses in Teaching" (SCHOOL WORLD, November, 1900)—I imagined that a list of about a score of books would nearly exhaust the subject. I have, however, gathered the titles of about two hundred books which seem to claim investigation; but neither have I had time to investigate them all, nor should I do justice to so many in the space allotted to me. I have, therefore, limited the sphere of my survey to British history, and to only a small part of that. I have, for the present, excluded source-books and readers definitely meant for school use, and therefore, in most cases, "text-book," and I have confined myself to books which could be presented as gift-books to the average boy or girl without arousing his or her resentment at receiving Gregory powder when jam was expected. And even within the sphere of British history I have practically paid no attention to the mediæval or Victorian ages, nor to voyages of discovery, nor to stories illustrative of the fact that "peace hath her victories no less renowned than war." There must be many books containing stories from the early history of Wales, Scotland, and Ireland; but I have not yet come across any satisfactory specimens. And there are various publications setting

forth in modern English the semi-historical legends connected with Arthur, Charlemagne, the Wanderings of the Northmen, Chivalry, and the Crusades; but these I have not found time to examine. This explanation will account for the omission of such books as Mr. Newbolt's "Stories from Froissart," or the two volumes of Mr. Payne's "Voyages of Elizabethan Seamen." Some of my gaps may be filled up by reference to the appendix to Professor Withers' "Memorandum on the Teaching of History" (P. S. King, 3d.); but there is internal evidence that that list, though useful and suggestive as far as it goes, is not exhaustive or based on complete knowledge.

The "True Story-books of English History" catalogued at the end of this article fall into four groups. The first set are quite general in character, the others follow the trend of modern syllabuses in English history by laying some stress on "the contemporary history of Europe and colonial developments" (to quote the New Regulations for the London Matriculation Examination). They deal respectively with leading episodes in European history, with biographical collections (not confined to British men and women), and with the "expansion of England." All of the books have (what our text-books necessarily lack, owing to the conditions under which they are produced) some literary flavour, or at any rate they are not mere hack-work, but are the outcome of "intelligent enthusiasm."

The first group consists of stories about salient facts in English history, arranged in chronological order. Blaisdell differs from the many similar books of English origin in having a useful list of references to poetical and other literary illustrations of the subject. Knight's "Half Hours" is suitable for more advanced readers than the other volumes in the group. The most serviceable set of stories is Green's "Readings," and the editor in his preface gives an admirable apologia for this kind of collection:—

In their zeal to cram as many facts as possible into their pages, the writers of most historical text-books have been driven to shut out from their narratives all that gives life and colour to the story of men. History, as we give it to our children, is literally "an old almanack"; and is as serviceable as an old almanack in quickening their wits or in rousing their interest.

The second group provides the necessary background of European history. Most of the volumes are so well known as to need no further description. But Jane Andrews' "Ten Boys" still requires introduction. It is the work of a successful American teacher, who here describes ten typical boys of different periods in simple language and in such a way as to bring home the great changes which have come over the conditions of everyday life. Though most of these boys are fictitious, their stories are "historical" in a real sense of the term.

The third group deals with "representative men" of all ages and climes, and are suitable for various ages, Carlyle being the most advanced of the four. The books by Mr. Benson and Miss Stirling are expressly designed with the moral purpose of teaching by example. Mr. Murray and

Messrs. Black announce similar biographical collections with a similar purpose; and these, like the books here named, should satisfy enquirers for help in the biographical treatment of history.

The fourth group is somewhat miscellaneous, and may strike many as "drum-and-trumpet history." It will be observed that the volumes included deal with the maritime activity of the Tudor seamen (Froude and Southey), with the early colonial enterprise of the English in America (Mowbray Morris and Tiffany), and with various episodes in naval and military history since the beginnings of the oceanic empire of Great Britain. The admirable collections of Messrs. Mowbray Morris and Laughton were fully described in the February, 1902, issue of THE SCHOOL WORLD. Mr. Fitchett's books are full of good stories, based on the best authorities and told with spirit. Their chief faults are their spreadeagleism and their chaotic arrangement, which, without increasing their interest, diminishes their educational value. Comparison between the Froude and the Southey volumes will be found interesting and instructive. Practically, the books in that group describe most of the incidents whose significance is explained in Seeley's "Expansion of England."

I. General.

	£	s.	d.
BLAISDELL, A. F., "Stories from English History" ... Ginn	0	2	0
CHURCH, A. J., "Stories from English History" ... Seeley	0	5	0
Also published in three parts (1s. 6d. each): (1) Julius Cæsar to the Black Prince; (2) Richard II. to Charles I.; (3) Commonwealth to Queen Victoria.			
GREEN, J. R., "Readings from English History," 3 vols. ... Macmillan	0	4	6
Selected from standard authors. (1) Hengist to Cressy; (2) Cressy to Cromwell; (3) Cromwell to Balaklava.			
KNIGHT, CHARLES, and VALENTINE, L., "Half-Hours of English History," 4 vols. ... Warne	0	8	0
(1) Roman Period to Henry III.; (2) 1272-1603; (3) 1603-1702; (4) 1702-1837. The volumes consist of extracts from what were once standard authors, and are also available in more expensive form (5s. per vol.)			
YONGE, C. M., "Cameos from English History," 9 vols. ... Macmillan	2	5	0
(1) Rollo to Edward II.; (2) Wars in France; (3) Wars of the Roses; (4) Reformation Times; (5) England and Spain; (6) Forty Years of Stuart Rule (1603-1643); (7) Rebellion and Restoration (1642-1679); (8) The End of the Stuarts (1662-1748); (9) The Eighteenth Century.			
Total	£3	4	6

II. European.

	£	s.	d.
ANDREWS, JANE, "Ten Boys who Lived on the Road from Long Ago till Now" ... Ginn	0	2	0
Beginning with the primitive Aryan and ending with the modern American.			
CARLYLE, THOMAS (edited by CYRIL RANSOME), "The Battles of Frederick the Great" ... Arnold	0	3	6
* CREASY, SIR EDWARD, "The Fifteen Decisive Battles of the World" ... Chatto or Macmillan	0	2	6
GARDNER, ALICE, "Rome, the Middle of the World" ... Arnold	0	3	6
Fourteen sketches, extending from Augustus to the sixteenth century.			
* YONGE, C. M., "The Book of Golden Deeds" ... Macmillan, net	0	2	6
Total	£0	14	0

III. General Biography.

* BENSON, A. C., and TATHAM, A. F. W., "Men of Might" ... Arnold	0	3	6
Studies of great characters (from Socrates to Wellington). Written by two Eton Masters for the boys in their forms.			
CARLYLE, THOMAS, "Heroes and Hero Worship" ... Dent, net	0	1	6
Messrs. Chapman and Hall issue numerous editions at various prices.			
* STIRLING, A. M., "Torchbearers of History" ... Nelson	0	3	6
Also in two volumes: (1) Earliest times to Reformation (2s.); (2) Reformation to French Revolution (2s. 6d.).			
MARKHAM, SIR CLEMENTS, "The Sea Fathers" (Columbus to Franklin) ... Cassell	0	2	6
Total	£0	11	0

IV. Expansion of England.

* FITCHETT, W. H., "Deeds that Won the Empire" ... Smith Elder	0	6	0
Mostly dealing with stirring episodes in the Great War, which the author has treated more systematically in "How England Saved Europe." (4 vols., 6s. each.)			
FITCHETT, W. H., "Fights for the Flag" ... Smith Elder	0	6	0
Episodes (mostly naval) from Blake to Inkermann.			
FROUDE, J. A., "English Seamen in the Sixteenth Century" ... Longmans, net	0	6	0
Can also be had without illustrations (3s. 6d.).			
LAUGHTON, J. K., "Sea Fights and Adventures" ... Geo. Allen	0	6	0
LONG, W. H., "Naval Yarns (1618-1831)" ... Gibbings	0	6	0
MORRIS, MOWBRAY, "Tales of the Spanish Main" ... Macmillan	0	6	0
MORRIS, W. O'CONNOR, "The Great Campaigns of Nelson" ... Blackie	0	1	6
SOUTHEY, ROBERT (ed. D. HANNAY), "English Seamen" ... Methuen	0	6	0
Howard, Clifford, Hawkins, Drake, Cavendish.			
TIFFANY, N. MOORE, "Pilgrims and Puritans" ... Ginn	0	3	0
The voyage of the <i>Mayflower</i> and the Plymouth settlement.			
WOOD, WALTER, "With the Flag at Sea" ... Constable	0	6	0
Total	£2	12	6
Grand total	7	2	0
Less discount on £6 12 0	1	13	0
Net total	£5	9	0

* The five books asterisked appear among the sixty books selected by Prof. Withers as suitable for school libraries.

Arrian: Anabasis. Books I. and II. By H. W. Auden, M.A. xxxvi. + 168 pp. With Illustrations. (Blackwood's Classical Texts.) 2s. 6d.—The fact that there is no English edition of Arrian's "Anabasis" is not in itself sufficient, as Mr. Auden thinks, to justify his producing an edition with schoolboy notes. A scholar's edition, with discussions of military problems, would be very welcome indeed. However, if we assume that schoolboys are to have notes for everything, Mr. Auden has produced quite an interesting little book. The "Introduction" is specially so, and we are glad to see that the Editor's English style is improving. We would also call attention to the Appendices on Alexander's army and on Alexander in Legend, and to the judicious military criticisms. The notes are concise and not too many; they are also accurate (but where does Mr. Auden get his theory of the torchrace, ii., 5, 8?). Illustrations are given of Alexander, realistic and idealised, views of graves, and a number of other well-chosen blocks.

THE SCHOOLMASTER IN THE FOREST OF ARDEN.

By CAMILLA JEBB.

WE were two conscientious Englishwomen enjoying a summer holiday at one of the loveliest spots in the Belgian Ardennes, and it occurred to us as such that we might add an element of edification to our enjoyment by taking regular lessons in French conversation. "Let us enquire for some grammar-school master, or daily governess," we light-heartedly said to each other, "who will be glad to earn a few francs so easily." But a couple of days at Les Rochers convinced us that this delightful little town has its deficiencies as well as its endowments. It possesses two thousand inhabitants, very clean streets, cheap and comfortable, though primitive hotels, a water supply which can generally be reckoned upon for quite three-fourths of the year, exquisite scenery and a most charming Walloon population. But baths, books, newspapers, grammar-schools and daily governesses, will there be sought for in vain. Secondary education there is none. The half-dozen noble families who reside there send their children to boarding-schools, or employ resident governesses. The better-class *bourgeois* and farmers are educated at the elementary schools along with the peasants, and sometimes have two or three years afterwards also at boarding-schools.

Primary education is represented by three establishments. First, the girls' and infants' school, conducted by a small community of five nuns. Next, the communal boys' school (answering to our board-schools), which numbers about seventy scholars; and, thirdly, the much larger voluntary boys' school (*école adoptée*) under the *Frères de la Doctrine Chrétienne*, a teaching order widely spread in most Roman Catholic countries. These Christian Brothers, in their picturesque *soutanes* and flapping hats, exercised a strong fascination upon our Protestant and insular minds. We half-cherished a romantic vision of taking lessons from one of them, and listening open-mouthed to thrilling tales of monastic life. But any such hope was promptly quashed by the *Frère directeur*, who with chilling politeness referred us to the master of the communal school, pointedly remarking that he, as a married man, *could* receive us at his house without impropriety.

To the communal schoolmaster we applied accordingly. There was no difficulty in finding him, except that arising from the curious local custom of calling a man quite as often by his wife's name as by his own. But, as it is scarcely fair to reveal either of the real appellations here in question, we shall speak of our friend the schoolmaster as M. Wuz, after Jean Paul Richter's delightful pedagogue, whom he much resembled in devotion to his profession and his children and in a childlike power of enjoying very simple pleasures.

M. Wuz, then, was an individual of very attractive countenance and uncertain age. He struck

us as being distinctly more what we are in the habit of calling a gentleman than the average English board-school master. But here the influences of race must be taken into account, for Walloons of all classes, unlike their Flemish compatriots, are famed for the charm of a manner which is "easy without familiarity, and deferential without servility." As regards birth, M. Wuz was merely the son of a well-to-do peasant proprietor. His education, received at a well-known Normal School, seemed scarcely equal in thoroughness to that imparted at English training colleges. He certainly knew much less of the history of his own language than we did.

He received us with much urbanity, and at once consented to instruct us on very moderate terms. As soon as we had succeeded in heading him off from an inclination to talk about subjects and attributes, "for the man," as Sir Walter Scott says, "was human and a schoolmaster," we keenly enjoyed our conversation with him and gained a great deal of interesting information about local affairs in general and local primary education in particular. Some part of this last may prove interesting to English readers, since Les Rochers (an important town in its way) may be fairly taken, along with the districts surrounding it, as typical of the whole Ardennes country.

Primary education in Belgium, and especially in this part of it, is largely under ecclesiastical control. Our friend, as a pious Catholic—he had lately made a holiday pilgrimage to Lourdes—did not particularly demur to this state of things.

M. Wuz was, as we have said, genuinely devoted to his profession, but he did not deny that he found the work severe. Under the Belgian system of state education neither monitors nor assistant teachers are approved of. Everything is arranged on the one-man one-school basis. He had to find occupation for, and maintain order amongst, all the different classes simultaneously. The *écoles adoptées* (i.e., voluntary schools sanctioned by the Government) have here a distinct advantage. In Les Rochers, three brothers and five sisters were assigned to these respectively, as monastic rule does not permit solitary workers. School hours are also long, from 7.45—11 a.m. and 1—4 p.m. Two short intervals are allowed for recreation; but during these, what our friend called the "pedagogic eye" is no less required than at lesson time.

M. Wuz, moreover, found it necessary, in order to satisfy the requirements of a lynx-eyed inspector, to give two hours daily to preparation, which, for merely elementary and thoroughly familiar work, seems a large proportion of time. In winter he was further expected to teach three evenings a week in a night-school for older lads, for which, however, he received an additional salary. There was only one half-holiday in the week—Thursday, and on Sundays he had to appear at church and superintend the devotions of his pupils, a duty which demanded some considerable exercise of the *œil pédagogique*, and, in fact, necessitated standing even during the sermon. Six weeks' holidays are

allowed in autumn, from the middle of August to the beginning of October, a week and a-half at Easter, and only three days at Christmas. The strain of work is thus both severe and long continued. We could not much wonder that M. Wuz declared he would never allow his beloved little daughters to follow his own profession, and would prefer to see them nuns. All primary school-mistresses in his experience early lost their health from over-work.

The programme of instruction is issued by the central government, but certain modifications are permitted in accordance with local requirements. At Les Rochers it included, in the first place, *la religion*, consisting mainly of a catechism very much longer than any of those inflicted upon the happy English child. In the next place, French. This is a subject of considerable importance, as the present population naturally speak Walloon, and it is common enough for children, when they first come to school, not to understand a word of French. Walloon, however, is a Romance dialect much resembling French, and they quickly acquire the last-named language—thanks to their school training.

Arithmetic, history, geography, drill, singing, and hygiene, form part of the programme of instruction. With regard to this last subject, we felt some doubts as to our instructor's qualifications, after one evening when, with the thermometer standing at about 75° Fahrenheit, he received us in a parlour some nine feet by six, with door and window carefully closed. But the undoubted fact that Les Rochers has of late years reached a standard of cleanliness and decency unusually high for continental towns proves that some aspects at least of this question have been successfully impressed upon the rising generation. Great stress is also laid on the inculcation of humanity, and here, again, with obvious success. Cruelty to animals, unless we reckon under that head the use of dogs for draught, is rare indeed at Les Rochers, and cruelty to children seems an unknown crime.

Attendance at school is compulsory in Belgium up to the age of fourteen, but in the Ardennes parents are generally allowed to keep their children at home in summer after they have made their first communion, an event which takes place when they are eleven years old. This is a sensible concession enough, as their services are often needed in summer for taking charge of goats and cows, and during the long winter months they attend school regularly, and often continue to do so till they are sixteen. From this otherwise meritorious custom arises a certain amount of moral danger, as many communes are too small to maintain more than one school, and the sexes are thus necessarily taught together. Our friend admitted that deplorable results sometimes followed from this association of boys and girls well in their teens, and that great watchfulness was needed on the part of the master. In these mixed schools, the teacher is invariably a man, which renders the system doubly objectionable for female pupils.

After thirty years' service, the Belgian primary-school teacher can retire on a pension equal to two-thirds of his salary. At the age of sixty, retirement is made compulsory by a paternal government, which, in this respect, would seem to act wisely. For the work is hard, as we have seen, and besides the worry of maintaining constant supervision, there is the still greater worry of undergoing constant inspection, and of being perpetually obliged to try new methods. The Belgian Government seems much inclined to fuss over national education, and is above all things anxious that it should be kept well up-to-date. It would require a much wider acquaintance with the subject than that possessed by the present writer to decide whether this extreme activity produces better or worse results than our system of comparative *laissez aller*. One thing is certain. The Belgian lower orders, at any rate in the Ardennes, do not read nearly so much as the same class in England. Les Rochers is considered a kind of capital in its own district. There is no larger town to be found within a distance of three hours by rail, and in the summer it is much frequented by tourists. Yet in Les Rochers not a book can be purchased except a Catechism and a Tourist's Guide. The fact speaks for itself. Lending libraries are unknown. The better-class *bourgeois* sometimes possess a few books, chiefly of a religious character, but they are meant to be looked at, not read. Even M. Wuz, though he owned a copy of the "Itinéraire de Paris à Jerusalem," was quite ignorant of its contents, and did not know that it was by Chateaubriand. He kindly lent us two other books: one, "Les Mensonges d'Histoire," he certainly had not read, as it was very strongly anti-Protestant in tone, and he, the most polite and considerate of men, would never have risked hurting our feelings intentionally. The other, of which he admitted his ignorance, was a highly melodramatic but quite inoffensive historical romance, entitled "Patira," obviously intended for the *jeune personne*. These three works, along with a few school-books, seemed to us to constitute his entire library, which, as we have seen, could scarcely be called a well-used one. And M. Wuz was probably the best educated man in the place, with the possible exception of six or seven better-class families.

Newspapers it is also impossible to buy, though they can of course be procured by ordering them from Liege or Brussels. Yet the peasantry take a keen interest in politics, and by some means or other procure information, which is more or less trustworthy, generally less. At the beginning of the Transvaal War they warmly espoused the side of the Boers, but their enthusiasm has cooled of late. They do not particularly love their Dutch neighbours, and have come to see that it is not expedient to make enemies of the English.

But it is now time to say good-bye to M. Wuz. Our parting in the flesh was attended, on our side at least, with genuine regret, and with an earnest wish that our *aux revolvers* might prove the foreshadowing of a solid fact.

THE TEACHING OF ELEMENTARY MATHEMATICS.

A PRELIMINARY Report on the Teaching of Elementary Mathematics, addressed to the Committee appointed by the British Association to consider that subject, by the Assistant-Masters' Association, has been published in the Circular of the Association, and is reprinted below. The document affords additional evidence of a desire to reconstruct the scheme of mathematical work in schools; and the recommendations are in general agreement with those of the Committees of the British Association and the Mathematical Association.

The movement in favour of reform needs all the support that can be given to it, and for this reason the views expressed by the Assistant-Masters' Association are very valuable. It will, however, be a pity if each association of teachers attempts to draw up a scheme of work, and proposes syllabuses of courses, in the various branches of school mathematics. There are quite enough syllabuses already, and the publication of more will only give opponents of reform an additional argument for the preservation of the present system, on account of the definite standard it affords. One of the chief reasons given for retaining Euclid's text is that it is an excellent standard for work and examination, and that if it were abolished confusion would be the result. The obvious reply to this is that the best geometrical teaching and study is done in countries which do not follow Euclid. But putting this aside, mathematical reformers ought not to give representatives of the traditional school the opportunity of pointing scornfully at differences of opinion among them, and this is what will be done if many syllabuses or schemes are issued.

Whatever may be decided as regards details, there is general agreement upon several matters of fundamental importance, and the schools in which no account is taken of them are only those in which reasonable educational principles are not considered. In the first place, it is agreed that an introductory course of work with compasses, protractor, and scale should precede the study of formal geometry. A good teacher knows this intuitively, and, even if he has only Euclid's text to work with, he manages to use it in such a way that the teaching is based upon actual constructions by his pupils. But there are many masters—not excepting headmasters—who still believe that geometry should be commenced by learning definitions, postulates, and axioms, and reading propositions, and these are the men who have to be convinced that a change is desirable.

In algebra the general opinion is that it should be correlated with arithmetic and geometry to a greater extent than hitherto, and that elaborate and complicated expressions which only test manipulative ability should be avoided. It is unreasonable for boys to have to devote so much time to simplifying complicated expressions when

they do not understand the real meaning of a fraction; yet this is often done. Instruction carried on in this way cannot be justified either by the standard of methods or of results.

So much has been said in these columns about mathematical work, by members of the teaching profession and others, that it is unnecessary to go further into the subject. Mathematical masters and several public examining bodies have signified their acceptance of the principles upon which the new movement for reform has been based, so it is possible now to carry into effect changes which were out of the question several years ago. The essential characteristics of the reforms advocated are contained in the subjoined Preliminary Report of the Assistant-Masters' Association:—

I.—The Aim of Mathematics. We consider to be, in the first place, to furnish the mind with those concepts of number and form which give quantitative definiteness to all branches of knowledge.

We believe that incidentally mathematics afford a certain formal training of the mind, although the subject can claim no monopoly in this respect.

II.—Arithmetic. (1) The method of teaching in the early stages should be inductive and concrete. Actual measuring and weighing should be introduced as early as possible.

(2) Decimals should be treated as an extension of the ordinary notation, their nature being illustrated by actual metric weights and measures. Multiplication and division of a decimal by a decimal would, we think, have to follow vulgar fractions.

(3) The decimalisation of English money and English weights and measures should be practised frequently.

(4) Approximate methods should be gradually introduced after the treatment of finite decimals. They should be taught with due regard to rigidity of proof. Appreciation of the degree of approximation should be continually insisted upon.

(5) If "commercial arithmetic" is to be taught at all, the subject-matter should receive more adequate and correct treatment, and the examples should be drawn from transactions as they actually occur.

III.—Algebra. (1) The foundation of algebra should be "literal arithmetic," *i.e.*, algebra should at first be arithmetic generalised.

(2) The minus sign should receive its extended meaning from copious illustrations; and illustrations, not rigid proof, should also be resorted to for the purpose of the "rule of signs."

(3) Algebra should often be applied to geometry.

(4) Logarithms should form an important section of the subject. We believe that the graphic method could be very usefully employed in this connection.

(5) We desire to deprecate the waste of time so commonly practised in mere manipulation of symbols.

IV.—Geometry. (1) We are strongly of opinion that the ordinary deductive geometry should be preceded and continually supplemented by concrete and inductive work.

(2) Whilst "mensuration" might possibly be taught in connection with physics and arithmetic, we believe that the value of geometry would be enhanced by practical applications of the propositions as they occur.

(3) We feel very strongly that Euclid's text is very unsuitable for teaching geometry. But we are impressed with the difficulty of abolishing its use in the face of external examinations. Under the circumstances, we can only hope that examining bodies, even if they insist on Euclid's sequence, will allow greater latitude in methods of proof, and give greater prominence to easy "riders" and applications of geometry.

EDUCATION IN NORWAY AND ELSEWHERE.¹

THE Eighth Volume of the Reports presented to the Board of Education by the "Special Inquiries' Department" is now before the world. It is difficult to see what principle has decided its contents; these are not only multifarious and unconnected, but also, in some instances, extraordinarily incomplete. Thus, after an interesting account of the educational methods in Norway and Sweden, we have a paper on the Training of Teachers in Switzerland and another on the school system of Zurich, which is followed by a short, but very sympathetic, account of the "Écoles Maternelles" of Paris. This paper seems to have been omitted by mistake from vol. vii. on the French Schools; there, it was distinctly wanted, while here, there is neither rhyme nor reason for its appearance. The same criticism applies to the whole of the second half of the volume. We have papers on Instruction in Portugal, Hungary, Servia, Japan; papers on new methods of teaching special subjects in English schools; accounts of School Journeys in English schools; then we go off again to the other end of the world, to read of Education in South Africa and Education of Asiatics.

If these volumes are intended for the information and edification of educational experts, this lack of systematic arrangement must detract seriously from their usefulness.

It is evidently impossible to attempt anything like a review of this educational lucky-bag in a short notice like the present. We will, therefore, turn the attention of our readers to what has been going on in Norway, where the educational problems have been curiously like those now exercising us in England.

During the whole of the last century, Norway appears to have been alive to the importance and the difficulties of a truly national education. No doubt an impetus was given in this, as in other matters, by its separation in 1814 from Denmark, from which certain aristocratic institutions were inherited which did not well fit a nation whose strength and aspirations came from the peasantry.

The classical (kathedral) schools, which worked under the clergy and the University, became an anomaly, and one very hard to deal with. In 1830 these still existed almost unaltered, but private schools had been started in accordance with more modern ideals. Mr. Niesen was headmaster of a large school, divided, like our own public schools, into a classical and modern (real) side. This and similar experiments were only partially successful, and we meet with the complaint, so familiar to English ears, that the *prestige* of the classical side retains all the clever boys to the great disadvantage of the "real" department. By 1857 the "Storthing"

had taken the question in hand, and a Bill was passed by which Latin composition (translation from Norwegian into Latin) was abolished altogether, amid a storm of opposition from the Conservatives.

Since this time the education question has been constantly to the fore, and the controversy has not become milder as the years have passed. Changes in the national life have taken place; contemporaneously the peasantry have learnt to feel their strength, and a lower middle class, equally democratic and strongly imbued with commercial needs, has gradually come into existence.

In 1896, while in England we were fighting over Sir John Gorst's ill-fated Bill, the Norwegian Storting was busy over similar questions. As we read of undue separation between elementary and secondary education, to the detriment of both, of the overlapping thereby engendered, of the length of time spent over classics, of the reasons for and against mixed education, we feel as if we must have stumbled on the report of a "Meeting to consider the Education Bill" in one of our own English newspapers. But here the similarity ends. In England, education problems are decided for the people; in Norway, they are decided by the people for themselves, and, naturally, the results are different. There is certainly no hesitation, no "taking the line of least resistance," about the Bill as passed in the Storting in 1896.

Latin was abolished altogether from all schools supported by public money, and schools were established in the following gradation:—

(1) Elementary and secondary education was united by making the "folke" (elementary) schools the beginning of education for all, rich and poor alike.

(2) This was followed by the "middel" (lower secondary) school, also common to all, and, like the "folke," teaching both girls and boys together.

(3) Then came the "gymnasium" (higher secondary) intended for the higher classes, in so far as they only can afford to keep their children unemployed after the 14 to 15 years of age at which they would have left the "middel" school. The gymnasium is divided into "sides," and, for the present time only, Latin may take the place of some other subject, but as the gymnasia profess to prepare pupils of both sexes for the University, and as no one proposes to do away with its classical teaching, it is difficult to see how the anti-Latin edict can be carried out, in its entirety, even in the future.

Norway appears to be happily free from the "religious difficulty"; there is a Conscience clause, allowing parents to withdraw their children if they choose, and subject to this, religious instruction according to the established Church is given in all the schools and is subject to the supervision of the clergy. The account of education in Norway which we have briefly summarised is given in detail in the volume before us, and will well repay the careful study of all who are interested in the subject.

¹ Board of Education: "Special Reports on Educational Subjects." Vol. viii.

TWO VIEWS OF EDUCATION.¹

EDUCATION is in the air. Even your man in the street has views on the subject. What with speeches in and out of Parliament, articles—leading and otherwise—in newspapers and reviews, and the new books which follow one another with such astonishing rapidity, all dealing with education, it would really seem that we are, as a nation, awaking to the fact that a people's well-being is a measure of the individual intelligence of its units. Would that this awakening were true! But the warning, "use not vain repetitions," applies here; and there is grave danger, now education is fashionable in the political world, that over much speaking may usurp the place of that earnest, patient endeavour which is necessary if our national education is to get satisfactorily re-organised. The manufacture of systems of education and of schemes for the co-ordination of primary, secondary, and university education is easy enough—on paper, but theoretical plans are apt to come to grief when tried by the every-day standard of what is practicable in the school.

But though many of the books dealing with various aspects of education recently published are of doubtful utility, we have no doubt that Mr. Benson's little volume will prove of great assistance to youthful graduates beginning work as schoolmasters. There is little in his pages which will not have occurred to every public-school master of ten years' experience, at some time or other in his career; but there are conclusions that we believe most schoolmasters will have grown out of before twenty years of teaching have been accomplished. One of these is scepticism as to the value of training for teachers. It is true that Mr. Benson writes for the masters in "good public schools," and, after all, these constitute but a small fraction of the great army of teachers, and it may be that Mr. Benson is only sceptical of the value of training for this small minority, and not for the majority of schoolmasters. "Training can never make a man an effective teacher," we are told. This is true enough; but training of a sensible kind will improve even the man who is a born teacher, and save the pedagogic genius from unnecessary expenditure of energy. But more important than this; since there are many schools and few born teachers, training will give us a supply of effective schoolmasters who, without this probation period of guidance, would be miserable men vainly trying to do what they have undertaken to accomplish.

This difference of opinion notwithstanding, we have read Mr. Benson's book with the greatest interest. It is practical, interesting and sympathetic. It would save headmasters a deal of

trouble and anxiety to place a copy of the volume in the hands of every man without any previous experience beginning to teach in their schools.

Mr. Haldane discusses education from the point of view of the man of affairs who has an intimate acquaintance with the educational systems of other countries. In the first two of the five addresses included in his book, education alone is dealt with, while in the remaining three, "Federal Constitutions," "The Appellate Courts," and "Science and Religion," are the subjects under consideration. Mr. Haldane rightly insists that no fruitful instruction of a higher technical, or university, standard can be given in the absence of a good foundation of a general secondary education. He also makes it clear that nothing but harm results from trying to keep elementary, secondary and university education in separate water-tight compartments. These grades must imperceptibly graduate the one into the other, and one thing which will help to do this is a freer intercourse between teachers of all kinds. We commend these broad-minded addresses to other politicians.

THE STORY OF THE BRITISH CONSTITUTION.¹

TO quote the words of the preface, this is "an attempt briefly to set forth the main results of modern historical research in a form acceptable to the general reader," which "may be useful also to students as a preliminary to more exact and detailed work." It is for such students and for teachers that "a list of leading dates has been given at the end of each chapter, and a brief analysis of the contents of the book included in the Appendix," along with some extracts from authorities.

Mrs. Dale has certainly given us a readable account of the development of our institutions from the earliest times to the date of the first Reform Bill. The men and measures of past times are made to live, and many parallels are made with modern ideas. Those of our readers who have to teach history without having given special study to the subject will find much that is enlightening, and many suggestions that will help them to understand what is often obscure in the ordinary text-books. But, owing to the lack of dates in the text, and to the author's habit of making introductory remarks to the various periods, the reader will often be confused as to the order of events. No authorities are ever referred to, and it is therefore difficult to know how far the results of modern research are really embodied in the work. For feudal times, Mrs. Dale has certainly escaped saying anything which conflicts seriously with the latest books; but she misinterprets William I.'s

¹ "The Schoolmaster." A Commentary upon the Aims and Methods of an Assistant-Master in a Public School. By Arthur Christopher Benson. viii. + 173 pp. (Murray.) 5s. net.

² "Education and Empire." Addresses on certain Topics of the Day. By Richard Burdon Haldane, M.P., LL.D., K.C. xvi. + 198 pp. (Murray.) 5s. net.

¹ "The Principles of English Constitutional History." By Lucy Dale. xi. + 509 pp. (Longmans.) 6s.

ordinance on the ecclesiastical courts, she post-dates the introduction of scutage, she allows John to sign Magna Carta, and she apparently ignores the saving clauses of *Confirmatio Cartarum*. Similarly she still believes in the conflict between merchant guilds and craft guilds, and in the wholesale Tudor establishment of grammar schools. From incidental phrases we gather that she writes from the moderate Anglican point of view, and in the sixteenth and seventeenth centuries she does not clearly distinguish between Puritan members of the Church of England and "Independent" separatists therefrom. She attributes "prophesyings" to the latter, and the "Mayflower" voyage to the former. After 1688, the thought of the growth of Greater Britain seems to be the cause of the invasion into a professedly "constitutional" history of much military and diplomatic matter which confuses the story, and the new commercial attitude of England towards the colonies is misinterpreted. There are a fair number of metaphors used to help in the explanation of institutions. Sometimes these are confused, as when "fabrics hang," or "gold is mingled with sand," or when "inanimate nature chooses to interfere." And finally, the book is not entirely free from the old bias which we may best describe as the "1832-Whig" tradition, which uses too freely the words "nation" and "people," which ante-dates the powers of Parliament, and represents the Reform Bill of 1832 as an obviously necessary change. It leads to such statements as that "a student of the English constitution is bound to condemn despots and all their ways," and yet to praise the "popular despotism of Elizabeth." But, with all its defects, and a want of definiteness is among them, we welcome this latest attempt to popularise the story of the British constitution.

GEORGE HERIOT'S HOSPITAL.¹

THE name of this ancient school will be new to most who live south of the Tweed; and they will regret that their first news of it comes when it has ceased to be. It is one of the most unpromising signs of the day that reformers are so ready to end instead of mending, and to sacrifice the traditions of centuries to a sudden access of zeal. Here was an old school, housed in a handsome building like a college quadrangle, in the heart of a great city, which might in judicious hands have risen to real fame; and it is gone, why does not appear in these pages, but gone it is. There were abuses, no doubt; the masters may have been of the incompetent, the discipline harsh, the life rough; yet these things were once true of

¹ "George Heriot's Hospital." *Memoirs of a Modern Monk*, being reminiscences of life in the Hospital. By Clement B. Dunn, M.D. Edin. The Hospital described from an architectural standpoint by Hippolyte J. Blanc, R.S.A., F.R.I.B.A., illustrated with measured drawings by R. Shekleton Balfour, A.R.I.B.A., and a full collection of the Masons' Marks on the building by the late Sir James Gowans. *Memoir of F. W. Bedford, D.C.L., LL.D.*, the last House Governor. By Major Charles Henry Bedford, with Portrait. 211 pp. (Edinburgh: E. and S. Livingstone.)

all schools. If the scheme of the school had been remodelled, so that the old foundationers formed a nucleus, and other boys were admitted on payment of fees, great things might have been done with Heriot's Hospital. However, it is too late now to lament; and we can only express our satisfaction with the interesting record which is here presented to us. It is a pity that a more complete history was not attempted, and the reminiscences worked in; but perhaps that may yet be done.

The hospital has its crop of amusing stories; the master who thought "divers diseases" were those incident to the sponge-fisher or pearl-gatherer; the bent pins on the master's chair; the thousand and one monkey-tricks of a school-boy's diabolical ingenuity. To one who knows the orderly schools of to-day, the state of rowdyism which used to be universal is an extraordinary thing. Then, again, there are local names, such as the *Knaps*, and odd customs. "One of the Knaps' laws, as inexorable as the Medes and Persians, was that if any gentleman appeared in the square wearing a white hat, every boy must touch wood and whistle." In the name of wonder, why? But imagine the perennial delight of the boys in a master who always wore a white hat in summer. He never found out the reason for the hubbub which greeted his appearance. Was there ever another school in which boys plunged into their morning bath through a trap-door in the room above? But we must cease, adding just one word in commendation of the excellent architectural drawings. The discoverer of Cnossos will be interested to learn that one of the Mason's Marks is his "sacred Double Axe." Was Heriot's Hospital the true Labyrinth?

THE CHARACTER OF TIBERIUS.¹

IN this book, Mr. Tarver tries to prove that Tiberius was the best, as he has been called the ablest of Roman emperors, and that the popular view of him is due to the misrepresentations of Tacitus and of local gossip. We may admit at once that the vices ascribed to him have been exaggerated, and that they are explained in part by the fact that Tacitus draws upon memoirs of personal enemies, such as the younger Agrippina. That profound dissimulation which is usually ascribed to him may not have been practised in his earlier years, but may have been forced upon him later by circumstances or by mental derangement. He may have been, probably was, a faithful and loving husband to Vipsania; he may have been a disinterested public man, who undertook office only because he thought it to be his duty and against his own desire; the friendship between him and Caius and Germanicus may have been true, and the murders fathered upon him no work of his

¹ "Tiberius the Tyrant." By J. C. Tarver. 450 pp. (Constable.) 15s. net.

at all. And yet it is possible that in his later years the disillusionment of life and bitter disappointment, together with the awful burden of empire, may have unhinged his intellect and brought out those hideous vices which are connected with his name. Whilst admitting freely his great ability as general and administrator, and even the malicious distortion of facts by Tacitus (of which Mr. Tarver gives many proofs), it is impossible to accept the picture of almost superhuman excellence which is here offered to us in place of the equally incredible monster of iniquity.

But although we must not accept Mr. Tarver's defence in full, yet the book is welcome on several counts. For one thing, it is a useful corrective to Tacitus, and deserves to be pondered by those who study Tacitus in a critical spirit. Again: it abounds in racy and lively pictures of Roman society, and especially of the underground intrigues which, if true (and there is likely to be truth in them), go far to explain much that is otherwise mysterious. Finally, Mr. Tarver's appreciation of political forces is just. We have not seen the importance of the great equestrian order so well brought out before—that order which Mr. Tarver calls the Civil Service of the Empire. The sketch of the political circumstances of the time, the relations of people, Senate, and Emperor, are all well done. And we must not fail to add that Mr. Tarver's own style is full of that humour, although here rather tart in flavour, which forms the charm of his "Observations of a Foster Parent."

NATURE NOTES FOR AUGUST.

By the REV. CANON STEWARD, M.A.(Oxon.)
Principal of Salisbury Training College.

Animal Life.—On August 1st the close time for birds ends. Many of the waders begin to return from their quarters in the extreme North, such as the Knot and the Grey Plover, where they have been breeding. Swifts, the last of the Swallows to come, are the first to go. All adult Cuckoos leave, some young birds remaining till October.

August 12th, Grouse-shooting begins.

Green Sandpiper revisits us. Young broods of Blackcock found in New Forest. Sand Martins assemble in thousands on telegraph wires and roost in withy beds, in which haunts the Hobby Falcon may be seen attacking them.

About this time birds of prey, as owls, abandon their young to their own exertions to procure food.

Note the two classes of Wasps, Solitary and Social. Find the nest-heaps of the great Wood-ant. Read Lubbock on "Ants" and observe their habits.

Entomology.—*Butterflies.*—Look for The Painted Lady (thistles, roads); Purple Emperor (woods, carrion); Azure Blue, Argiolus; the rare Camberwell Beauty comes over to England from the Continent when strong east-winds blow; Red Admiral, Brown Hair Streak, Brown Argus, Pearl Skipper, and Clouded Yellow (clover fields).

Among the *Moths* may be found Dusky Swallow, Dun Footman, Death's Head Hawk (at rest on palings); Trypocena,

fimbria, subsequa and orbona; Copper and Straw Underwing, the Mouse, Feathered Gothic, White Spotted Pinion (*C. Diffinis*), August Thorn, Vapour Moth, Red Underwing, Tissue Moth.

The following *Larvæ* may be found:—On *Poplars*, Poplar Hawk, *D. Furcula*, Bifida and Vinula; Red Underwing and White Satin M. On *Willows*, Camberwell Beauty B., Purple Emperor Butterfly, Eyed Hawk Moth (and on apple-trees), Small Elephant, Red Underwing, *Tæniocampa*, *Xylocampa*, White Satin Moth. *Lime*, Lime Hawk Moth. *Beech*, Lobster Moth. *Privet*, Privet Hawk Moth. *Hops*, Comma Butterfly. *Broom*, H-Psi Moth. *Thistles*, Painted Lady Butterfly, Shark Moth. *Bedstraw*, Small Elephant Moth, Hummingbird Hawk, *M. ocellata*. *Nettles*, Camberwell Beauty Butterfly, Comma Butterfly, Spotted Buff Moth, *A. Triplasia*. *Plantain*, Wood Tiger. *Violets*, Fritillaries. *Small Bindweed*, Convolvulus Hawk. *Reeds*, *Plusia F. Mint*, *Pyrausta P.* (on wood of forest trees) Leopard Moth; (the trunks of large trees) Goat Moth.

Plant Life.—Now are in flower on various heaths the *S. John's Worts*, *Campanulas*, *Veronicas*, *Stachys* (5 kinds), *Calamints* (3), *Composites*, *Umbelliferæ*, *Bedstraws*, and *Hempnettles*, as well as *Marjoram*, *Catmints*, *Horehound*, *Nettlewort*, *Orobanche minor*, *Soapwort*, *Bladder campion*, *Navelwort* (walls), *Purple Loosestrife*, *Wild Mignonette*, *Rock Rose*, *Creeping Cinquefoil*, *Colchicum* or autumn crocus, *Evening Primrose*. Look in the woods for *Betony* and *Winter Green*; in boggy places and streams for *Herb Bennet*, *Drosera*, *Bog Ashodel*, *Lathyrus palustris*, *Bog Pimpernel*, *Yellow Marsh Saxifrage*, *Knitted Spurrey*, *Pescicaria Bistort*, *Water Germander*; and by sea-shore and salt marshes, *Sea Holly*, *Sapphire* (cliffs), *Thrift*, *Sea Lavender*, *Statice Reticulata* (marshes *E. Anglia*), *Erodium maritimum*, *Portland Spurge*, *Zostera marina* and *Sea Purslane*. The Deptford Pink, *Irish Menziesia*, *Scottish Asphodel* and several *Sedum* flower in this month.

Folk-lore:—

All the tears St. Swithun can cry,
St. Bartlemy's mantle wipes them dry.
St. Bartholomew (August 24th)
Brings the cold dew.
If the 24th of August be fair and clear,
Then hope for a prosperous autumn that year.

AN INQUIRY INTO THE SLOPE AND STYLES OF WRITING.¹

THE following discussion is based partly on experiments and partly on the general principles of psychology and facts of experience.

Habits to be Encouraged.

Children, in first learning to write, use the finger and wrist movements. Such movements by their small hands produce very small letters, and the teacher must give a great deal of attention to the movement of the full arm in order to train the child to make use of the movements which permit the formation of larger letters. The full-arm movement when the elbow is resting on the desk, for which we have used the term full-arm movement with rest, is much more rapid than the finger and wrist movement. One of the subjects in some of the experi-

¹ Abstracted from a paper by Dr. Cloyd N. McAllister, published in *Studies from the Yale Psychological Laboratory*, vol. viii., copies of which can be obtained from Messrs. Williams and Norgate, 14, Henrietta Street, Covent Garden, London.

ments used the forearm movement for writing his signature—that is, the side-to-side swing of the forearm—the direction of the line of writing is nearly toward the body, or more exactly in line with the forearm. A backward movement of the whole arm carries the hand along the line, while the side-to-side motion of the wrist and forearm makes the separate strokes. The top of the paper, for this form of movement, must be inclined to the right. This movement produces writing with very sharp angles. It is certainly an easy movement, but the head will be inclined toward the right to make the reading easier for the oblique position of the paper. The straight middle position for the paper would cause the elbow to be pushed outward and forward, so that the forearm may be parallel with the bottom edge of the paper; this encourages a stooping of the shoulders, and necessitates bending the head forward so that the chin is pressed closely to the throat, compressing the air passages. Such a position cannot be used in the schools, and we question the value of using it even for adults. The finger and wrist movement permits round forms for the letters, and so a more legible hand; it is very much slower than the full-arm movement with rest, requiring not less than 16 per cent. more time than those movements, so that the loss of time in producing the writing doubtless balances the gain in legibility.

Experience has shown the teachers of penmanship that neither movement, by itself, should be used to the exclusion of the other; if used in combination, the freedom of the forearm can be united with the more delicate touch and shaping power of the fingers, enabling the writer to execute easily and rapidly, with less fatigue than with either movement separately. For small children, the greatest attention should be given to developing a good full-arm movement. Even with much care in this direction the fingers will be used largely. This means of course that the elbow is to rest upon the desk. The child is unable to coordinate properly the movements of the arm. If the arm does not rest upon the desk, it will be held tightly to the sides of the body in order to aid in the control of the movement. After the arm has been well trained, the rest will often be considered not necessary. The trunk of the body should be inclined a little forward, the back straight, the upper arms hanging nearly vertical; the breast not touching the front edge of the desk. If the desk is sufficiently low, this permits an easy position for writing. The head, inclined slightly forward, should not be brought too close to the writing. The left forearm should be so placed that it will make an angle of about 60° with the right forearm. All the larger movements should be made with the full arm, also all of the strokes directly up and down. The fingers should aid in forming the turns, producing thereby broader turns than the full arm movements alone would tend to produce.

Training Preliminary to Writing.

The preliminary training of the child should be to give it perfect control of the hand. Clay modelling in the kindergarten is available for this purpose. This should be accompanied by the use of the brush. Most children have the slate or lead pencil placed in their hands at the start. The slate or lead pencil requires a firm grip and some pressure in order to produce friction enough to make the path of the point visible. The habit thus formed of gripping the pencil is seldom eradicated.

The narrow path of the pencil permits small figures, the wrist or edge of the palm near the little finger rests upon the table, and the hand is moved by short, limping steps, along the line. The broader path of the brush makes a small figure or character impossible for the small hands, and a large full-arm

movement is easily acquired. By the continued use of the brush a higher degree of muscular sensitiveness is gained; the child soon learns to make finer and more regular lines. The bright colours and solid figures produced by the brush are of much more interest to the child than the empty outlines produced by a pencil. No attempt should be made to form letters until the child has acquired a fair degree of control of the movements of the arm. This should be followed by producing large letters with the brush, care being taken to see that the forms of the letters are properly impressed upon the child.

The use of the pen will follow naturally from this. The brush does not require a hard grip, and the pen will be held lightly. Soft pens and light penholders should be used. Attention should be given to the manner of holding the pen; the wrist or side of the palm must not rest upon the table; the third and fourth fingers should support the hand. The ink used should be a heavy black or dark blue, and the paper a light yellow.

The slate has become a matter of history at least so far as American schools are concerned. The lead pencil will always be used, but the child should be furnished with very soft ones. The earlier training with the brush and pen will have taught the child how to prevent rubbing the soft pencil-mark.

The Best Slope for Writing.

The question of economy in time always enters into the discussion of any system of writing. By means of experiments it has been recognised that the most rapid short movements are those made by swinging the forearm back and forth, resting on the muscles below the elbow as a pivot.

The exact angle at which the movements must be made with reference to the body had not been determined previous to the experiments here recorded, but the direction was well enough determined to cause the exponents of the sloping systems of writing to affirm that a slope of 48° permitted the most rapid writing.

Four positions of the writer may be properly assumed, but since the demands of school hygiene are that the front position only should be used, we will consider that position only. For such a position the students are instructed to sit directly in front of the desk, keeping both sides equally distant from it. The paper should be turned so that the bottom edge forms an angle of 20° with the edge of the desk. If a slope of 48° be added to this angle we find that the down strokes, that is, the strokes determining the slant, are 68° from the horizontal axis or the front line of the body. The slope recommended for general writing and for instruction in the schools is 52° ; this in like manner would mean an angle 72° to the horizontal.

The up strokes of the letters are made at an angle of 34° to the base line, for the angle 54° . Exceptions to this rule are found in the case of the letters *r* and *s*, the initial stroke of which would be at an angle of 39° to the base line; and of *z*, the up strokes of which should be at 45° . Thus the up strokes vary from 34° to 65° from the horizontal axis. The slant that results in great beauty is 60° . The range of slant varies from 68° to 80° with the horizontal axis, according as speed or beauty is most required.

The experiments on large movements have shown the great tendency to change the slope toward the direction most easily made. The hand in trying to use a slope between 60° to 48° would unconsciously take a slope of from about 50° to 38° . The lines lying at such small angles to the base line become hard to distinguish. The distances between the lines are very much diminished as the slant from the vertical is increased, and the turns, being more and more narrowed, come to be angles. Such angular writing is very hard to read rapidly.

The hand acquires a slope in writing that is usually farther removed from the perpendicular than the model used as a copy in learning to write. This has been observed by teachers of writing. By the time the habit had been acquired, and the individual's style developed, it was found that the slope used was a much greater deviation from the vertical. The vertical systems, which gained general acceptance so quickly, form an excellent means of producing a legible and rapid hand. The child is taught to make his strokes vertical; the hand acquires the habit, and the deviation from this direction is not usually more than 10° . The paper before the writer being square with the desk immediately in front of him, the downstrokes take the directions from 75° to 90° .

Style in American Schools.

The public schools no longer insist upon the strictly vertical forms for every pupil. Objection is made to the position of the paper before the middle of the body. For a paper five and a-half inches wide, the left side should be placed directly in front of the middle of the body, according to many instructors. The Supervisor of Penmanship in the public schools of a city, where one of the vertical systems is used, suggests that for older pupils, and to aid in rapid writing, the lower left-hand corner of the paper should be moved even farther to the right—perhaps an inch and a half—and the top of the paper then inclined towards the left about ten degrees. This means that the slant taught would be one of about 80° with the base line, and it is not surprising to find that, when the individual's style is acquired, it proves to be a slope of about 75° or that of the copy used by the business-college men.

Because of the construction of the arm, the movements are more rapid in some directions than others, and the attempt to make a line of any given slope will result in a slope which approaches nearer the easiest movement, except where a conscientious effort is made to prevent this; in writing, no such effort is made. A copy of considerable slope, though legible, will produce a style of writing with a greater slope and less legibility; it is in this that the vertical systems have a decided advantage over the older.

A very near approach to the copy is of course desirable, but is not attained by most writers, and never in any case without long practice. Because of the tendency to increase the slant from the vertical, children when learning to write are unable to produce results that can be easily read. With the so-called vertical systems, an increase in the slope, though found, is not sufficient to render the writing illegible, and a readable hand is more easily acquired.

The greater the slant from the vertical axis the more rapid will be the writing, even to the extent of causing the principal strokes to make an angle of 45° or less with the horizontal axis. Such a direction for the strokes would require that the top of the paper be turned somewhat toward the right, in order that the resulting writing may have the necessary slope with the base line to make it legible.

The strictly vertical slopes are not so easy to make. The slant of about 75° permits legible writing; as the slant approaches the vertical, it is of course more legible, but as the angle decreases below 70° the legibility decreases rapidly.

Elliptical slanting up-strokes, as the experiments show, are more rapid than the vertical straight strokes, but speed is not a consideration for the beginner. For the young child, the purpose is to fix upon him the visual and muscular sense images of the different letters and to associate them properly. When the letters, such as *m*, *n*, *w*, *u*, *l*, and so forth, have the up and down stroke coincidence as far as possible, the appearance of the letters is much more simple, and the form more easily fixed in the child's mind.

Precautions to be Observed.

A base line is desirable that the eye may more surely guide the hand in writing a line across the page, or in properly lining the letters in a word. Other lines on the paper will cause the child to give more attention to the spacing and height of the letters than to the form. Much energy will be devoted to causing the letters to just touch the top line; the head will be drawn down to the paper, the back curved and the shoulders bent forward in the attempt to see just beyond the point of the pen, so that it may not be moved too far in the upward stroke.

Connecting the letters is desirable; for, as the child slowly moves the hand in producing the up stroke, the eye has time to estimate the distance, and the tops of the letters are for that reason very nearly in a line. Without these guiding lines, the tool used in writing is raised from the paper at the base line; the movement toward the place from which to begin the formation of the next letter is rapid; the muscles, not trained, over-estimate the distance, and the top of the next letter is often half the height of the letter above where it should be. The child may be governed by the size of the copy and so make this letter entirely above the line; or, if much has been said about writing on the line, the letter may be made enough larger than the copy to permit of its resting on the line. The next jump may be underestimated in the endeavour not to go too high, and, to make the letter full size it must extend below the base line; perhaps influenced by the strict injunction to write on the line, the letter is reduced in size to suit the space. Such results are discouraging to the child. With connecting lines, the movements are made more slowly, and the distances estimated. As skill is acquired, the pupil may see that these lines are not essential parts of the letters and may omit them altogether; but this will not happen until speed has been acquired, and the need of reducing the time of forming the letters results in dropping all unnecessary lines.

Separated letters may be made more rapidly than connected ones. It is a great strain on the nerves of the hand and arm to attempt to keep a constant pressure on the paper for all strokes. Raising the pen or pencil from the paper removes this strain; the upward movements may be made much more freely and with greater ease if it is not necessary to trace the path of the movements on the paper. The up strokes at the beginning and end of a word, which the small child must make with so much care in the older systems of writing, are of no assistance to the reader, if they do not actually hinder him. For rapid reading, only the lines essential to the forms of the letters should be on the paper.

The shading alternating with fine hair-lines contained in some of the older "advanced" copy-books provided a means of relieving strain by varying the pressure. The hair lines were always the less important ones. Many rapid writers make few lines with the upward stroke of the pen. These movements are harder to make than the down strokes. If the hand is trained well to move the proper distance, the line of the writing is not badly broken by a failure to estimate the distance in the rapid upward jump of the pen; nor is the forward movement in passing from one letter to the next overestimated to such an extent as to destroy the continuity of the word. This training, we believe, can be more easily acquired by using connecting lines with beginners.

The Instruction of Beginners.

For the beginner, we would suggest that: the copy contain all the connecting strokes; that in the letters *m*, *n*, *u*, and similar forms, the up strokes coincide with the down strokes as far as possible, producing broad round turns; that the slope be 90° ; that the paper be placed straight before the child, the left edge on or a little to the left of the median line.

If the up strokes slope off from the down strokes in the letters mentioned, the legibility is not so great and the illusion produced by the copy is that the down strokes slope backward. Such a copy might cause the child to write a back hand.

The copy may show the lines connecting the letters without a break in a word, but we should not insist that the pen be not raised during the writing of the word; it doubtless will be raised, but the downward strokes will meet the connecting lines, and the child will be aided in estimating the height of the letters and the spaces between them. The position suggested for the paper permits the child to follow the pen more easily with the eye. With such a manner of writing children will acquire a legible hand quickly. The great mass of the people who leave the schools early in the course will be able to write a legible hand.

There should be no studied effort to disconnect the letters. Such an effort may cause a full stop at the close of each letter. If the hand has been trained to a continuous movement, when writing rapidly without any effort to raise the pen, it will be seen to jump over the distance in the upward strokes when the down strokes must retrace the path made by the up strokes. This manner of writing soon leads to the omission of many of the connecting lines. The result is more legible than before these lines were committed, and the speed is increased by the saving of time in the rapid free movement of the pen.

The sizes of the letters should be reduced considerably from the large copy placed before the beginners. Each pupil should be allowed to make those sizes naturally agreeable to him, after the forms of the letters have been thoroughly mastered. The space between the lines should be sufficient to prevent any appearance of crowding, and to permit paying no attention to the lines.

The lines are often a means of retarding the speed, for some attention is given to keeping on them. If the hand has been trained to write on a line, it will not be a difficult task to continue in a straight line without the aid of the ruling.

When speed is demanded from the advanced pupil, a slight slanting of the paper to the left may be suggested. The movement in forming the letters is now a fixed habit, and their direction with reference to the body will not change. The result is that a slant between 75° and 85° is now used; this is legible and permits greater speed than the strictly vertical.

The question is often asked: Is there any valid objection to teaching a back hand? The experiments recorded above show conclusively that there is at least one valid objection, that is, such a slant requires movements that are comparatively very hard to make and so reduces the speed to such an extent that it must be considered impracticable.

A COURSE OF ELEMENTARY AND EXPERIMENTAL PLANT-PHYSIOLOGY.

(Communicated by Prof. L. C. Miall, F.R.S.)

II.—SEEDS AND SEEDLINGS.¹

THE first part of the "Course of Elementary and Experimental Plant-Physiology," of which the following is the second instalment, dealt with "Leaves," and was prefaced by an introduction explaining the character of the schools for which the work is suitable, the objects the authors have in view, and the general conditions under which methods of teaching by inquiry

¹ The course has been drawn up by Professor Percy Groom, of Cooper's Hill; Professor M. C. Potter, of Newcastle; Mr. Harold Wager, Inspector of Science and Art Schools; and the following members of the staff of the Yorkshire College, viz., Professor Miall, Dr. W. G. Smith, and Mr. N. Walker.

are possible. Teachers of botany who have not read this introduction should do so, and will find it in our issue for February, 1901.

(1) Broad beans and wheat are suitable for a first course of study. Plant in wet sawdust,¹ four weeks before the first lesson, enough seeds of each kind to supply every member of the class. Provide a similar quantity of third-week, second-week, and first-week seedlings for following lessons, taking care that each is ready on the very day when it is to be examined. April and May are the most suitable months.

If we take two plants, and four stages of each, there will be eight seedlings to be examined by every pupil. Should this be too many, take only the bean in the first instance, and postpone the wheat to a later part of the course.

(2) Take a number of dry beans, and find out how much water must be added to them to make up the volume to 100 c.c. Place the beans in wet sawdust for three days; again determine how much water is required to make up to 100 c.c. What does the difference indicate?

(3) Study the whole series of seedlings one by one, taking the oldest first, and working back to the seedlings of one week's growth. Let each pupil draw his own seedlings to scale.

(4) Note the parts of a bean seedling, its seed lobes (cotyledons), primary root (radicle), and primary stem (plumule). Study the rootlets and their arrangement. Make out, by measurement of the successive internodes of the stem, its mode of expansion. Why are the rootlets arranged in vertical ranks? See whether any light is thrown upon the question by cross sections of the root.

(5) What are the most obvious differences between a bean seedling and a wheat seedling? Do not prematurely tell the class what are the differences between a monocotyledonous and a dicotyledonous seedling; that is to lose an opportunity.

(6) Study a bean seed soaked in water for two days, and also a dry bean. Observe the seed coat, the place of attachment (to what?), the place where the pollen tube entered (how can this be discovered by the class?), the parts within the seed coat and the way in which they are arranged.

(7) Study a grain of wheat in the same way, comparing it in every particular with the bean seed. Observe that the wall of the ovary (pericarp) is here completely adherent to the seed coat. Note the deep furrow running along one side of the grain; at the base of the opposite side is the embryo. At the upper end of the grain is a little tuft of hairs (what are these?). Select a grain with a prominent embryo. Grains just ripe, preserved in alcohol, are best; but dry grains, softened for two hours in water, will do. With a mounted needle remove the pericarp and testa overlying the embryo. This will expose the radicle and plumule. Carefully remove the embryo from the grain by inserting the point of the needle beneath the upper end of the embryo. Behind the plumule and radicle the shield-like cotyledon will be noticed, with its smooth outer face which was applied to the food cells (endosperm). Examine with a pocket lens the cavity left in the grain after the removal of the embryo. Scratch the floor of the cavity, and determine what lies immediately beneath.

Cut through another grain, so as to halve the embryo, and study the parts with a lens. The radicle will be seen pointing towards the micropyle at the very base of the grain, and, perhaps, the apex of the stem with two or three undeveloped leaves. A transparent, stained section will show the parts more clearly. Notice in the section a minute scale arising upon the side of the embryo opposite to that which bears the cotyledon, and at about the same level. What is this scale? Possibly a second cotyledon. What is there above the embryo, filling the

¹ The box should be a foot deep, to allow sufficient room for the long radicles of the beans.

chief part of the grain? Is there any store of food in a wheat grain? If so, of what kind, and where situated?

(8) Enquire what becomes of the food reserves during the germination of a seed. If starch, once present, disappears, to what can its disappearance be attributed? What caused the disappearance of starch in the green leaf? Is the same explanation applicable here? How can the disappearance of the starch from the seed be made visible? Take a bean seedling in which the stem has begun to push vigorously; cut thin sections through a cotyledon, and look out for corroded starch-grains. Take a wheat seedling, whose first leaf has pushed out, make sections of the food reserve, and see if any corroded starch-grains are present. While starch disappears from the embryo or seed, it often forms elsewhere. Try to find it in the bean and wheat seedlings.

(9) Which grows most vigorously in a young seedling, the stem (plumule) or root (radicle), and why? Which first emerges from the seed coat? Study the elongation of the radicle. For this purpose, take two or three beans with radicles an inch (25 mm.) long. Mark the radicles with transverse Indian ink lines, 2 mm. apart. Keep under conditions favourable to growth¹ for several days. Then note the distance of the marks, and see in what region growth has been most rapid.

(10) The fine hairs on the radicle must have been frequently noticed by this time; let us examine them more carefully. Raise a number of seedlings of mustard on wet flannel. On what part of the radicle are root hairs to be found? Why are there none on the root tip? How can we prove that their duration is limited? Make out the region of root hairs in an old seedling of bean. What is the use of root hairs? Have they any power of fixing the plant?—any power of absorbing water?—any power of absorbing solids? See whether the root hairs adhere to the flannel. If so, try to discover how. See whether seedlings can absorb some of a weak solution of eosin in water, or finely powdered carmine.

Collect from what has now been seen a general statement as to the uses of root hairs.

(11) The path of the water in the root may be shown by suspending a seedling with the lower half of its root in a 0.5 per cent. solution of Hoffman's violet for two or three hours. Then remove the seedling, and cut across the root a little distance above the coloured part. Examine the cut surface with a pocket lens.

Let the radicle of a fresh seedling rest on litmus paper. Is there any change of colour? If so, what does it indicate?

(12) Grow some seedlings in earth laid upon a slab of polished marble. The tracks of the roots will be marked by a slight corrosion of the polished surface. What conclusion is to be drawn from this?

(13) At a certain point in its growth some part of the seedling turns green, but at first there is no green to be seen in it. What difference does it make to the living seedling whether it has green tissues or not? Devise an experiment to show whether (a) a seedling devoid of green tissues, and (b) a seedling possessing green tissue, can fix the carbonic acid of the air.

(14) Let us next investigate the conditions necessary for germination. Take a number of large bottles, and put into each two beans with enough sawdust to cover them. Letter each bottle, and treat as described below. Except where otherwise directed, the seeds are to be kept moist, supplied with common air, exposed to ordinary diffused daylight, and to the ordinary indoor temperature.

(a) Seeds kept quite dry.

(b) Seeds supplied daily with a little carbonic acid.

(c) Seeds supplied with carbonic acid only.

(d) Bottle kept in the dark.

(e) Bottle kept cold with ice.

Note the results, and draw up a statement of the physical and chemical conditions which favour the germination of seeds.

(15) Place a number of soaked peas in two tightly-corked flasks, which are not to be more than half filled. After twelve hours remove one of the corks gently, and insert a lighted taper. What follows? Pour lime-water into the second flask. What conclusion can be drawn from these experiments?

(16) Place some peas in wet sawdust at the bottom of a tall jar. Burn up the oxygen with a taper, and immediately seal up the jar. Note the effect upon the germination of the peas.

(17) Pin several soaked peas or beans to a piece of wood floating on water. Let some be entirely immersed, others partly immersed, and others quite out of the water. Leave them to germinate, and note the results. What conclusion can be drawn from this and the preceding experiment?

(18) In some animals the oxidation of carbon compounds and the liberation of carbonic acid are accompanied by a rise of temperature. Give examples. Is the same thing true of a seedling? Determine with suitable precautions, and under precisely similar conditions, whether there is any difference in the temperature of a mass of germinating peas and a mass of peas killed by boiling.¹ A little corrosive sublimate should be added to the water in which the peas are boiled to prevent the growth of bacteria and moulds during the experiment. What name do we give to the taking-in of oxygen and the liberation of carbonic acid by animals? Does any similar gaseous exchange take place in a seedling or in a full-grown green plant?

(19) Fix a sheet of glass in a sloping position in a wooden box. Put wet sawdust and broad beans above the glass, placing the beans so that their roots will press against the glass. This gives a good view of the root and its branching.

(20) The same box and glass plate can be used for another purpose. When the bean roots have grown, say, an inch long, tilt the box so that the upper edge of the glass plate is decidedly sloped in the direction of its length. What effect has this upon the direction of the main roots?

PART II. (for more advanced pupils).

(21) It is supposed that the preceding sections have been worked through previously. At some later time the following seedlings, or a selection from them, may be studied:—Pea, lupine, kidney bean, melon, sycamore, oak, ash, sunflower, buckwheat, date-palm, pine. To these should be added at least one which has never been carefully examined before, in the hope that it may exhibit some new and interesting feature. Our enquiry now becomes comparative. Unless it is desired to protract the life of the seedlings for some special reason, all the seeds may be germinated in sawdust, and, if more convenient, indoors.

(22) Compare seedlings of broad bean, pea, oak, lupine, melon, sycamore and sunflower. Draw them, and note their resemblances and differences. There is one important respect in which the cotyledons of the first three differ from those of the last four; what is it? Give examples to show that the cotyledons may differ in number, form, thickness, and mode of packing within the seed; after germination they may differ in colour and texture. What differences in position and in function are associated with difference in colour? Compare a

¹ A good plan is to let the radicle grow down the tube of a thistle-headed funnel, supported in a flask of water; the seed should be kept covered with damp blotting-paper or a watch glass.

¹ The seeds may be placed in a test-tube, into which the thermometer bulb is passed. Pack the tube with cotton wool in a cardboard box, and cover all with a bell-jar or other screen.

fully-developed green cotyledon with a foliage leaf. Does it possess stomates, palisade cells, spongy tissue, veins? Do you find any seedlings which are intermediate between the groups with underground and above-ground cotyledons?

(23) Study the escape of the embryo from the seed coat in sunflower and melon. Which end of the cotyledons is first extricated? What advantage is gained by the arching of the hypocotyl (part of the stem intermediate between the radicle and the cotyledons)? Observe that the root soon becomes firmly fixed in the earth—how? The seed may become fixed in the earth too. How is this effected in the case of sunflower, corn-cockle and linseed? Sow each in moist earth, and determine the manner and the degree in which the earth adheres. If the root, and also the seed, can be fixed in the earth, it will not be difficult for the seedling to draw its cotyledons out of the seed. How is it done? Show that the melon seedling has a special way of extricating itself from the seed coat. After germinating for a week or so, we can discover a thickening which grasps the lower edge of the cleft seed-coat. How does this aid in extrication?

(24) Some seeds have nothing within the seed coat but an embryo; others have a store of food as well. Give a known example of each kind. Here are a number of seeds in alphabetical order: ash, buckwheat, corn-cockle, maize, melon, oak, pea, sunflower; to which kind does each belong? After soaking in water for a few hours, sections of the seeds may be cut with a razor, or the larger ones may be dissected. Make drawings to show the arrangement of the embryo and the food store, where these are distinct. Determine in which of the seeds named the food store contains starch.

(25) Take date stones germinated in moist earth. Search for the embryo by halving the stone. Notice the enlarged end of the cotyledon. What change does the stone undergo during germination? Is any starch to be found either in the embryo or the stone which encloses it? By examining a succession of date stones sown one after another, something can be learned as to the use of the stony part. Compare the seedling of the date with that of wheat. Does the date seedling throw any light upon the nature of the large scale of the wheat seedling?

(26) Raise an equal number of seedlings of the same kind in the dark and in the light, sowing all in good garden mould. Determine the dry weight of several examples of each weekly, and go on till several leaves have been put forth. Plot the results in curves, and account for the results obtained.

(27) Study the forms of the first true foliage-leaves in any plants which have been raised from seed. Notice that they are often of simpler form than those which appear later; Umbelliferae, milfoil, buttercup, and shepherd's purse are examples. Sometimes they are more ordinary (*i.e.*, resemble the leaves of nearly-related plants more closely) than the later leaves, which often have a very peculiar form. *Tropaeolum majus*, the nasturtium of gardens, has peltate leaves, an uncommon shape in Geraniaceae; but the first foliage-leaves are three-lobed, which is a common shape in this order. In furze the later leaves are reduced to spines, but the early ones are trifoliate, like those of clover and many other leguminous plants.

Remark also the usual succession of leaf shapes in water plants with broad floating leaves. They may be successively (1) filiform, (2) elliptic, (3) sagittate, (4) peltate (white water-lily; or (1) filiform, (2) elliptic, (3) sagittate (*Alisma* and *Sagittaria*).

Keep notes of any such sequences in plants raised from seed, and try to discover what they mean. Why are most cotyledons of simple shape? Why are the cotyledons broad in mustard, &c., long and narrow in sycamore, &c.? Set down other questions which occur to you while you are watching seedlings. Do not think it likely that the first answer which presents itself will

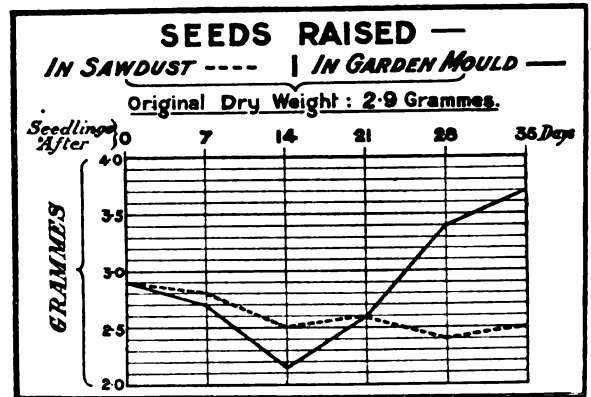
be the right one; it will generally be wrong, and the right answer will in the end be recognised by its fitting many other cases besides that which first attracted your attention.

(28) Fix a bean seed in a wide-mouthed bottle by a wire passed into the bung. Pour a little water into the bottle, and line it by a layer of blotting paper, which dips into the water. Observe the growth of the seedling, the escape of the radicle, its elongation, its direction of growth, &c.¹

(29) The radicle at first points downwards; does it always point vertically downwards? How is its direction affected by tilting the vessel through 15° and 30°? Take two bean-seedlings raised in air, as in section 28. When secondary roots have pushed out, rotate one of the seedlings through a vertical angle of about 30°. After a week's further growth, determine the way in which the primary root or radicle, the secondary roots, and the tertiary roots respond to the pull of gravity.

(30) Coat the vessel outside with opaque paper, leaving a narrow vertical chink on one side. Fix a seedling at 90° from the chink. Is the radicle deflected? If so, is it deflected towards or away from the light?

(31) Pass the roots of germinated linseed through perforated muslin tied over a tumbler filled with water. Place the tumbler on the window sill, and observe the behaviour of the shoots and roots.



(32) Place a slight obstacle in the path of a radicle, *e.g.*, a strip of lead or tinfoil, supported at one end. Determine (by comparison with weights) what power the tip of the radicle has of overcoming resistance.

(33) Place a firmly-supported marble in the path of the radicle. See how the radicle behaves, and try to explain (1) the difference in response to pressure between the tip of the radicle and the part just above the tip; (2) the advantage gained thereby when the radicle has to make its way through stony ground.

(34) Lay a glass beaker on its side. Put a small sponge, soaked with water, in the closed end, and leave the other end open. Fix a bean seedling in the middle of the beaker by means of a little wet blotting-paper. Notice whether the radicle bends inwards or outwards.

(35) Allow a radicle to grow downwards over an inclined (60°) and smoked glass plate, so placed that the radicle is forced to come in contact with the glass. What indications can be discovered of a movement of the tip towards and away from the glass, or from side to side?

¹ In some laboratories moulds invariably appear, and destroy seedlings raised in closed vessels. The growth of moulds may be hindered by sterilising the vessels and their contents with formalin solution (4%). The solution may be applied to whole seeds, but it injures radicles and growing tissues.

(36) Raise two sets of the same kind of seedling, say, beans, one in sawdust and the other in good garden-mould. Place both in a garden border side by side, so that both may be subjected to the same conditions of warmth, light and moisture.

Divide the seeds into parcels, say, ten in each, and select the seeds, so that the weight of each parcel may be the same. Plant all at the same time, and remove one parcel every week in order to determine its dry weight. Plot the dry weights weekly on a chart (see diagram on opposite page).

The seedlings to be examined at one time may be conveniently planted in one box, which should be a foot deep for beans, which have long radicles; handles to the boxes are desirable. It is well that the members of the class should make their own boxes. The garden mould should be sifted thoroughly, so as to make it permeable and of uniform quality; a space should be dug out to receive it. The removal of the seedling from the earth or sawdust requires some care to avoid breakage or partial drying. It is a good plan to empty the box upon a large table, to wash each seedling thoroughly but gently, and after draining to place them in a botanical tin or other closed box.

(37) Compare a plumule of bean with a radicle in the following respects:—

(a) Response to the pull of gravity.

(b) Response to the stimulus of light.

(c) Response to difference in humidity of air.

(38) The pupils who have made the foregoing experiments may be invited to solve the following practical problems:—

Place beneath a bean seedling, fixed as in 28, a plate pierced by a hole big enough to give easy passage to the radicle. Place the hole so that it does not come immediately beneath the tip of the radicle. How can you cause the radicle (without touching it) to pass through the hole?

How can you induce radicles to grow upwards instead of downwards?

How can you induce radicles to leave the earth and enter the air?

How can you get radicles with dense or with sparse root-hairs at pleasure?

How can you raise from a bean a very tall seedling with small leaves of the normal colour? How can you (without touching the seedling, directly or indirectly, and without interposing any visible obstacle) check its upward growth at a particular level, or at a particular time?

THE COMMITTEE STAGE OF THE EDUCATION BILL.

Now that an Autumn Session has been decided upon, there is little doubt that the Education Bill, 1902, will, before the end of the year, become the Education Act, 1902. But, judging from the alterations which have, up to the present, taken place in the early clauses of the Bill, there will be a marked difference between the Act and the Bill in its original form. To appreciate most easily the amount of work already accomplished in committee, it will be convenient briefly to compare, in their original and final forms, the clauses which have been disposed of.

CLAUSE I.—LOCAL EDUCATION AUTHORITIES.

As was indicated in our July issue, the result of the first four sittings of the Committee was the adoption of Clause I. as it originally stood in the Bill, viz. —

(1) For the purposes of this Act the council of every county and of every county borough shall be the local education authority. Provided that the council of a borough with a population of over ten thousand, or of an urban district with a population of over twenty thousand, shall, as respects that

borough or district, be the local education authority for the purpose of Part III. of this Act, and for that purpose, as respects that borough or district, the expression "local education authority" means the council of that borough or district.

Part II.—Higher Education.

CLAUSE II.—POWER TO AID HIGHER EDUCATION.

Before the debate on Clause II. of the Bill, Mr. Balfour announced that the Government had decided to increase the amount of State aid for elementary education. In the course of his speech, the leader of the House explained that the special aid grant under the Voluntary Schools Act, 1897, and the special grants under the Necessitous School Boards Act of the same year, were to be withdrawn, thus setting free some £860,000, to which is to be added a new Exchequer grant of £900,000, making an available total of £1,760,000 for distribution in the form of a new aid grant. This total amount is to be allocated in the following manner: (a) by distributing 4s. to every educational authority in the country per child in average attendance in the schools for which the authority is responsible; and (b) one penny per scholar will be given out of the Exchequer for every 2d. by which the product of a penny rate falls short of 10s.

The debate on Clause II. occupied the sittings on two days, with the result that the clause was much modified, as will be seen by comparing the following:—

As it originally stood.—The local education authority may supply or aid the supply of education other than elementary, and for that purpose may apply the residue under section one of the Local Taxation (Customs and Excise) Act, 1890, including any balance thereof which may be unexpended at the end of the financial year, and may spend such further sums as they think fit: Provided that the amount raised under this Act shall not exceed the amount which would be produced by a rate of *twopence* in the pound, or such higher rate as the Local Government Board may fix by Provisional Order made as respects any particular county or county borough on the application of the council of that county or county borough.

In its amended form.—The local education authority shall consider the needs, and take such steps as seem to them desirable, after consultation with the Board of Education, to supply or aid the supply of education other than elementary (including the training of teachers and the general co-ordination of all forms of education), and for that purpose shall apply all or so much as they deem necessary of the residue under Section 1 of the Local Taxation (Customs and Excise) Act 1890, and shall carry forward for the like purpose any balance thereof which may remain unexpended, and may spend such other sums as they think fit: Provided that the amount raised by the council of a county for the purpose in any year out of rates under this Act shall not exceed the amount which would be produced by a rate of *twopence* in the pound, or such higher rate as the County Council with the consent of the Local Government Board may fix.

It is thus seen that the changes in Clause II. include the abolition of the *twopenny* rate limit in county boroughs, the obligatory instead of the optional application of the "whisky" money to higher education, the declaration that the local authority *shall*, instead of that it *may*, take action in the matter of the provision of secondary education, and the specific mention of the training of teachers as part of its duty.

CLAUSE III.—CONCURRENT POWERS OF SMALLER BOROUGHS AND URBAN DISTRICTS.

Clause III. originally read: The council of any non-county borough or urban district, who have power to adopt or have adopted Part III. of this Act, shall have power, concurrently

with the County Council, to spend such sums as they think fit for the purpose of supplying or aiding the supply of education other than elementary: Provided that the amount raised by the council for the purpose in any year out of rates under this Act shall not exceed the amount which may be produced by a rate of *one penny* in the pound.

In its amended form the Clause is the same except that the words "who have power to adopt or have adopted Part III. of this Act" are omitted. By this alteration to Clause III. the number of local authorities for higher education is increased to 1,183, as compared with the 330 or so of the Bill as it stood before.

CLAUSE IV.—RELIGIOUS INSTRUCTION.

Clause IV. as it originally stood is the same as in its amended form without the sentences from "or any religious catechism" down to "hostel so provided."

As amended in Committee.—(1) A council, in the application of money under this Part of this Act, shall not require that any particular form of religious instruction or worship, or any religious catechism or formulary which is distinctive of any particular denomination, shall or shall not be taught, used, or practised in any school or college aided but not provided by the council, and no pupil shall be excluded from or placed in an inferior position in any school, college, or hostel provided by the council on the ground of religious belief, and no catechism or formulary, distinctive of any particular religious denomination, shall be taught or used in any school, college, or hostel so provided.

(2) In a school or college receiving a grant from, or maintained by, a council under this Part of this Act,

(a) A scholar attending as a day or evening scholar shall not be required, as a condition of being admitted into or remaining in the school or college, to attend or abstain from attending any Sunday school, place of religious worship, religious observance, or instruction in religious subjects in the school or college or elsewhere; and

(b) The times for religious worship or for any lesson on a religious subject shall be conveniently arranged for the purpose of allowing the withdrawal of any such scholar therefrom.

Part III.—Elementary Education.

CLAUSE V.—PART III. TO APPLY WHERE ADOPTED.

Clause V., which read as follows, has been struck out of the Bill:—

"The following sections of this Part of this Act shall apply only within the area of a local education authority for which it is adopted, and a local education authority may adopt it for their area by a resolution of that authority. The provisions contained in the first schedule of this Act shall have effect with respect to the resolution of adoption."

The result is the complete and simultaneous, and not the gradual abolition of school boards, with the exception, at present, of that of London.

CLAUSE VI.—POWERS AND DUTIES AS TO ELEMENTARY EDUCATION.

After discussion, Clause VI. was adopted without modification. The clause reads as follows:—The local education authority shall, throughout their area, have the power and duties of a school board and school-attendance committee under the Elementary Education Acts 1870 to 1900, and the control of all secular instruction in public elementary schools, whether provided by them or not, and school boards and school attendance committees shall be abolished in that area.

ITEMS OF INTEREST.

GENERAL.

THE new Regulations for the Matriculation Examination of the University of London have been received by teachers with mixed feelings, but there is one matter connected with the examination which should give great satisfaction. We refer to the appointment of a number of experienced teachers as examiners for Matriculation. Hitherto there has been a great gulf fixed between examiners for the University and teachers in secondary schools, and the pupil has been a kind of shuttlecock to be tossed from one side to the other by the battledores of the two sides in this educational game. The chief objection to examiners of the old type is that their standard of mental capacity is wrong, with the result that their papers are often open to severe criticism when judged by practical teachers. "General Elementary Science" might have been made a valuable instrument in education if the examiners had used it rightly, but they missed their opportunity. The examiners in what may be termed General Elementary English should show by their papers that all they expect from candidates is evidence of a working knowledge of English. We look forward with interest to the papers which will be set by the new examiners under the new Regulations.

AMONG the new examiners appointed for the Matriculation examinations of September, 1902, and June, 1903, we notice the following:—Latin, Dr. James Gow and Mr. W. C. Summers. Greek, Mr. T. W. Allen and Mr. E. S. Thompson. English, Prof. John Lawrence and Mr. Arthur Reynolds. French, Prof. Brandin and Mr. E. Janau. German, Prof. A. W. Schüddekopf and Mr. Francis Storr. Ancient History, Mr. J. K. Fotheringham and Mr. W. E. Jordan. Modern History, Mr. A. F. Pollard and Prof. J. K. Laughton. Mathematics, Mr. W. D. Eggar and Mr. G. B. Mathews, F.R.S. Physics, Dr. A. H. Fison and Mr. D. Rintoul. Chemistry, Mr. H. B. Baker, F.R.S., and Dr. G. S. Turpin. Botany, Mr. H. Richardson and Mr. V. H. Blackman. Zoology, Dr. G. Herbert Fowler and Mr. O. Latter (for June only). Geography, Mr. G. G. Chisholm and Prof. W. W. Watts. Geometrical and Mechanical Drawing, Mr. Walter Hewson and Mr. H. G. Christ.

WE believe there has been some unavoidable leniency in the examination of the internal candidates at the recent Intermediate Examinations at London University. This was unavoidable, for an examining body cannot be turned into a teaching one in a day. But we believe that in all cases in the future the Internal Examination will attain as high, if not a higher standard than the External. It will be arranged that the papers worked by the Internal students are submitted to the External examiner for approval; and that the answers of the successful candidates will also be supervised by him. It would be quite contrary to the traditions of the University if students of ampler means or opportunities were enabled to escape the high standard which has hitherto been kept up and has made the reputation of the London degrees.

A SCHOOL of Modern Languages has been founded in the University of Birmingham. The course of instruction in the "school" will extend over three years, and will be of an advanced and comprehensive character, including lectures not only on the philology and literature of modern languages, but also on the history and institutions of foreign nations and on the methods of modern-language teaching. Only students who

have obtained a first class in the Intermediate Examination in French, German, Latin, English, Mathematics or Logic, will be allowed to enter the school with a view to graduation in it. Candidates for the School of Modern Languages may, however, take the Intermediate Examination at entrance to the University in lieu of the Matriculation Examination. A special Intermediate Examination will be held for this purpose in September, 1902. After completing their course of study and passing two examinations (one at the end of the first year and another at the end of the third, this latter being equal in standard to the ordinary M.A. examination), students of the "school" may be admitted to the degree of "Bachelor of Arts in the School of Modern Languages," and after one year of further study in this, or a foreign university, they may be admitted to the degree of "Master of Arts in the School of Modern Languages" on presentation of a thesis. The main purpose of the "school" is to train teachers of modern languages for English secondary schools. Several valuable scholarships have been given by Mr. and Mrs. Charles Harding to further the objects of the new school. Four scholarships of the annual value of £50 each, tenable by students of German during three years in the School of Modern Languages, may be awarded, two in 1902 and two in 1903. At the close of the third year, travelling scholarships of £100 each, tenable at a German university for one year, may be awarded to these scholars, provided that they have taken the B.A. degree in the Birmingham School of Modern Languages.

THE annual exhibition of specimens of work executed by pupils in schools of all kinds under the London School Board, held at the Examination Hall on the Thames Embankment at the end of last month, was very successful. The varied nature of the exhibits, ranging as they did from simple brushwork exercises done by infants to elaborate examples of metal work sent by adult pupils in evening continuation schools, or to instances of skilled cooking from the cookery centres, constituted an effective object lesson as to the wide extent of the work the London School Board has accomplished in the education of artisan Londoners. The work shown from schools for the deaf, the blind, and the mentally defective, brought into high relief the humanitarian nature of much of the Board's activity, while the exhibits from the day industrial and the truant schools were evidence enough that successful efforts are being made to improve the children who are unsatisfactory morally. A particularly interesting feature of the exhibition was the fact that classes could be seen at work. The enthusiasm of the children showed convincingly that the teachers have solved the problem of maintaining good discipline and at the same time exciting the liveliest interest in the pupils.

ONE department of the recent exhibition of the London School Board deserves a separate reference. The exhibits of scientific apparatus of a simple kind made by teachers and pupils were a great improvement on those shown at the special exhibition in November last. This is partly to be explained by the fact that the work of this year is a second attempt. We are glad to be able to report that increased attention has been given to several branches of physics that were almost ignored last time; but, if the exhibition is a safe guide, there is still too little attention given to what is now called Nature Study. The opportunities town children of the poorer classes have of becoming acquainted with the beauty of natural objects is necessarily so limited that, unless they are introduced to familiar plant and animal forms in the school, and led to understand some of the wonders of nature by means of simple lessons from a sympathetic teacher, a valuable refining influence, ready to hand and of easy application, is being lost. We have again to

regret that the work of the teachers and scholars was indiscriminately mixed, to the consequent bewilderment of the visitor. But, on the whole, the pieces of apparatus shown indicated that the science instruction under the Board is given in accordance with modern ideas and is of a thoroughly practical nature.

As a preliminary to the Nature Study Exhibition now being held at the Botanic Gardens, an exhibition was held towards the end of June at the Hartley College, Southampton, of the work done by teachers and scholars in the secondary and primary schools of Hampshire and the Isle of Wight. As those of our readers who have seen the selection from the exhibits then on view, which forms part of the London Exhibition, can imagine, there was abundant evidence that the teachers of these districts are fully alive to the value of rational science teaching in the education of children of all ages. A conference held in connection with the exhibition, at which papers by several educational authorities were read, gave the teachers of the locality an opportunity of comparing their methods with those employed in other districts.

THE Board of Education have approved the appointment by the Teachers' Registration Council of Mr. G. W. Rundall as their Registrar. Mr. G. W. Rundall, who is an M.A. of New College, Oxford, was a master at Marlborough from 1877 to 1891, and headmaster of the High School, Newcastle-under-Lyme, Staffs., from 1891 to 1900. He is a member of the Headmasters' Conference, and of the Incorporated Association of Headmasters, and Chairman of the West Midland Divisional Committee of that association. He is also a member of the Political Committee and of the Educational and Library Committee of the Teachers' Guild. During the past year Mr. Rundall has been an Occasional Inspector of Secondary Schools for the Board of Education. He has also acted as an Examiner for the Oxford and Cambridge Joint Board and for the Civil Service Commission.

ANNOUNCEMENT has been made by the Teachers' Registration Council that applicants for admission to Column B of the Register of Teachers, instituted by the Order in Council of March 6th, 1902, may obtain the necessary forms from the Registrar (Mr. G. W. Rundall), 49 and 50, Parliament Street, London, S.W. Before filling up the forms, applicants are recommended to study the precise terms of the Order, which is to be obtained, price 1½d., from Messrs. Eyre and Spottiswoode, Harding Street, Fleet Street, E.C. The headmaster or headmistress of a recognised school who has held office for not less than one year may be put upon Column B of the register at any time during the three years following March 6th, 1902, without further qualification. The authorities of any school desiring to obtain official recognition for it should submit an application for registration on behalf of one or more of its teachers who appear to fulfil the requirements of the Order. The difficulties involved in determining the *status* of certain classes of teachers are so great that the work of registration must inevitably be slow to begin with.

THE holiday courses at the University of Jena, which are open to both ladies and gentlemen, will be held this year from the 4th to the 23rd of August. The subjects to be taken up are divided into five classes, viz.: science; pedagogy; history, theology, and philosophy; art; and languages. All inquiries should be directed to Frau Dr. Schnetger, 2, Gartenstrasse, Jena, from whom detailed programmes of the courses can be obtained.

At the recent annual conference of the Incorporated Asso-

ciation of Headmistresses of Public Secondary Schools the following resolutions were passed:—"This conference welcomes the Education Bill, 1902, as constituting a single local authority, and trusts that every means will be taken to render it capable of dealing adequately with forms of education other than elementary within the areas of counties or county boroughs." "While noting with satisfaction the opinion expressed by the First Lord of the Treasury, that women would not be ineligible as members of the local education authorities, the Association of Headmistresses urges that definite provision should be made by statute for the inclusion of women on the education committees of the local education authorities."

THE second annual conference of the teachers in Government Schools in the Transvaal and Orange River Colony began on July 2nd at Johannesburg, and lasted ten days. Mr. Sargant, the Director of Education, succeeded in bringing together over 700 teachers from all parts of the new colonies, and by an appeal to the generosity of the inhabitants of Johannesburg was able not only to provide the visitors with lectures and discussions, but to offer them hospitality and to secure a liberal supply of entertainments for their leisure hours. At the opening meeting, Mr. Sargant outlined the scheme of educational development which it is proposed to pursue, and laid stress on the decision of the Administration that separate schools were to be provided for coloured children, who, he said, had as much right as the children of other taxpayers to efficient education from the Government. These separate schools will, consequently, be just as well equipped as those provided for other sections of the community. Among the lectures provided, those on astronomy by Sir D. Gill, the Astronomer-Royal of the Cape, and those by Major-General Baden-Powell on the cultivation of habits of observation, deserve special mention.

THE late Sir Thomas Storey presented the Storey Institute of Science and Art to the Corporation of Lancaster to commemorate the completion of the fiftieth year of the reign of Queen Victoria. The Institute has done a great deal to foster the study of art, science, and technology in Lancaster, but in recent years its work has been much hampered by the want of accommodation for the large number of students who have presented themselves. We are glad to learn that Mr. Herbert L. Storey has made a magnificent Coronation gift of £10,000 to the Corporation of Lancaster for the purpose of erecting, on a site adjoining the Institute, a technical school in harmony with the present buildings. It would be difficult to think of a more suitable Coronation gift than that selected by Mr. Storey, and we are hopeful that many of the wealthy men in the large towns throughout the country will follow the excellent example which has been offered them at Lancaster.

As a rule, science teachers are prepared to take part in any movement or meeting having for its object the extension or improvement of scientific instruction. Evidence of this interest in educational progress, in so far as it concerns science, is afforded by the success of the conferences of science teachers which have been referred to from time to time in these columns. The eagerness with which teachers receive suggestions for conferences and the activity with which they give their support is a gratifying sign of the times. A meeting was recently held at Manchester, upon the invitation of Mr. J. H. Reynolds, Principal of the Municipal School of Technology, to consider arrangements for an annual conference of science teachers and others in the North of England. The meeting was attended by leading representatives of primary, secondary (including technical) and other forms of higher education, and resolutions were adopted in favour of holding annual conferences of science teachers during the Christmas vacation.

THE first Conference of Science Teachers in the North of England will be held at Manchester on January 2nd and 3rd, 1903, and subsequent Conferences will be held in other cities. The subjects to be considered at the various sessions of the Conference will be: (1) The curriculum in different types of schools, showing the proportionate time which should be allotted respectively to Mathematics and Science on the one hand, and to literary and other subjects on the other; (2) The co-ordination and delimitation of science teaching in various grades of schools; (3) The methods of teaching Experimental Science (Physics and Chemistry) in its early stages; (4) The methods of Nature Study. With a view to effective discussion, all papers to be printed for circulation to the members during the session, and copies to be supplied to the openers of discussions prior to the Conference. So far as possible, and where desirable, arrangements are to be made for an exhibition of apparatus in connection with each subject of discussion.

THE novel experiment of keeping dogs at school has now been in progress at Clayesmore School (the work of which was described in THE SCHOOL WORLD for June, 1900) for five years, and the result has been altogether good. The value of the kennels is found to lie partly in the fact that dogs provide an interest for leisure hours, for those odd times of the day when the boy has nothing particular to do—periods (as every schoolmaster will attest) that cause the greatest anxiety and often present a serious problem. It has been found that the care of dogs is a sound means of moral discipline to a youth, while thoroughly agreeable to boyish inclinations. Everyone knows how dearly the English boy likes to keep a dog; and under proper supervision the possession of such a pet tends to make him kind to all animals, while it also enables him to enjoy the open air, and in the most natural manner to learn a great deal of the common laws of nature and the ways of animal life.

MUCH care has evidently been expended in the preparation of the descriptive list of books suitable for Army Examinations issued by the Kensington Coaching College. There are now so many excellent text-books available in almost every subject that it is almost impossible to find time to examine them all, with the view of obtaining the most suitable for any special purpose. A classified list such as that before us is a great help to teachers.

WE are glad to see in No. 3 of *The Nature Study Journal* a timely letter from Prof. Miall pointing out the futility (in most cases) of plant collecting, and the harm caused to the native flora by its indiscriminate practice. For nature study "nothing is better than the practical study of common plants which can be raised whenever required and in any quantity."

WITH reference to the notice of the little book entitled "Amigos y Auxiliares del Hombre," in our July issue, we are informed that the book is a translation of one which, under the title of "Friends and Helpers," has long made Miss S. J. Eddy popular in American schools. Unfortunately, no mention of this fact is made upon the title page. The Spanish edition of the book was produced mainly as a Reader for Porto Rico, Cuba, and the Philippines. At the same time it was felt that it would be useful for the increasing number of students of Spanish, as the language which next to English will take a student over a greater territory than any other.

THE tenth annual report of the Liverpool Technical Instruction Committee, which has reached us, is particularly interesting reading. The most important fact reported in coa-

nection with the secondary schools in receipt of grants from the Committee during the past year is the inspection of the schools by the Board of Education at the request of the Committee and with the consent of the Governing Bodies of the schools. The reports of the Board of Education bear ample testimony to the excellent work being done in the schools. The defects pointed out are such as have arisen mainly from inadequate income. To remedy these shortcomings more money must, the report points out, be provided from some source or other, and the matter is engaging the earnest consideration of the Committee and the school authorities. In connection with the commercial classes subsidised by the Committee, a scheme has been formulated for the establishment of afternoon classes in modern languages. French, German and Spanish are being taught to 219 students who are all engaged in business, and, to quote the report, "it is gratifying to find the regularity and continuity of the attendance has been maintained at a very high level, a considerable proportion of the students attending four or five times a week."

SCOTTISH.

THE Scottish Education Estimates in the House of Commons gave rise to one of the most interesting debates of recent years. A clear and comprehensive review of the progress of education during the past year was given by the Lord Advocate in opening the discussion. Its range, however, was soon greatly extended by the succeeding speakers, who preferred to deal with the possibilities of the future rather than with the achievements of the past. The large additional grants that are to go to England under the new Education Bill will necessitate an equivalent grant for Scottish education, and how best to expend this money was the problem members set themselves to solve. It was a case of *Quot homines tot sententiae*, as each one had his own panacea for the educational situation. The Lord Advocate, in reply, though speaking with reservation, gave a forecast of a bill for next session which would deal not only with secondary education but with the whole educational system of Scotland. As the debate very clearly showed, Lord Balfour will have no easy task in drafting a measure which will satisfy everyone. If the bill is to deal with all branches of education, it must follow the lines of the English measure, and Mr. Bryce has in advance warned the Government against applying to Scotland the principles of the English Bill. But neither he nor any of the other hostile critics has suggested a workable alternative scheme.

THE papers set at the Leaving Certificate Examinations this year have maintained the high standard of excellence that has characterised them for some years past. In practically all the subjects the mental capacity of the pupils for whom the papers are intended has been fairly gauged, and the questions set are drawn up on the soundest educational principles, demanding not only knowledge but intelligence at every stage. As a consequence the examinations have now secured the confidence and respect of the teaching profession to an extent that was entirely wanting in the early years. The literature questions in the Lower Grade English paper must be excluded from this favourable criticism. The Department very rightly insists that a knowledge of literature is only of value when it has been acquired at first hand and not from text-books. Yet year by year questions on literature appear which are a test of nothing save text-book knowledge. Last year in French the pupils were asked to give an account of Rabelais' great work, and this year the junior pupils in English are expected to know something of Jeremy Taylor and Hooker and their works. It is questions like these, and the necessity some teachers feel of teaching down to them, that has brought the whole teaching of literature into disrepute.

THE West of Scotland Association of Secondary Teachers in Public Schools have forwarded the following resolutions to the Education Department:—(1) That the Association approve generally of the provisions for the Leaving Certificate, and regard with special satisfaction the restriction of the term "Leaving Certificate" to mark the close of a full course of secondary education. (2) That the provision whereby "where two or more languages are taken one of them must be Latin" will have a most prejudicial effect upon the teaching of modern languages and will shut out from the benefit of the certificate a large class (especially of girls) who wish to take a full course of secondary education on the line of modern languages rather than of science or classics. (3) That a group be instituted in the Leaving Certificate proper, placing modern languages on the same footing as classics and science. (4) That the Association cordially approves of the institution of a Commercial Certificate, and specially welcomes the provision to delay to a later period in school life instruction in special subjects.

IN his report for the year 1901, Mr. Scougal, H.M. Chief Inspector for the Western Division of Scotland, states that there is room for more careful attention to distinctness of articulation and to at least approximate correctness of pronunciation in the schools of his district. The defects peculiar to these schools, and more especially to those in Glasgow, are detailed at length, but all districts have certain peculiarities of pronunciation which it should be the duty of the schools to combat and, if possible, eradicate. Mr. Scougal states that there are schools even in the poorer districts which show what can be accomplished in the way of correct pronunciation when due pains have been taken. He finds that one of the difficulties in the way of improvement is that many teachers regard the defects as incurable, while others have not trained themselves even to recognise such defects. *Quis custodiet custodes?*

IRISH.

A TRIBUTE to the new Intermediate system was paid at the annual prize distribution at St. Columba's College, Rathfarnham, where it was stated that, in consequence of the reforms, it was proposed to introduce it in the school so far as the curriculum allowed.

THE temporary inspectors of the Intermediate Board finished their year's work on June 1st. Their reports are confidential, but an abstract of them will be published and sent to heads of schools. The time has now come for the Board to appoint permanent inspectors. There is a very strong feeling that the temporary inspectors should not be permanently appointed, the schools being by no means satisfied that they are the best possible men. This is one of the questions on which some interchange of views personally between teachers and a consultative committee would have been of immense advantage.

THE Convent Schools Committee have unanimously passed resolutions that in the Intermediate Programme it is not desirable that mathematics should be compulsory for girls in the higher grades, but that arithmetic should be made a separate subject in every grade; that the option of English (now History and Geography) instead of Experimental Science (or girls in all grades ought to be continued; that in girls' schools instrumental music and needlework should be subjects, and should be tested by examination in the school; that domestic economy should be made practical, and should include cookery.

AT the annual meeting of the Teachers' Guild in London the following resolution was proposed by the Chairman of the Irish Branch, and unanimously carried:—"That it be an instruction to the Central Council when promoting educational legislation

to take into consideration the needs of Ireland with a view either to their being met in English Bills or to the passing of separate measures." This represents the strong feeling of the Irish Branch that an undeserved injustice is being inflicted on Irish education by the limitation of registration to England.

THE June examination papers of the Intermediate Board, which were looked forward to somewhat anxiously as being the first under the new system, have on the whole given general satisfaction. The only papers to which exception can fairly be taken were those in Greek, which, besides containing serious misprints, were too difficult both in themselves and as compared with those in other subjects. In some subjects the papers were perhaps too easy, but this is a fault on the right side when the object is not to fail the candidates, but to encourage them. A good deal of adverse criticism has been passed on the English papers, but in our opinion with very little justification.

THE Catholic Headmasters' Association recently passed resolutions that the Intermediate Examinations should in no year conclude later than July 1st (this in consequence of a report that the Board desire to postpone the examinations till the end of July), that the Association was in favour of an independent University for Catholics, and that it was desirable that students who for the first time next year may join secondary schools in which the First Year's Science Course has been taught during the session 1901-2 should be allowed to enter at once upon the Second Year's Course. The Department, in reply to this, regret that they will be unable to pay grants in respect of pupils who take the course in Introductory Chemistry, and have not completed the work of the first year in Introductory Physics.

THERE being some doubt as to whether the Treasury grant for Technical Instruction in Ireland will be continued after the present year, the Roman Catholic Archbishops and Bishops at their general meeting at Maynooth appear justified in passing the following resolution:—"Since the Agricultural and Technical Instruction Act (1899) provides only £55,000 a year for technical instruction in Ireland, whilst England receives from public funds close upon £1,000,000, we protest against the action of the Treasury in withholding or limiting in any way the grant hitherto offered to all local authorities levying a local rate for such instruction. We do so the more because the sum of £55,000 comes mainly from Irish funds; moreover, the Councils of counties and county boroughs have levied rates on the faith of a promise that an equivalent sum would be given by the Treasury, whilst, if the grant be withheld, no part of the country will derive any advantage for technical education from the Act of 1899."

IN answer to the request unanimously agreed upon by the various associations of teachers, that the Intermediate Board and the Department of Agriculture and Technical Instruction should form a consultative committee to confer with representatives of schools in respect to changes in their rules and programme, the Intermediate Board have decided, after careful consideration, in the negative. In reply, they state that they cannot undertake the responsibility of establishing such a committee, but that all representations coming to the Board from a responsible source will always have full attention. They further add that "the Board are accustomed to set about the preparation of their Programme early in the month of November in each year, and that it would be therefore desirable that any recommendations that are to be submitted to the Board should be received not later than November 1st in each year." The Department, on the other hand, are favourable to the suggestion, and are willing to establish a consultative com-

mittee on the lines suggested, being anxious to be in touch with the schools. This is good so far as it goes, but the dual government of the schools is not an ideal arrangement, and the work of the Department, however important, can only form a small portion of school work. There can be no doubt that the absence of personal contact between the Intermediate Board and the schools has led to many mistakes in the past which might have been obviated, and the Board would have been well advised in adopting the suggestion.

WELSH.

THE University of Wales (Graduates) Bill has been before the Standing Committee of the House of Lords, presided over by Lord Cross, and has passed without any alteration, and therefore is ready for the stage of the third reading.

WALES has now a share in Mr. Carnegie's generosity. Mr. Carnegie has stated his willingness to furnish £6,000 for library buildings for Merthyr Tydfil—on condition of provision of sites and that the libraries be not a burden on the library revenue under the Act—so that the "whole of the revenue resulting from the maximum assessment shall be devoted to the purchase of books and general upkeep of the libraries." Mr. Carnegie adds that he is induced to give this sum because of his indebtedness to the Welsh element in America. "The Welsh are," he says, "a great people." He brackets them with Scotsmen.

PROBABLY it is not generally known that, to enter upon the courses for the B.D. degree in the University of Wales, it is a "condition precedent" that the candidate shall have taken a degree in Arts. Of course, in theological colleges, it is likely that there will be students who have not graduated in Arts, and will not do so—at any rate, within the time of residence at college—so as to be able to go on continuously as students in theology, after graduating in Arts. But it is not inappropriate that Wales, which has produced so many theologians and preachers, should be anxious to demand in its University a particularly high standard in this subject. With a largely increasing number of graduates amongst the laity, it will in the future be clearly desirable that the leaders of religious thought should have a broad training as well as theological scholarship.

AT the University College of North Wales at Bangor recently, there has been given by Mr. George Rae a sum of £1,500 to be the nucleus of a sum to be raised for the endowment of a Chair in Economics, with special reference to banking and finance. Sir Alfred L. Jones, of Liverpool, has given to the University of Wales no less than twelve scholarships of £30 a year each. Of these, five he has allotted to Bangor, five to Aberystwyth, and two to Cardiff. The scholarships are restricted to Welsh students. The Senate of the Bangor College have decided to award two of these scholarships this year, one as an in-College award on the result of last year's work—and one—a most significant departure—as a scholarship for a student in training as a teacher in a secondary school. At Bangor also, the Tate Trustees have given £1,000 to continue the Tate Exhibitions in scientific and technical work. Also, there is announced the prospect of £2,500 to establish similar scholarships in memory of the late Sir G. Osborne Morgan.

AT the annual meeting of the Governors under the Cardiff scheme of the Welsh Intermediate Education Act, a letter was read from the local Association of the Assistant-masters in

Secondary Schools asking that the Governors should give grants to enable masters of modern languages to visit the continent for the purpose of perfecting themselves in pronunciation. Nothing came of the request at the moment; but if Governors choose teachers of modern languages who cannot speak the language which they have to teach, it might not be badly invested money, if there is any that could legally be given for the purpose, to spend it in this way. Indeed, it would probably lead to unsuspected stimulation of teachers in secondary schools if other teachers, besides language teachers, could receive grants to enable them to see the methods of teaching their subjects employed in foreign schools.

THE Technical Instruction Committee of the Glamorganshire County Council has inquired into the likelihood of good candidates being forthcoming if they instituted a scholarship for students wishing to graduate in Music in the University of Wales. Such a scholarship, if established, would be founded in connection with the University College of South Wales at Cardiff. The Committee say: "It is full time for us in Wales to attempt to produce not only vocalists, but also scientific musicians who will elevate the standard of musical education throughout the whole country, and who will enable Wales to take its proper place not only in the world of song, but also in musical composition and orchestration." It is reported that for a Musical Scholarship offered by the Carmarthenshire County Council nineteen candidates entered, and that of these five were declared by the examiner of sufficient merit for special mention. With these examples before them, other counties in Wales are pretty certain to consider the desirability of instituting similar Musical Scholarships.

CURRENT HISTORY.

THE Parliament of Cape Colony is to resume its sittings. This is perhaps the most momentous question recently decided by our Government. But is it peace? Hostilities in the field have come to an end, but what will happen among the various parties in Cape Town? Loyalists, Africanders, Dutch, all are greatly agitated by the recent war, and none of them feel that the sword can by any possibility be regarded as having said the last word. The institution called "Parliament," regarded by our fathers as the panacea for all evils, looks too much like a risky experiment to try in South Africa. And recent experiences elsewhere do not help us to feel confidence in its peace-making qualities. Let Austria-Hungary speak, or some of our New World Colonies. Meanwhile, our thoughts go back to early Stuart times, and we begin to understand, in the light of current events, that James I. and Charles I. may not have been altogether in the wrong when they said they had tried Parliaments and found them wanting. They blundered in governing without Parliaments because, unlike their Tudor predecessors, they neglected to consult public opinion otherwise.

A DECREE of the Emperor William II. has called our attention recently once more to Elsass-Lothringen, and reminded those of us who are old enough to remember it of the wonderful war of 1870-1. That war was practically over in a month, occupying just the period of our summer holidays. What followed was a gallant attempt at the impossible, to build up French armies and make them efficient before the German armies, already efficient, should have completed their work of capturing Paris. The Prussian statesmen were asked, "Against whom are you fighting?" And the answer was, "Against Louis XIV." It was the revenge of an at last united Germany for the losses inflicted upon the Empire in its chaotic condition of the 17th

and 18th centuries by the "Grand Monarque" and his successors. It is an interesting, though complicated story—the gradual acquisition of Elsass and Lorraine by France between 1540 and 1792. But the question as to the control of the course of the Rhine is older than Louis XIV. or the Reformation. It began, indeed, when the partition of 843 first marked out roughly the frontiers of modern France and Germany and left between them that long strip which, under the name of the Middle Kingdom, included the Netherlands, Switzerland, and North Italy. And now Elsass-Lothringen is once more entirely German: it is the possession of the German Empire, and its inhabitants are, according to the recent decree, to be governed as loyal German citizens, no longer subject to temporary dictatorships.

THE Margrave of Brandenburg has been visiting the kingdom of Prussia; in other words, the Prussian King and German Emperor has been to Marienburg to assist in the restoration of the chapel of the Order of Teutonic Knights. He at least still believes in the old cause of that famous order. Only now the enemy seems to be Poland and Poles instead of heathen Wends. It is an interesting story, the Germanisation and christening of the old Wendish Prussians, illustrating in many ways the modes of thought and action that governed the men of the Middle Ages, and that have so passed away that it needs much reading and wide sympathy even to understand them in these "Romeless" days. But we may spare a word to indicate the connection between "Prussia" in the original sense of the word and the Hohenzollern family. Albert of Hohenzollern was Grand Master of the Teutonic Knights at the time of "the Reformation." The order had fallen on evil days, and was in many ways subject to the then powerful kingdom of Poland. So Albert turned Protestant; that is, he dissolved the order and made himself ruler of their territory under the title of Duke of Prussia. His eldest grand-daughter carried the Duchy as a dowry to her cousin of Brandenburg, and when nearly a hundred years later the Emperor Leopold wanted Hohenzollern help in the war of the Spanish succession, it was sold to him on the payment (beforehand) of the title "King in Prussia." The latter story would carry us too far.

EVERY now and then we are coming across the phrase "Zollverein or Customs-Union" in our newspapers, and it is said that some of our statesmen are wanting to introduce into the working of the British Empire this thing without any name but a foreign one that wants translating. And when we enquire why this thing is wanted and why it has no satisfactory English name, we find answers which set us thinking. We learn from our histories that, in the first half of the last century, Germany was regulated by the Congress of Vienna and was divided, much against the wish of many German patriots, into some forty monarchies of various kinds and sizes. Austria was the predominant partner in this loose confederation, and her rival Prussia, unable to contend with her on terms of equality, set to work in a very humble way making commercial treaties with her neighbours, and forming a Toll-union ("Zollverein") to knit them together on the basis of the abolition of "frontiers" as far as commerce was concerned. On this humble foundation was built the structure which triumphed afterwards at Sedan. Is, then, the British Empire, for which we are told a Zollverein is also desirable, in the condition of Germany in 1830-40? Is it only a loose federation which requires knitting together by commercial ties mutually inclusive of its parts and carefully exclusive of the enemy? Is the tie so loose that it is necessary to tax ourselves indirectly, by means of a protective tariff round the Empire, and wall ourselves in like China? Or is this Zollverein the price the British Isles must pay, like Prussia in 1830-40, in order to win the Colonies to her side?

RECENT SCHOOL BOOKS AND APPARATUS.

Modern Languages.

Paul Heysse, L'Arrabbiata. Edited by Dr. W. Bernhardt. iv.+76 pp. (Heath.) 1s. 3d.—The *Novellen* of Paul Heysse are no food for babes and sucklings, and to produce an edition of any of them for school purposes seems singularly perverse. On this account alone we cannot recommend the book. Those who are fit to enjoy this little work of consummate art will not need the rather flat notes and the vocabulary which the editor has supplied.

H. A. Guerber. Marie-Louise et le Duc de Reichstadt. Edited by the Author. iv.+101 pp. (Heath.) 1s. 3d.—We cannot help regarding it as a mistake to choose Marie-Louise for a heroine—there are so few redeeming features in her character. We should consider the book as little likely to interest boys, and we should certainly refuse to read it with girls. Though written in simple and fluent French, it cannot rank as literature. The attempt “to repeat, as frequently as possible, the most common idioms, conjunctions, and adverbial expressions” is in itself commendable, and Miss Guerber might have produced a useful little book if only she had chosen some more suitable subject. To some of the renderings in the notes we must take exception; thus we should not tolerate “dinner galore” nor “she feels badly” nor “a mature being” (for *un homme fait*).

Edited Books.

The Age of Chaucer. By F. J. Snell, M.A. With an Introduction by Professor Hales. 242 + xlviii. pp. (Bell.) 3s. 6d.—Messrs. Bell's useful and cheap series of *Hand-books of English Literature* are by this time very widely recognised, although hitherto no opportunity has been vouchsafed to us to speak as highly of them as they deserve. Inasmuch, however, as they betray a happy tendency to run into edition after edition, it may be hoped that some of the volumes which have already made this series notable may yet receive a tribute of praise in these pages. Mr. Snell's present volume on “the Age of Chaucer” is an excellent piece of workmanship, not only for its positive features, but because, when a writer is severely limited by the conditions of his work, what he excludes from discussion is often as significant of his powers as the remainder which he condenses. And this little monograph may lay fair claim to be regarded as complete, acute, stimulating, and scholarly. The half century or so with which it deals has already been dealt with on its historical side by Mr. Snell in another volume, but the literary value of this account is unquestionable, and as a presentment of a series of literary portraits subsidiary in interest perhaps to Chaucer, but full of importance, e.g., Langland, Wycliffe and Gower, to mention no others, it is worthy of great attention. Indeed, as concerning Gower, it is difficult to recall any recent account of him which is more attractive. Naturally the *Miracle Play* occupies a very considerable portion of the author's space, and Mr. Snell's account of it is rather remarkable for the way in which it puts information which is already common property than for any originality concerning this topic of perennial interest. He does, however, suggest several lines for further research if anything may come forth of that; and his statement that the salary of players in some of these extraordinary productions ranged from fourteen pence to four shillings a day is as startling as it is pleasing. Concerning Chaucer himself, one only wonders why Mr. Snell

should have felt it necessary to make even the shadow of an apology to “social purists” for the trade of a vintner, which in the occupation to two successful fathers brought to light two such men of genius as Chaucer and Ruskin. If by social purists Mr. Snell means the weaker brethren, surely their trivial tyranny has endured long enough! We would respectfully suggest that the spelling “vassel” on p. 141 is an error. The style of this monograph is as delightful as the matter is learned. It is emphatically a book to read, if only for the delicious subconscious humour of passages like this:—“The result is that Chaucer performs an unexpected somersault, dedicated his poem, not humorously, to the ‘moral Gower’ and ‘philosophical Strode,’ and closes with a translation of Dante's ‘invocation of the Trinity.’”

Poems of English Country Life. Selected and edited by H. K. George and W. H. Hadow. 112 pp. (Clarendon Press.) 2s.—There is nothing included in this charming volume which is not well known to every fairly-equipped student of English literature, but the compiling of such a book is a distinctly happy conception, and it has been most successfully executed. Perhaps its greatest service will be to display accurately and vividly the trifling proportion which nature poetry bears to the whole body of English literature. It was inevitable that there should be a great deal of Wordsworth in this collection; but he cannot be said to be over-represented. Curiously, however, neither Crabbe nor Shenstone supply any illustrations, in spite of the fact that Crabbe's muse dwelt in the country persistently, though, perhaps, less in commerce with inanimate than with human nature.

Selections from De Quincey. By Milton Haight Turk, Ph.D. 501 pp. (Ginn.) 4s. 6d.—The introductory matter of this edition is really well worth attention, and the notes are numerous, clear, and in some cases extremely valuable. The text has been selected with great judgment, and includes many unfamiliar things as well as those universally known pieces with which the name of De Quincey is for ever associated. The whole selection makes a useful addition to educational literature, and if its use tends to encourage a taste for De Quincey which should contribute to discouraging the prevalent taste for Macaulay, great good might come of it. The secret of De Quincey's style is worth untold gold to him who can master it, whereas with Macaulay, style was sometimes a vice and sometimes an affectation.

The School Anthology. Edited by J. H. Lobban. Parts I. and II. 259 pp. and 291 pp. (Blackwood.) 2s. each.—The division of English poetry in these two volumes is made by including in the first the period between Chaucer and Burns, and by commencing the second with Wordsworth and concluding it with Mr. Henry Newbolt. The selection is throughout admirable, and these two volumes represent a kind of quintessence of many well-known anthologies of more pretentious reputation; but, although from the title given to them it might be thought that only purely educational interests could be served by them, they are of sufficient value to justify their inclusion in the library of all lovers of English literature. We cordially commend them to schoolmasters and schoolmistresses, as much for their own reading as for their pupils' use.

A Study in the Symbolism of the Divina Commedia. By Eleanor F. Jourdain. 76 pp. (The Norland Press.) 2s. net.—Useful to Dante students and Dante lovers. It cannot be called exhaustive or critical in the higher literary sense of the word, but as a contribution to the lighter literature which has gathered about the work of the great Florentine poet it is undoubtedly interesting. So far as purely English readers go, it might have been rendered more serviceable had at least a prose translation been offered at the foot of the pages wherein the Italian poetry

is embedded. Dante in the original tongue is still an impossibility to many people who would with a translation derive great advantage from Miss Jourdain's popular style of writing about him.

Drift of Isla. By William Gow. 72 pp. (Elliot Stock.) 2s. 6d.—The author of these poems informs his readers that many of them have "a Scottish flavour about them," and, moreover, that "they express the essential elements of human experience whether humble or lofty, grave or gay, and in them the reader will find that happy blending of humour with seriousness and that peculiar irony which have come to be regarded as distinctly Scottish." When an author tells his readers what they are to find in his verses, the trade of a poor reviewer is at an end. We commend Dr. Gow to the public; or to *his* public—which is, perhaps, a different thing.

Lyra Scriptorum. By J. A. Nicklin. 42 pp. (Black.) 8d.—This booklet combines some poems which are old favourites with most readers of religious poetry with others not so well known. Mr. Nicklin declares his own intention to have been the providing of "a kind of humble pendant to Mr. Henley's 'Lyra Heroica.'" It is not an extravagant ambition, but it has been only moderately realised in these pages, which, however, contain much that is interesting; notably, a selection from Walt Whitman—who would have been very much surprised had he ever seen it in such a connection.

The Globe Poetry Reader for Advanced Classes. 190 pp. (Macmillan.) 1s. 4d.—This is a continuation of a scheme favourably noticed in these columns recently, and as a selection of fine poetry, ancient and modern, it is deserving of high praise. Much that is included is thoroughly well known, but many unfamiliar authors are likewise drawn upon, and Sir Francis Hastings Doyle, Professor Palgrave, Henry Newbolt, Alfred Austin, and Austin Dobson are by this means introduced to the notice of schoolboys and schoolgirls, who will be none the worse for making their acquaintance.

The Hebrew Monarchy. By the Rev. A. R. Whithan. 292 pp. (Rivingtons.) 2s. 6d.—An uncommonly useful volume for those teachers who find little time for disinterring the actual current history of Israel from the state of apparent confusion in which it exists in the Bible records. This matter is dealt with in thirty-one lessons covering the period from the birth of Samuel to the accession of Solomon. The general scheme of this series is followed in detail, and all the characteristics of this volume are excellent.

Shakespeare's Richard III. By L. W. Lyde. 160 pp. (Black.) 1s.—Another of Mr. Lyde's successful attempts to show what that usually shadowy personage, a "general editor," can do when he condescends to particulars. We have before noted that the only distinguishing merit of this series is a kind of moderate usefulness for ordinary class-work; and this volume maintains the character already earned. It is well, but not strikingly done; and the scope of the scheme of the series is too small.

Supplement to A Midsummer Night's Dream. By Stanley Wood. (Dinglewood Shakespeare Manuals.) 24 pp. (Heywood.) 6d.—Mr. Stanley Wood has taken to answering his own well-known series of questions for the benefit of the scholastic public. It is an interesting exhibition, and it must be said that the answers are as scholarly and full as the questions are ingenious. It would be a pity, however, if this well-meant effort should promote other people's laziness.

Macaulay's Essay on Chatham. By Rev. H. W. Dennis. 167 pp. (Longmans.) 1s. 6d.—An edition containing much

serviceable teaching material, and no little evidence of care and scholarship, but most remarkable for the illustrations which diversify the text. The notes are excellent; and so once upon a time was Macaulay; but we have frequently said of late that Macaulay as a stylist was a temporary and not an eternal blessing. This volume confirms one's conviction.

Burke's Thoughts on the Cause of the Present Discontents. By F. G. Selby, M.A. 172 pp. (Macmillan.) 2s. 6d.—A very serviceable edition of a most notable work, which might, however, have been improved if the account of Burke in the introduction had been made a little more interesting. There is plenty of everything else in it, but little of Burke. The notes are good.

Milton's Lycidas. By II. B. Cotterill. 112 pp. (Blackie.) 1s. 6d.—Sixty-four pages of introduction and thirty of closely-printed notes to a Miltonic text of one hundred and ninety-three lines will strike any observer with a sense of disproportion in a school edition; but there it all is; and it must be said that Mr. Cotterill has managed his task with painstaking accuracy. The two appendices are really valuable.

Richard the Second. 186 pp. (Blackie.) 1s.—Despite its title, the illustrative element in this volume is not large, though it is fairly good of its kind. The literary matter is not remarkable. Except for the novelty of the thing, it is difficult to see what particular service this addition to the myriad editions of Skakespeare can be.

King Lear. By D. Nichol Smith. 174 pp. (Blackie.) 1s. 6d.—This volume follows the general lines which in this series of editions are now well known. The historical and literary matter supplied by the editor is good; the "Critical Appreciation" is readable though not remarkable; the notes are rather poor; but Appendix A is worth attention.

Emerson's Essay on Beauty. By Susan Cunnington. 87 pp. (The Norland Press.) 1s. 6d.—An able attempt to deal with a new subject in a promising and valuable way. It cannot fail to stimulate deeper thought and to promote clearer literary and philosophical insight than the majority of school editions. The "Subjects for Thought" at the end are splendid.

Waverley. By E. E. Smith. 198 pp. (Black.) 1s.—This useful series is becoming quite substantial in point of the number of volumes it contains. The process of selecting the matter has been carefully managed, and the notes are clear, and not at all a burdensome addition to the text.

Milton's English Sonnets. By E. H. Blakeney. (English Classics.) 40 pp. (Blackie.) 2d.—A very useful edition, compact and condensed with an array of notes worth much attention. Strikingly well done under the conditions.

History.

An Introduction to British History. iv. + 200 pp. (Blackie.) 1s. 2d.—This Reader (for we suppose it is intended to be such) takes subjects from ancient British times to the present day. It has a summary and illustrations, some of which are good, others are in gaudy colours. It shows no signs that its author has read anything for the last thirty years of what has served to illustrate our earlier history, and apparently nothing but fighting has happened in our history for the last two hundred years which can interest children.

Social Life in England. (Vol. I. From Saxon times to 1603.) By J. Finnemore. xi. + 258 pp. (Black.) 1s. 6d.—This is an excellent little book, brightly written, and with seventy-eight

good illustrations. Thirty-three of its pages are taken from Sir Walter Scott's novels of "Ivanhoe" and "Kenilworth." The only fault we have to find is that Mr. Finnemore is not acquainted apparently with some of the latest information on feudal times, and is therefore out of date about the manor and its antecedents. Otherwise, we can heartily recommend this book as one in which its young readers will delight.

Problems and Exercises in English History. (Book D, 1715-1820.) By J. S. Lindsey. (Cambridge: Hefter & Sons.) 2s. net.—Mr. Lindsey is rapidly progressing in his task of covering the whole course of English history by means of a series of typical questions and model answers. We reviewed the second book of the series last March; this is the third. Mr. Lindsey's wide information and his skill in classifying and stating facts are evident on every page. Some of the answers provide outlines and summaries valuable not only to examinees, but even to historical lecturers and teachers. For example, not many students of the period under review would be able to enumerate nine separate attempts to invade the British Isles during its course. Yet Mr. Lindsey tabulates the nine attempts on one of his pages, and a very valuable study in comparisons and contrasts the list provides. As one glances through the questions dealt with in this work one perceives that it is capable of doing a great service to the teacher or scholar who cannot afford time to wander far from the confines of his text-book. It provides him with numberless new points of view: it abstracts salient features of all kinds: it shows him how to organise his own information, and how to state it in examination form. We think, however, that Mr. Lindsey would have been well advised both to simplify and to shorten his series. What with "Set X" and "Set Y"; what with "Book G" covering the period 1688-1832 and "Book D" following it on the period 1715-1820; what with question 974 following immediately on question 861, question 471 succeeding question 746, and so on *ad infinitum*; the whole scheme becomes as complicated as a Chinese puzzle.

A First History of England. By C. L. Thomson. Part III. 1272-1485. xii. + 283 pp. (Horace Marshall.) 2s.—We have already welcomed and recommended to our readers the first two parts of Miss Thomson's history. The third part continues the good qualities of its predecessors. The story is well told in simple language inspired at first hand by the mediæval writers, and the illustrations are almost uniformly good and of greatly varying interest. We can imagine no better introduction to the main story of English history. But with the advance into the more complicated events of the Plantagenets the difficulty arises of constitutional history, both lay and ecclesiastical. And Miss Thomson seems to us to have fallen into some of the usual misrepresentations. Thus, although she knows (p. 46) that "until 1322 it had not been recognised that the Commons must always sit in Parliament," she allows herself to say (pp. 19, 20) that "since 1295 every regular Parliament has consisted of Clergy, Barons and Commons." On page 26, she "proves" the "illegality" of Edward I.'s taxation in 1295 by saying, "it had been expressly forbidden in the Great Charter," though articles 12 and 14 had been omitted in the re-issue of 1216, and had never been restored. And this ante-dating of checks on royal authority is further illustrated by the allusion to "the rights and privileges that had been so painfully gained" before the reign of Richard II. (p. 108), coupled with the account of elementary privileges gained first (p. 152) in the reign of Henry IV. In ecclesiastical matters, too, we note the use of the phrase "anti-church" where "anti-clerical" is meant, and of the phrase "Church of Rome" instead of the "Catholic Church." We have been so pleased with Miss Thomson's work on the whole that we offer these criticisms with a view to future editions, and to the continuations which we hope to see.

Messrs. E. J. Arnold and Son, of Leeds, have sent us copies of a new series of cartoons to illustrate British history. They are designed by Mr. W. S. Stacey and are printed in colours, care being taken to make them carefully correct in dress and other details. Each picture is about a yard square, and the series is apparently intended to number about eighty. The pictures may be had mounted or otherwise, prices varying accordingly. The name chosen for the series is *The A. L. History Pictures*. From the half-dozen copies before us, we should judge they would be useful and effective decorations of the schoolroom. Care must, of course, be taken in their use, otherwise the more thoughtful children will either puzzle the teacher with awkward questions or carry away false impressions. Pictures must maintain the dramatic unities, and therefore anachronisms will arise. It is highly improbable, *e.g.*, that such a group of ancient Britons as is represented in No. 1 ever met as they are there represented. Each individual is correct, but the whole is misleading unless explained. Similarly in No. 50, Indians were not actually present at the moment of the landing of the Pilgrim Fathers, yet their dealings with the exiles sufficiently warrant their inclusion in the pictures. In No. 40 we fancy the experienced sailor would find something to criticise. The Spanish ships ought by their relative positions to be taking the wind from some of them, yet their sails are all full, and the English ship in the foreground is in imminent peril of being run down. Even Elizabethan sailors did not run such risks as are here represented. But such difficulties are probably inevitable in picture-history, and this series promises to be a welcome addition to our schoolroom decorations.

We have also received from the same publishers *The "A.L." Genealogical History Chart*, by L. Williams (42 in. x 35 in.) price 5s. net. There are portraits of all the Kings from Egbert downwards (how many of these, we wonder, are mere fancy?) arranged in a circle surrounding genealogical tables, and two maps, one of "Saxon Times," the other of the British Empire of to-day. Mr. Williams in Queensland may think his tables are on a new plan. We have seen such things in England long before this, down even to the device of colouring the various houses differently and making the Tudor parti-coloured. Still the chart is effective and not displeasing in appearance.

Geography.

America. The Illustrated Continental Geography Readers. 176 pp. + 16 maps. (Blackie.) 1s. 6d.—This book is quite up to the general standard of merit possessed by the three preceding members of the series previously reviewed in this column. It provides interesting reading for schoolboys, and the information given is generally accurate and up-to-date. The most unsatisfactory feature of the book is the poorness of the relief maps.

Object Lessons in Geography. By Vincent T. Murché, F.R.G.S. xvi. + 334 pp. (Macmillan.) 3s. 6d.—The teacher who carefully follows the directions given in each lesson will have no difficulty in making his geography lessons not only interesting but disciplinary as well. The book is suitable for use in the lowest forms. It commences with the child's personal observations of out-of-door phenomena, and from these he proceeds in an orderly manner to the study of the broader geographical principles which they exemplify on a small scale. "The falling rain, the gutter streams, and roadside pools eventually become his natural teachers." This is as it should be and we cordially recommend the book. There are one or two "Lessons" that are not quite satisfactory: *e.g.*, a desert is not necessarily a sandy waste (p. 219), and we think a distinction should be made between a water-parting and a watershed.

Science and Technology.

Domestic Economy for Scholarship and Certificate Students. By Ethel R. Lush. viii. + 251 pp. (Macmillan.) 2s. 6d.—This little book was compiled to meet the requirements of students for the King's Scholarship Examination and the Certificate Examination of the Board of Education, but the chapters on Cookery, Household Management, Accidents and the Treatment of the Sick will appeal to a wider circle of readers. In the part dealing with the chemistry of food and digestion we notice some errors and looseness of expression, and the drawings of starch grains in Figs. 3, 4 and 5 are quite misleading. The remaining illustrations—76 in number—are excellent.

The Imperial Health Manual. Edited by Antony Roche. 2nd edition. xv. + 304 pp. (Baillière, Tindall & Cox.) 3s. net.—This is the authorised English edition of the "Official Health Manual" issued by the Imperial Health Department of Germany. It covers a wide field, and will be useful as a book of reference in elementary general hygiene and preventive medicine. The phraseology is occasionally vague, and some terms are so literally translated as to be scarcely recognisable by the average reader. For "elastic band," e.g., we find "gum string," and for "tubular," "reed-formed."

Object Lessons for Rural Schools: Senior. By Vincent T. Murché, F.R.G.S. xxiv. + 306 pp. (Macmillan.) 2s. 6d.—This contains substantially the matter of a book noticed last month (p. 276) arranged in the form of object lessons. It may be confidently recommended to rural teachers. A section at the end gives additional information, in a concise form, on the common trees and wild flowers, and shows how a nature calendar should be drawn up and the events filled in by the scholars.

Nature Note-Book. By W. L. Boys-Smith. (Allman.) 6d.—This unpretentious little book will be found very useful. The letterpress (13 pp.) specifies various observations to be made by the student; it is divided into botanical, zoological and physiographical sections. A list of questions set in the examinations of the National Froebel Union "to test observation" is also given. The rest of the book consists of blank paper for notes and sketches.

A College Text-Book of Chemistry. By Ira Remsen. xx. + 689 pp. (Macmillan.) 8s. 6d.—Professor Remsen is well known to teachers of chemistry in this country as the author of several books on chemical subjects. His "Elements of Chemistry," which was first printed in England in 1887, was largely instrumental in popularising the "research" method of teaching which is now generally adopted in our best schools. It is unnecessary, therefore, to say very much about the clearness of Professor Remsen's style of exposition and the simplicity of his explanations, for teachers of chemistry are familiar with these characteristics already. The book before us is intended to fill a place between the author's "Introduction to the Study of Chemistry" and his larger text-book on inorganic chemistry. Chemical theory and the treatment of the non-metals take up some 426 pages of the book, the metallic elements are described in about 220 pages, and the remaining part of the volume is given to certain familiar carbon compounds. Prof. Remsen departs from his usual practice of interspersing the experiments and the ordinary text, and collects the practical exercises in batches at the ends of the chapters. In view of the large number of really good manuals of chemistry already on the market, we are a little doubtful as to the need for a new book, excellent as we find it to be.

Insect Life: Souvenirs of a Naturalist. By J.-H. Fabre, D. ès Sc. Translated by the author of "Mademoiselle Mori." With a preface by David Sharp, M.A., F.R.S., and edited by F. Merrifield. xii. + 320 pp. (Macmillan.) 6s.—Fabre's *Souvenirs Entomologiques* are among the most fascinating contributions to the literature of natural history, and this translation of the first series allows the English reader to enjoy their vivacity and charm. Fabre's French—as Mr. Sharp points out in the preface—is difficult to translate adequately, but it must be admitted that the present version is very successful. Only here and there does a little quaintness of expression remind one that the work is a translation, and these few instances are not unpleasing. In this volume the author restricts himself almost entirely to accounts of his personal observations of the remarkable instincts of Hymenoptera. It would be difficult to find anything in fiction surpassing the interest of Fabre's description of the relentless piracy and artistic assassination in vogue among certain insects of this group. The chapter entitled "Three Strokes of a Dagger" is an admirable example of his style. The volume contains 16 beautiful plates by Mr. M. Prendergast Parker, and is attractively printed and bound. We hope its success will be such as to induce the publishers to produce the remaining series. An index would have added to the value of the book.

Mathematics.

Solutions of the Problems and Theorems in Smith and Bryant's Geometry. By Charles Smith, M.A. 230 pp. (Macmillan.) 8s. 6d.—A concise key, without figures, which will doubtless be acceptable to teachers. "Solutions of Theorems," by the by, is a curious expression; and the use of || for "parallel" instead of "is parallel to" is rather objectionable, as it tends to encourage = for "equal."

The Tweeddale Arithmetics. Book VI. 132 pp. (Oliver and Boyd.) 8d.—This book is intended to meet the requirements of candidates for the Merit Certificate, and appears likely to serve its purpose well enough. At the end of the volume is a collection of Merit examination papers, and a fair number of exercises in mental arithmetic.

First Stage Mathematics. Edited by W. Briggs, LL.D., M.A., F.C.S., F.R.A.S. viii. + 186 pp. (W. B. Clive.) 2s.—This contains the Euclid and algebra required for the South Kensington elementary stage. The Euclid is satisfactory enough, the algebra is not. For example: "Suppose $+2 \times -3$ or $-2 \times +3$. Evidently the product will not be the same in either of these cases as in $+2 \times +3$. Therefore we assume that $+2 \times -3 = -6$, and $-2 \times +3 = -6$ Again, suppose -2×-3 . This is different from the last two cases, and we assume that $-2 \times -3 = +6$." "In grammar, if we remove either the subject or predicate from a sentence, we destroy the sentence. So, too, in algebra, if we remove either the symbols or the operations from a sum, we destroy the sum." But it is not all so bad as this, and the chapters on equations are really helpful. At the end of the book are the First Stage arithmetic papers for the years 1882-1901.

Drawing.

Freehand Drawing of Foliage, &c. By John Carroll. (Burns & Oates.) iii. + 24 pp. 1s. 6d.—It is impossible to insist too strongly upon the value—to art student and nature student alike—of the drawing of plant forms. The twenty-four reproductions here given of photographs from nature are accompanied by useful analytical diagrams, which indicate the best method of treating each example. The subjects are of graduated difficulty, and the book, as a whole, may be confidently recommended.

Blackie's South Kensington Drawing Cards (Coloured). Set V., Ornament (Advanced), 1s. 6d.; Set VI., Plant Forms, 1s. 6d. (Blackie & Son.)—Even the conventional and wearisome "free-hand copies" over which we yawned at school became interesting when we were allowed to paint them. The twenty copies in each of these series will afford good practice in laying on flat washes of colour, but the colouring of some cards of Set VI. might with advantage have been more natural. Most of the designs are above the average of such publications, some of those in Set V. being copied from friezes, &c., in the Victoria and Albert Museum.

Philips' Free Brush Drawing Copy Books Applied to Pattern. By Stanley Thorogood, A.R.C.A. Books I., II., and III., 3d. each net.—It is a pity that so clever a draughtsman as Mr. Thorogood should not have taken the pains to provide better elementary brush-work examples than these. Some of the early examples are quite clumsy, and are moreover wanting in the precision which is essential in drawings intended to be imitated by young students. It is only in Book III. that the copies rise to anything like a high level.

Macmillan's Free Brush Design Drawing Cards. By Francis N. Wallis. In three sets: Junior, Intermediate, and Senior. 2s. each Set.—Set I. of these cards is the best series of brush-work copies that we have seen for a long time. The examples are well chosen, well drawn, and sufficiently interesting, and the various stages for setting out the designs are clearly shown. It is a pity that Sets II. and III. do not quite fulfil the promise of their predecessor. They are, it is true, more complicated than the junior set, but they are neither so graceful nor so interesting.

Philips' Primary Drawing Cards. By F. F. Lydon. Standards I. to VI. 1s. 6d. each net.—Are apparently the outcome of the circular on Primary Drawing issued by the Board of Education, and provide copies for practice with both a flexible and a firm point. It is not easy, from the selection of cards sent us, to trace any very methodical progress in the difficulty of the examples, and many of the more advanced illustrations are not well enough drawn. Why, for example, teach a child to draw a horse which could with difficulty be made to stand, and to perpetrate lettering which is absolutely ugly?

The Bases of Design. By Walter Crane. 381 pp. (Bell.) 6s. net.—We are glad to see a new edition of Mr. Crane's well-known work at a price which puts it within the reach of a much larger circle of readers than could profit by it before. The book is founded on lectures addressed to students of the Manchester Municipal School of Art while Mr. Crane was director of that institution, and is abundantly and admirably illustrated by photographic reproductions of old and modern work and by line drawings by the author. Mr. Crane divides his subject into ten chapters dealing respectively with the architectural basis, the utility basis and influence, the influence of material and method, of conditions, the climatic influence, the racial influence, the symbolic influence, the graphic influence, the individual influence, the collective influence; an arrangement which of itself shows that he assumes too much general artistic knowledge for his book to be fit for a class-book in primary or ordinary secondary schools. The volume contains, however, much information, notably about methods and processes, which would be very useful to teachers in such schools, and interesting to older pupils. It is, in short, a book which should certainly find a place on the shelves of every good school-library.

CORRESPONDENCE.

The Editors do not hold themselves responsible for the opinions expressed in letters which appear in these columns. As a rule, a letter criticising any article or review printed in THE SCHOOL WORLD will be submitted to the contributor before publication, so that the criticism and reply may appear together.

The Union of Educational Associations.

No one who has the best interests of his country at heart can afford to disregard the numerous educational conferences and meetings of teachers which are held annually. The unprofessional onlooker is filled with admiration for the enthusiasm of the men and women who, though jaded and weary with the fatiguing duties of term-time, yet give up a generous proportion of their leisure hours to discuss educational problems and to endeavour to effect the advancement of the co-ordination of education. Many citizens who, like myself, possess a layman's interest in all problems affecting the education of the country read and try to understand the discussions reported more or less fully in the newspapers from time to time. But it is difficult to understand, and it is with a view to enlightenment that I venture to address you, why so many associations of teachers in secondary schools are in existence. There appear to be a Headmasters' Conference, together with Associations of Headmasters, Headmistresses, Assistant-masters, Assistant-mistresses, Modern Language Teachers, Science Masters in Public Schools, Principals of Private Schools, Headmasters of Preparatory Schools, and probably others which have not come under my notice. And all these enterprising associations are concerned only with secondary education; another long list could be made of societies consisting of teachers in elementary schools.

To an outsider like myself this condition of things seems to afford an excellent example of dissipation of energy. Surely it may be postulated that the chief object of each of the associations named is the improvement of education. Compared with so lofty an aim, particular class interests appear to the uninitiated as being of quite minor importance. It is not surprising that practical politicians are apt to dispose of the resolutions of these separate societies as merely private expressions of opinion and in no sense representing the deliberate and carefully formulated views of the imposing army of teachers in secondary schools. Clearly very much is lost by the multiplication of small, select coteries each with its own particular, but nationally insignificant, object to forward. Is there anything to gain? Is there no educationist with a position so exalted that he may with general acceptance adopt the *role* of the old man who collected his sons and spoke the parable, the interpretation of which was: "United, we stand; divided, we fall"?

Are the interests of a headmaster so unlike those of his colleagues who assist him that they may not belong to the same society? Imagine the same principle applied to our learned societies; there would be a chemical society for professors and another for demonstrators. But, fortunately for the advance of chemical science, broader counsels have prevailed. The professor and his demonstrator meet on an equal footing as chemists, yet one hears nothing of insubordination in the laboratory. Why cannot a headmaster and his assistants, a headmistress and her colleagues, all meet on an equal footing as educationists?

Does it not seem like giving the enemy—and there are enemies of education—cause for scoffing that many of the headmasters of secondary schools in this country are eligible for membership of the Incorporated Association of Headmasters but not of the Headmasters' Conference? And why among educationists must the ladies deliberate apart from the men?

The fact is, teachers in secondary schools, with their multiplication of individual interests, are quite exceptional. It is time that the names "head" and "assistant," "schoolmaster" and "schoolmistress," were merged in what should be the honourable title of "teacher."

R. H. RENFORD.

"Phaeacians" and "Suitors of Penelope."

YOUR Reviewer of my "Sancta Paula" has thrown doubts upon my "scholarship" because on page 83 of the book, Toxotius calls the young Roman nobles *Phaeacians*. In doing so he only quoted Horace, who calls the degenerate Roman youths of his own day "suitors of Penelope," and *Parasites of Alcinous, K. of the Phaeacians*. It is customary to call all self-indulgent, unwarlike young men "*Phaeacians*," and the passage has been entirely misunderstood by your Reviewer, and cannot be taken as a mark of want of scholarship.

WALTER COPLAND PERRY.

Athenæum Club.

I AM glad to learn that Mr. Perry did not mean to identify the "Phaeacians" and the "Sponsi Penelopes," as he certainly seems to do in the following passage of his book (p. 83):—

"Especially great was the throng of young nobles—the "Phæacians," as Toxotius called them :

Sponsi Penelopes, nebulones, Alcinoique,
In cute curanda plus aequo operata juvenus.
(Suitors of Penelope, parasites of Alcinous,
Who spend too much time in caring for their skins.)"

Mr. Perry's punctuation and translation of this familiar quotation seem to me to bear the construction which I put upon it ; but I shall be pleased to apologise for my "misunderstanding" if any classical scholar accepts his version as correct and free from ambiguity. I should like to add that I did not go so far as to accuse Mr. Perry of "want of scholarship": my exact words were, "sometimes, e.g. . . . we have our doubts as to whether Mr. Perry's scholarship equals his enthusiasm." That was a general impression which led me to qualify my favourable opinion of the book. Writing a short notice, I could of course not go into detail, and so confined myself to giving two salient instances.

YOUR REVIEWER.

The Society of Arts French Examination.

IN past years you have noted the unsatisfactory papers set in French at the Society of Arts Examinations. As there has recently been a revision of the syllabus, it was thought the style of the papers would be altered, but the one set last April was quite of the bad old type. The examiner still appears to think that there was a golden age of English prose which should still be copied, as French writers imitate the writers of their own classic age. For him our golden age was the eighteenth century ; so he gives pieces of Johnson, Goldsmith, Sterne and Burke to be translated into French. This year it was Goldsmith's turn, and the extract from "The Vicar of Wakefield" contains many words and phrases used in a different sense from the modern one. To expect a candidate to translate a piece of English first into modern English and then into twentieth-century French in the short time allowed is unfair, and does not so much test his knowledge of French as of eighteenth-century English—a most excellent thing, but not necessary in a commercial examination.

The piece to be translated into English was from Taine's description of Oxford : in it Taine wrote, "de larges cours avec leur jet central d'eau jaillissante" : this the examiner has abbreviated to "de larges cours d'eau jaillissante," thereby quite obscuring the sense.

In the grammar questions, our old friends, the *femines of court-vêtu* and *hébreu* appear. Is there a feminine of *hébreu*? Littré denies that there is; *Adbraigus* is used as its feminine, but it is a quibble to ask for a feminine of such a word. At the top of the paper, it is stated that candidates will be allowed to avail themselves of the concessions specified in the decree of the Minister of Public Instruction relative to the simplification of French syntax. And yet the examiner asks for the plural of compound nouns, despite the Minister's opinion that such rules are unnecessary, and that all compound nouns may be written in one word, and the sign of the plural placed at the end. One of the words asked for was *chèvre-feuille*, spelt with a hyphen. I do not believe there is any authority for spelling it thus. And how often would a clerk need to write the plural of *Te-Deum* in the course of his commercial career?

The Society of Arts has recently tried to make its examinations more useful by having three grades. It has also ceased to advertise its examiners' books by recommending them to candidates in their syllabus. But there is still work for them to do.

DE V. PAYEN-PAYNE.

The Teaching of Elementary Geometry.

THE English notion that Euclid's "Elements of Geometry" is a system of unsurpassable logic and unapproachable as a training for the thinking faculty is dying a particularly hard death. The blows delivered by great Continental philosophers and educationists of a century ago seem to have had very little effect on this side of the Channel, and the present revival of discussion can hardly be expected to be fatal to an opinion so dear to English teachers. However, the adherents of a worn-out system of pedagogy are clearly nearing the "last dyke." Their chief thrust appears to be the charge that the attempts at reform in mathematical teaching, made known so widely by the Glasgow meeting of the British Association, are hasty experiments suddenly hurled into publicity by Professor Perry and prompted by a new spirit of heresy ; and their chief parry the plea that uniformity in the teaching of geometry is essential if we would avoid being landed in a "disastrous muddle" by a "lack of cohesion."

So long ago as 1871 Mr. J. R. Morell, formerly H.M. Inspector of Schools, writing in the *Educational Review* of that date, urged that the Euclidian method was unfit for teaching, that it was not a healthy training for the thinking faculty, and that the time had arrived for a more truly scientific treatment of the subject. Mr. Morell's article can be recommended to all interested in the present discussion, with which it is as up to date as though written yesterday. Kant, Hegel, Herbart, Steinert, might be quoted to show that as a precise method Euclid's is utterly wanting. This, however, is unnecessary. Since the publication of Todhunter's School Edition of the "Elements" in 1862, any schoolboy has been able to point out flaws in the "unsurpassable logic." The definition of angle, the 12th axiom, props. 22, 24, of Book I., 10 of Book III., 32 of Book VI., are a few flagrant examples of particular flaws. Recent editors such as R. C. J. Nixon and H. M. Taylor have endeavoured to remedy these and others, but the principle is that of putting new patches on an old garment ; the general defectiveness of Euclid's method remains, though it is less frequently dwelt upon. A system of logic which requires the proof of nineteen propositions before two sides of a triangle can be shown to be greater than the third, which makes such an obvious and fundamental proposition as its eighth depend on such an involved, indirect and otherwise useless proposition as its seventh, which prescribes nine separate actions in order to draw one line as long as another, and which is then held up as a pattern, is more likely to bring logic into disfavour than to promote its study. The fundamental truths of geometry, instead of growing, like a

genealogical tree, out of the construction of an equilateral triangle, or any other single origin, are in the main independent of one another. To exclude the principle of *a priori* intuition, the methods of scientific induction, and the direct appeal to experience and experiment, is to stifle thought, to stunt mental growth, and to debase the subject to the level of a catechism.

Whether as an introduction to logic or to geometry, "Euclid" is equally unsuited to the needs of modern education. As a work of genius, as a contribution to the growth of geometrical knowledge in the early ages of European development, its fame, as all admit, is imperishable. But fame is no argument against reform. After two thousand years Aristotle was abandoned as a preceptor in natural science. Boyle and Black, Davy and Faraday, cut us adrift for ever from the philosophy of the great Stagyrite, and our youth is not even allowed to waste time in studying it as a mental discipline. In geometry we have been less fortunate. Great mathematicians have left it to others to repeat the cry that the time has arrived for a more truly scientific treatment of the subject, that, after a sway of two thousand years, Euclid must be awarded his place in the Walhalla of the dead. His vaunted followers have long ago forsaken the spirit of their master, for Euclid in his day was a reformer, and what reformer ever held that nothing better could ever supplant what he had done? And he must have no successor. Any attempt to set up one rigid system in place of another is an attempt to damp the educational activity which has been quietly proceeding for many years, and has now received a useful fillip by the British Association. Let the authority which controls the curriculum of a school state in a general way the kinds of geometrical work which it will expect the pupils to do at a considerably advanced stage of their education, but let it leave every teacher to be his own authority upon the methods by which he will educate his pupils up to that stage.

Even in a reactionary age, educators can hardly be coerced into any dead level of uniformity. That is only possible with mere novices or time-servers. Education is a living process and must exhibit variety in every detail. A glance at the elementary chemistry books of the last thirty years will show that there is no uniformity in the methods of teaching chemistry; but our chemists are not thereby at variance, their methods of reasoning yield remarkably uniform results. How can it be held that geometry would suffer by a similar variety of ways of treatment? Yet we hear of a committee having the presumed object of arriving at some sort of uniformity by means of a "judicious omission and readjustment." If this striving after uniformity is to become a shibboleth, it will only afford another occasion for the oft repeated taunt that, as a nation, we are slow to move in educational matters and lag conspicuously behind our neighbours.

It is, however, interesting to note that in at least one quarter of our "Empire," namely, in Wales, substantial progress is being made towards variety. At the recent Festiniog conference of the teachers of science and mathematics in the secondary schools of the principality, Dr. J. J. Findlay, headmaster of Cardiff Intermediate School, gave an account of his method of educating beginners in geometry. By every inductive device and auxiliary experiment he causes the chief geometrical concepts to grow up into the mind of the pupil. This is by no means a mere preliminary introduction soon to be cast aside in favour of the old deductive method. It is the beginning of a complete synthesis of the subject. Dr. Findlay sees no prospect of ever saying to his pupils, "Now, you must begin again, and learn these truths by analysis, and deduce them from the smallest possible number of axioms." What, however, is to be especially noted is that this "educational research work," as Dr. Findlay aptly calls it, is conducted with the approval of the educational

authority in Wales. In the general regulations and examination schedules of the Central Welsh Board there is a definite permissive clause, allowing any headmaster to submit an "alternative scheme" in any subject, and if the Executive Committee of the Board approve of such scheme they will examine the school in accordance with it.

HENRY B. WOODALL.

The County School,
St. Asaph.

Experiments with Dioxide of Sulphur.

EVERY chemistry master is aware of the many points of resemblance between CO_2 and SO_2 . Perhaps it may be news to some to know that magnesium ribbon can be burned in the sulphur dioxide (with separation of sulphur) as easily as in the former. Also I have found strongly ignited phosphorus to be capable of burning in SO_2 —with accompanying sulphur deposit.

H. PERKINS.

School of Science,
Workington.

Proper View of Punishment.

IN a recent number of *The Captain* there appeared a little story, "Pat and the Colonel," illustrating, I think, rather well, one view of punishment. Pat had done a mean thing, and the Colonel punishes him "to restore his self-respect." This seems to me to bring out quite admirably one effect of wise punishment. Pat's remark, "I'm jolly glad you licked me," is also characteristic of the real boy at his best. By making the atonement which is most natural to him the boy feels that he can once more face his own conscience without fear of reproach.

This view may not cover all cases, as punishment, or "stimulus," is sometimes needed purely as an incentive to exertion. In either case, however, it seems to me that punishment loses almost all helpful effect unless there is a genuine voluntary submission. There may be exceptions; but, speaking of average boys under the influence of a good tone, no penalty would, I believe, prove so severe as not admitting the individual to "the privilege of punishment."

Z.

The School World.

A Monthly Magazine of Educational Work and Progress.

EDITORIAL AND PUBLISHING OFFICES,
ST. MARTIN'S STREET, LONDON, W.C.

Contributions and General Correspondence should be sent to the Editors.

Business Letters and Advertisements should be addressed to the Publishers.

THE SCHOOL WORLD is published a few days before the beginning of each month. The price of a single copy is sixpence. Annual subscription, including postage, eight shillings.

The Editors will be glad to consider suitable articles, which, if not accepted, will be returned when the postage is prepaid.

All contributions must be accompanied by the name and address of the author, though not necessarily for publication.

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No. 45.

SEPTEMBER, 1902.

SIXPENCE.

GEOGRAPHY FOR MATRICULATION AT LONDON UNIVERSITY.

THE REVISED REGULATIONS.

By E. R. WETHEY, M.A., F.R.G.S.
Bradford Grammar School.

THE revised regulations for the London University Matriculation Examination, issued in June of this year and applicable to future examinations (except that of January, 1903), effect several remarkable changes in the syllabus, and nowhere in more pronounced fashion than in Geography. Under the old regulations there was practically no geography, for it was little short of farcical to regard as even "involving a knowledge of the most salient facts in general geography" the one or two questions—all of the "memory" type—which were tacked on to the end of a History paper. In the new regulations Geography takes its place as one of the optional subjects with a full three-hours' paper attached to it. True, the compulsory "English" paper still requires a knowledge of the "salient facts" as before, but over and beyond this "*Physical and General Geography*" appears as a separate, and rightly a separate, and distinct subject. And it is no perfunctory syllabus that the University authorities have drawn up. Here it is:—

PHYSICAL AND GENERAL GEOGRAPHY.

The following regions in decreasing detail:—(a) England and Wales, (b) Scotland and Ireland, (c) Europe, the Mediterranean, the North Atlantic, North America and Greenland, (d) the remaining Continents. Recapitulation from the point of view of the British Empire.

Attention should be directed to the following aspects of the several regions:—The broad contrasts and chief features of the land-relief. The chief features of the coastal outline as related to those of the relief. The disposition of the water-partings and of the chief river basins. The winds and sea-currents, distribution of rainfall, the climatic contrasts, and the resulting agricultural contrasts. The districts of exceptionally dense or rare population considered in relation to their position, natural resources, and industrial activities. The arrangement of the political divisions upon the land-relief and with reference to the drainage system. The analysis of the positions of the great towns.

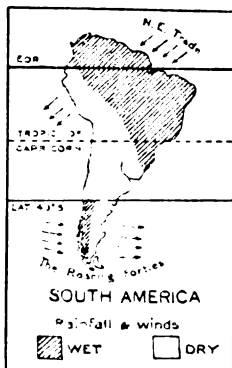
Candidates will be expected to understand the main physical causes of the phenomena they describe, such as variations of atmospheric temperature and pressure, their seasonal and regional distribution; the causes of precipitation, winds—their cause and prevalence in different regions, the interpretation of weather charts, and the meaning of the net-work and other conventional symbols employed in maps. Time need not be spent in elaborate map-drawing. The answers in the examination should be illustrated, where necessary, by simple diagrams, correct in general proportion, but without detail. Candidates may be expected to identify maps without names, to insert upon such maps the position of geographical features, and to work problems as to local time.

We are not concerned with the question whether this is or is not a good syllabus. What we are asked to do is to point out to intending candidates what kind of work the scheme involves, and to suggest some suitable books which will assist them in their labours.

The main thing we glean from the syllabus is that students who take up Matriculation geography in the future will be expected to study the subject in a rational and scientific way. There is to be a truce to the erstwhile lists of capes and islands, mountains and rivers, provinces and towns; the era of why and wherefore, cause and effect, is inaugurated; principles are to be learnt and capacity for applying them to be shown. That is on the supposition that the examiners appointed by the University act up to their syllabus, and there is every reason to suppose that they will. If one thing more than another is becoming apparent in modern geography examinations, it is that there is a strong tendency to keep questions which merely demand memory more and more in their due proportion to questions involving powers of thinking and reasoning, and of applying principles learnt to physical and political phenomena. The old type of question was, "What are the exports of India?" "Name the chief mountains of X." Now we substitute: "India is an agricultural country: show this from its exports, and give reasons." And "Where are the highland regions (not mountains) in X, and what effects have they on the industries of the district?" We have no doubt that in the London University papers both types of questions will be represented, but we are certain—in the face of the new syllabus—that it will be the "rational" and not the "memory" type which will preponderate. To emphasise this

it is only necessary to quote certain portions of the syllabus:—"The chief features of the coastal outline as related to those of relief." Some sort of a "list" may be requisite, but the point lies in the "relation;" e.g., the Yorkshire coast from Flamborough Head to the Humber mouth and its hinterland; the west coast of Scotland, say, from Oban to Skye and its hinterland, with the causes of contrast in the two cases. "The winds and sea-currents, distribution of rainfall, the climatic contrasts, and the resulting agricultural contrasts"—the agricultural contrasts and the causes thereof, say, of the plain of Lombardy and the Austrian Tyrol; of the Pacific coast of North America and the area of the great Basin; of the east and west sides of New Zealand. "The analysis of the positions of the great towns"—whereon the curious may read much to their enlightenment in Mr. Dickinson's able article on the great towns of France in the current number (July) of the *Geographical Teacher*.

Again, "Time need not be spent in elaborate map-drawing. The answers . . . should be illustrated . . . by simple diagrams." Here is sound common-sense. There is absolutely nothing harder—notwithstanding mechanical nostrums and mnemonic systems—than to draw from memory an elaborate, and at the same time good, map. Worse than all—from an examination point of view—it takes such an unconscionably long time! As for diagrams—the more the merrier, and the simpler the better. In a very recent examination we were so struck with the simplicity and lucidity of the diagram-map annexed that we make no apology for reproducing it in *facsimile*. Certainly the author—quite a young boy—will never see this copy of it. The



question bore on "agricultural contrasts and causes," though not in so many words, and the answer contained this sketch map by way of illustration. It is not, of course, given to everyone—even to London Matriculation students—to discourse glibly on "Trades" and "Roaring Forties," but much discourse can be dispensed with if the art of diagram-map drawing is cultivated.

We have said enough to show in what spirit we, at all events, think that Matriculation candidates should go to work under the new regulations. They must get down to principles, cause and

effect, effect and cause, and generally learn to apply their geography lessons.

But the most important part of this article remains. What *books* are there in the market which will show the way?

We have written so far synthetically; we will proceed analytically. Here is a selected list of books, to which we affix published prices, as pockets have to be considered in this matter as well as brains, years of latest issue by way of a guide (not always infallible) to up-to-dateness, and a few comments on the chief characteristics of the books specified. Choose, then, any *one* of the following in each set:—

SET I.—PHYSICAL GEOGRAPHY AND PHYSIOGRAPHY.

Herbertson's "Outlines of Physiography" (Arnold), 1901. 4s. 6d.

The best of the newest books; stiff reading in parts; generally clear, interesting, and well illustrated.

Mill's "Realm of Nature" (Murray), 1897. 5s.

Very interesting and accurate; good coloured maps.

Geikie's "Elementary Physical Geography" (Macmillan), new edition, 1900. 4s. 6d.

Huxley's "Physiography" (Macmillan), new edition, 1900. 6s.

Two "classics" very difficult to beat. Huxley's may be said to combine the synthetic and comparative methods of teaching geography, with the Thames as unit.

SET II.—GENERAL GEOGRAPHY.

Chisholm's "School Geography" (Longmans), new edition, 1900. 3s. 6d.

Invaluable book; most excellent introduction of 60 pp. on physical geography.

Mill's "General Geography" (Macmillan), new edition, 1901. 3s. 6d.

Very trustworthy, as all Mill's works are.

Tarr and McMurry's "Series of Geographies" (Macmillan). 1900-1. 3 vols. [i. General; ii. North America; iii. Europe and other Continents.] 3s. 6d. to 4s. 6d. each.

Plenty of detail, illustrations, maps of all sorts; American point of view.

Mill's "International Geography" (Newnes), 1900. 15s.

Seventy authors, nearly all of whom have lived in the countries which they describe; an invaluable work of reference for a *teacher* of geography.

Meiklejohn's "Comparative Method" (Holden). 27th edition, 1902. 4s. 6d.

To be read with discretion; method and arrangement very good.

SET III.—THE UNITED KINGDOM.

Green's "Short Geography of the British Isles" (Macmillan), latest edition, 1896. 3s. 6d.

Written on true geographical principles.

Herbertson's "Commercial Geography of the British Isles" (Chambers), 1900. 1s.

Causes and consequences from cover to cover.

ON THE BRITISH EMPIRE. Two new books by "Nemo"—"The Making of the British Colonies" (Heywood), 1901, 2s. 6d., and "The Harmony of the Empire" (Heywood), 1901, 5s.—might be read with advantage.

SET IV.—ATLASES.

Philip's "Atlas for Beginners" (Philip), 1901. 2s. 6d.

Title "for beginners" misleading; capital for most examinations, at all events.

Ravenstein's "Systematic Atlas" (Philip), 1895. 15s., and abridged, 10s. 6d.

Large number of inset maps; capable introduction on map projections.

Chisholm's "New Atlas" (Longmans), 1889. 12s. 6d.; and abridged, 1893, 5s.

Clearness personified.

Newnes' "International Student's Atlas" (Newnes), 1902. 6s.

Up-to-date maps by Bartholomew.

Philip's "Atlas of Comparative Geography" (Philip), 1901. 1s. and 1s. 6d. "The London School Atlas" (Arnold), 1901. 1s. 6d.

Two of the newest and best cheap elementary atlases; not over-burdened with names.

We repeat, choose any *one* in each set, and you, sir or madam, who have to enter for the London Matriculation on the basis of an average school geography curriculum, or perchance to teach for the Matriculation on a "chapter ahead" qualification (which may be no fault of your own), will not go far astray. According to this, four books make the minimum; the irreducible minimum would be a book of the Chisholm type (Set II.), and of course an atlas.

We could say much more on this subject of books. There are, of course, others—for we are very far from claiming omniscience in such a matter—as good as those mentioned, though not better for the immediate purpose. Our list may be invidious, but it is not exclusive, and is not meant to be. We have, for instance, made no mention of the "Commercial Geographies" of Chisholm (Longmans, new impression 10s. and 2s. 6d.), of Mill (Pitt Press, 1901, 1s. 6d.), and Adams (Hirschfeld Bros., 1902, 5s.)—all well adapted to the wants of the student who has a bent for "Applied Geography"—nor of the British classics, Geikie's "Scenery of Scotland" (Macmillan, 1901, 2s. 6d.), Ramsay's "Physical Geology and Geography of Great Britain" (Stanford, 6th Ed., 1894, 10s. 6d.), and Hull's "Physical Geology and Geography of Ireland" (Stanford, 1891, 7s.), which are indispensable if one has time to dig deeper into the geographical field; nor of Mackinder's new book, "Britain and the British Seas" (Heinemann, 1902, 7s.), which, given time, will probably become a classic for scientific geography. We think, however, that safety lies above.

But geographical books, it should be remembered, are constantly growing old. Advertisement is rife. It would, perhaps, be as well to suggest certain "tests" for application to any text-book or atlas which a candidate may have a mind to procure. In the first place, then, suspect a book without a date on the title-page; it may be all right. The odds are it is behind the times. Be assured that the date is not suppressed in your interest. Secondly, if it speak of the "Kong mountains" as still existing in Africa, of the Gulf-stream as the great determiner of West European climates, of Devon and Cornwall as still supplying great store of tin and copper to the world; if it spells Indian names with "oo" and "ee" and prints Burmah instead of Burma, Hoang-ho instead of Hwang-ho; if it does not devote proportionate space to the industries of the United States—in a word, if it is not up-to-date, have nought to do with it. Above all, beware of atlases (and text-books, too, for the matter of that) which are not strong on physical features, which print scaleless maps, which are not clear and distinct, which have defective registers, and still show Formosa as belonging to China.

Anyone who desires further information should read Mill's "Hints to Teachers and Students on the choice of Geographical Books for Reference and Reading" (Longmans, 1897, 3s. 6d.), and should take in *The Geographical Teacher*—the organ of the Geographical Association—published by Messrs. Philip and Son three times a year at 1s. a time.

PHYSICAL TRAINING IN SCHOOLS.

By THOMAS CHESTERTON.

Organising Teacher of Physical Exercises for the London School Board.

II.—SWEDISH DRILL AND PHYSICAL EXERCISES.

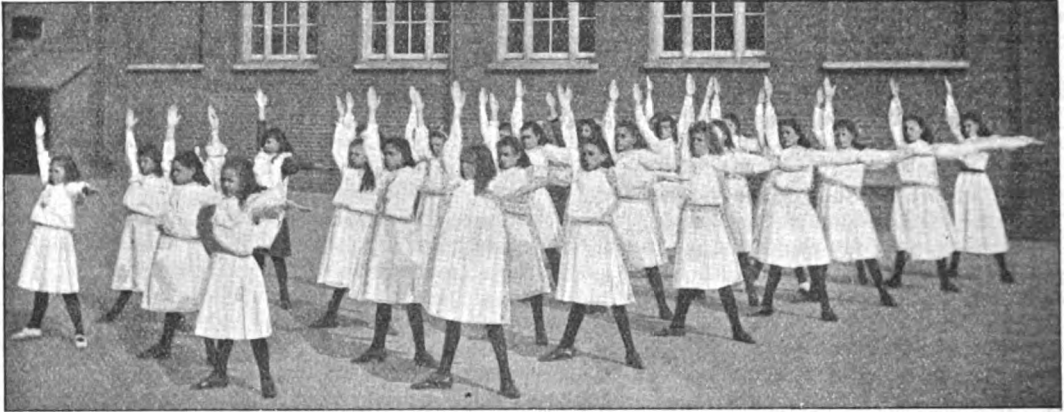
SWEDISH exercises are those evolved from the system introduced into Sweden by Ling in the early part of the nineteenth century. These exercises were originally medical movements, and from them school and military gymnastics were evolved. For a considerable period the Swedes claimed originality for the Ling system in whatever form it was taught; but his later followers admit that the ideas were not new. In fact, they had undoubtedly originated from the works of an English anatomist (1794). Still, to Ling, the Swedes owe the systematisation of the exercises bearing his name, and to him is due the credit of making the work as perfect as possible, and adapting it to the training both of children and adults. Militarism was at the bottom of this system, and it has been altered and improved by Ling's followers from time to time to keep pace with modern physiological and anatomical science. Consequently, it has become so re-constituted as to bear but little resemblance to the form in which it was first presented.

The system of Swedish drill, as known in the schools of this country, is one of free movements only, and it is claimed for this system that it is based strictly on physiological lines, and that the exercises have been chosen for their gymnastic value, those only having been introduced which have been found to produce the best local and general effects. It is also claimed that scope is granted to the teacher in varying the exercises according to the general physique of the pupils. The exercises are calculated to develop the body harmoniously, and to counteract and remedy faulty growth and incorrect posture. The primary aim is to produce beneficial effects on the nervous system, the muscular system being considered of secondary importance. The system rightly discourages spectacular movement, as having little effect on physical development. The movements are admirably progressive, commencing with the most simple, and culminating in vigorous and complicated exercises. This progression is so detailed that the simple movement of each limb or other parts of the body is strictly taken into account. Some authorities on the system totally disapprove of the use of movable apparatus—such as dumb-bells, wands, clubs, etc.—with the exercises, since the value of the exercises is lost by using such.

The exercises, according to the best Swedish authorities, are arranged as follow:—Preparatory movements, foot and leg movements, neck and trunk movements, arm movements, balance movements, shoulder-blade movements, abdominal exercises, lateral trunk movements, marching, running, jumping, and respiratory movements. The foregoing are called free standing movements, although

in the execution of some of them the hands and other parts of the body frequently come in contact with the ground. It is not claimed that the above constitutes a complete course of physical exercises unless access to a gymnasium is allowed. This latter point is strongly advocated; in other words, the exercises should be performed alternately as

that they cannot be arranged musically without sacrificing the physical benefits. It is also contended by some authorities that every movement in the system has a rhythm of its own distinctly apart from music—consequently, no music can be suitable to any series of movements. If music were introduced the children would pay more at-



Swedish Drill and Physical Exercises.—Arm stretching. Bellenden Road Board School, London, S.E.

free movements and with the aid of portable and fixed apparatus. The free movements are all to be taught by word of command, and it is claimed that this is the only way in which the minds of the pupils can be concentrated on the work. This plan ensures the exercise of will-power in all the

attention to it than to the exercises, therefore physical benefit would in a great measure be lost. Still, marking and counting the time are recommended, unless when the movements are of one *tempo*.

The system is a rational one, a reason being given for everything in it; theory and practice go



Swedish Drill and Physical Exercises.—Half-kneeling shelter position. Honeywell Road Board School, London, S.W.

movements, without which the exercise loses its value. The system also disapproves of imitation, memorising, &c., as such tend to cause the work to become purely mechanical, while to some extent discipline is sacrificed. Music is conspicuous by its absence, the system positively condemning it on all occasions, contending that there are few gymnastic exercises which are rhythmical, and

hand in hand, while any number of pupils can be taught by one teacher. Being independent of elaborate apparatus for the proper execution of the exercises, the system is extremely practical. The exercises can be executed in the class-room, hall, or playground, provided sufficient space is available. Singing in conjunction with the exercises is rigidly forbidden, but it is encouraged

whilst marching. All movements must be performed with unerring accuracy, and each must be repeated a given number of times. Although every movement must be done by word of command according to some authorities, others say that the pupils may "judge their own time."

The system claims that exercises practised from ten to fifteen minutes daily throughout ordinary school life will be productive of important physical results. The exercises will take but little time from the lessons of the day, and will be attractive to the pupils of all ages, proving a great relief from nervous tension. They will not only be restful to the body, thereby promoting a proper circulation of the blood, and keeping the entire physical system in a vigorous condition, but they will promote good humour, cheerfulness, and a natural and healthy tone of mind. In short, the exercises will add much, not only to the health, but also to the happiness of the teachers and pupils, as they contain all either sex needs for the perfect development of the body.

One notable characteristic of the system is the multiplicity of Tables of Exercises, scientifically arranged, and generally known as "day's order." In these tables the exercises are claimed to be set forth in their progressive sequence, and graduated to meet the requirements of school children of various ages. They contain those exercises which are to be done in one lesson, and nothing else. Such tables are more or less observed in schools which have adopted the system, as by their observance an accurate and effective display is possible, owing to the frequent repetition of the same exercises. The progression is very definite and rigid, both as regards the exercises in each table and the progress from table to table. Each table consists of from six to twelve exercises, according to the views of the compiler, commencing with movements of the lower extremities and terminating with those for the neck. Occasionally, tables are found in which the exercises occur in a contrary order, but such are the exception. After all that has been said on this point there are no two textbooks which contain identical tables, neither do any two professors agree as to the sequence of these tables.

The name "Swedish Drill" is, in England, frequently misleading, the vast majority of people considering that any system, so long as performed as free movements, is Swedish. Hence a great deal of misunderstanding has been created. There are many excellent systems of free movements which are distinct from the Swedish, notably the German and Swiss. Still, the Swedish authorities maintain that, although a teacher may use free movements dissimilar from those taught in the Swedish system, and even use such appliances as dumb-bells, clubs, sceptres, wands, &c., the fact remains that the work is still Swedish.

The system of Physical Exercises taught throughout girls' departments of the schools under the School Board for London, and those of a few provincial Boards, is undoubtedly founded on the Swedish system; but, as nearly every instructor

has simplified and modified the system, either by applying music to the exercises, discarding some movements entirely and substituting others of a more attractive character, or introducing dumb-bells, wands, &c. (which latter practice also obtains in a few training colleges for mistresses which have adopted the system), it has become difficult to know where the original system leaves off and the modernised one commences. In every instance where such innovations have been introduced, they have been thoroughly successful, and there is no inclination on the part of the instructors or class teachers to return to their previous methods; in fact, the improvements are daily on the increase, thereby insuring better results than formerly in every case.

BATTERIES FOR LABORATORY WORK.

By A. E. MUNBY, M.A.

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THE subject of batteries is so well-worn, and so few workers in the field of practical physics have themselves failed to search for a suitable cell for laboratory work, that I have some hesitation in placing my opinions on paper.

Investigations upon primary cells, undertaken with the object of finding a really possible cell for continuous, heavy work, are often begun in hope and finished in dejection, and there is no question but that, when more than a few watts are required for anything like regular work, a dynamo is the only satisfactory solution. For occasional work of a rather heavy nature, and for the isolated individual work involved in a course of practical electricity, or in a piece of research, primary cells, however, are of the greatest value.

The selection of a cell suitable for a given purpose depends not only on the difference of potential between the poles and upon the internal resistance of the electrolyte, but also upon the prime cost, trouble involved in recharging, and cleanliness in use. In spite of the legion of cells which have been devised, there are comparatively few possessing claims to general use, and in every one zinc is found most suitable as the fuel or negative pole. The ideal cell would be one possessing a small internal resistance, giving a constant current even on short circuit, without waste on open circuit, requiring no amalgamation, containing no corrosive liquids, light in weight for its output, and having a negative plate and electrolyte easily replaced at short notice.

The cells which are most prominently before the public at the present time are the so-called DRY CELLS, which are of the Leclanché type, and have recently been greatly improved in the matter of internal resistance. The negative pole generally forms the exterior wall of the cell and the exciting fluid is absorbed in some indifferent compound, such as sulphate of lime. These cells have the ad-

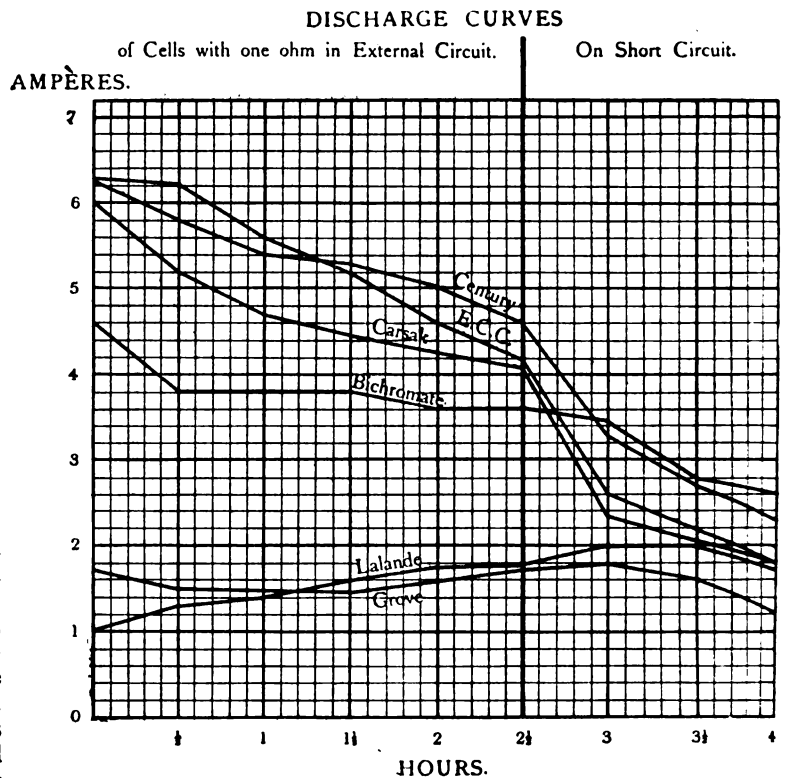
vantage of portability, are unbreakable and have nothing to spill. Many of them are also exceedingly efficient when new. They have the disadvantage of giving no indication of condition till used, often therefore failing at a critical time. They are generally somewhat expensive, and the wire usually attached to the zinc for connection is apt to be broken off if often bent, though these two last defects are absent in the *Century Dry Cell*, mentioned later. They are usually exhausted long before the zinc is consumed; and though some makers (*e.g.*, of the *E.C.C. Cells*) allow half the cost on purchasing new cells when the old ones are returned, their great weight usually decreases the value of this advantage, owing to the cost of transit. There is a very large number of Dry Cells on the market, all very similar in construction. According to Mr. W. R. Cooper, out of nine types tested by him, the *E.C.C.*, *Hellesden*, and *Obach* were the most efficient; the *Century Cell*, however, is not included in the list.

The chief advantage of *WET* over dry cells lies in the possibility of renewing the solutions and negative plates when these become exhausted; but if the labour involved in this process is anything but trifling, this advantage is much smaller than is generally supposed. For this reason, double-fluid cells and those containing zinc plates of peculiar form should be avoided if possible.

It is further generally essential that cells employed should stand well on open circuit, in which respect dry cells generally behave properly, but many wet cells rapidly deteriorate when left unused. Since the kind of cell adopted must depend largely on the object for which it is to be used, it will be better, instead of generalising further, to attempt to classify the requirements of the laboratory as follows:—(1) Large currents at low E.M.F. for a few hours continuous run for motor work, small lamps, electrolysis, &c. (2) Moderate constant currents for the isolated work of students. (3) Small, fairly constant currents for mirror galvanometer work, or the testing of battery resistance. (4) Intermittent currents for bell ringing, gas analysis work, &c.

In order to gain an insight into the sustaining power of cells capable of giving fairly heavy currents, experiments have been made upon six cells for the purpose of this article, and the results are shown in the form of discharge curves (Fig. 1). As shown in this diagram, tests were made every half hour; first, with one ohm (a spiral of No. 24 platinoid wire) in circuit; then, without any interval of rest, on short circuit. A Stanley D'Arsonval testing instrument was employed

which is fairly dead-beat, and by the use of mercury cups, the time required for making each test and again completing the circuit did not average more than about twenty seconds. Naturally, the resistance in the external circuit was not constant owing to the rise of temperature, but since an alloy was used, and the cell itself decreased in resistance on account of the heating of the electrolyte, the error was probably smaller than might appear at first sight. The cells were not all of the same size, but were those most commonly used in a laboratory. The *E.C.C.* was a No. 2, 65 cms. in diameter and 15 cms. high; the *Century* was the same size;



Tests show the current given on short circuit; the first test being made with the cell newly set up, before use.

Fig. 1.

the *Carsak* the same size, allowing for the wall of the cell. The *Bichromate* was the ordinary one-pint bottle form, the *Grove* a half-pint cell in which chromic acid was used, and the *Lalande*, 7 cms. in diameter by 10 cms. high, internally, constructed as described below.

Turning now to a consideration of the cells in detail under their respective classes:—

(1) *Large currents for several hours.*—The favourite cell for such work was, and still often is, the *Grove*. The curve given by it shows that it bears a heavy call well, but its internal resistance is against it. Further, when nitric acid is used, it is most objectionable unless placed in a good draught, and its initial cost and cost of maintenance are heavy. The *Grove* cell, however, has a higher E.M.F.

than any cell which can pretend to give a constant current. These remarks may be applied also to the Bunsen cell, which, however, is not so clean in use as the Grove.

The SCHANSCHIEFF cell, some fifteen years ago, caused a little stir among those interested in these matters. The plates are zinc and carbon, and the solution sulphate of mercury in sulphuric acid. The cell, naturally, has a low resistance, and claims to be very constant. When exhausted, the mercury reduced must be reconverted into sulphate. Anybody who has conducted this operation will probably agree that this constitutes a serious blow to the utility of the cell. The mercury, moreover, renders the zinc very brittle.

The CARSAK cell (Fig. 2), of the General Electric Company, of Queen Victoria Street, is a remarkable instance of what can be done with the Lelanché type of cell. The zinc is a stout sheet, bent into a cylinder, and could easily be replaced from the usual laboratory stock of sheet-metals. The carbon is packed in manganese peroxide, held in place by a linen wrapper, the ends of the cylinder thus formed being discs of wood. The solution is ammonium chloride, or a mixture of this with a salt of zinc. In the latest form, the cell itself is made of glazed *papiermâché*, which renders it light

and unbreakable. The depolariser might be contrived to be rather more readily replaceable, but the absence of corrosive liquids and local action, and its good behaviour under test, as shown by its curve, certainly renders it worthy of careful consideration both for heavy work and students' isolated work.

The LALANDE cell, as referred to above, is the old Lalande Chaperon cell, the plates being zinc and copper, the exciting liquid caustic soda or potash, and the depolariser copper oxide. I have used it for some time for students' work on account of its great constancy and low resistance, and have recently adopted the copper oxide plate of the Cupron Element Co. as a great improvement on my own. This is plate and depolariser in one, and largely regenerates on exposure to air when reduced. In the cell tested (Fig. 1), I use half of one of the smallest copper oxide plates made by the Company; sheet zinc, which can be cut with hand shears, and about 300 c.c. solution of potash (1 potash to 5 of water by weight) — Fig. 3.

The E.M.F. is low, only 0.75 volt, and in spite of statements to the contrary, the cell does not stand well for long intervals on open circuit. I have had a cell (bought complete) on open circuit for one year, and it has completely fallen to pieces. The

General Electric Co., however, in their Edison-Lalande, recommend a layer of oil over the solution, which may largely prevent this deterioration. In running, the cell is undoubtedly very economical and efficient.

Dry Cells have been already reviewed, and the curves of Fig. 1 show what large currents can be obtained from them. The E.C.C. and Century cells are shown in Figs. 4 and 5, taken (as in Fig. 2)



Fig. 2.



Fig. 4.



Fig. 5.

by the kind permission of the General Electric Co., from their list. The latter will be a boon to many on account of its small cost. It is arranged with a binding screw, instead of a wire, attached to the zinc.

(2) *Moderate constant currents for isolated work of Students.*—For this work, either the Lalande, Carzak, or in certain cases Dry Cells may be recommended. These have already been described. Since the success of a student's work so often depends upon a cell giving a suitable current, a small ammeter, reading say to 6 ampères (which can be purchased for 12s. 6d.), should be fixed up in the laboratory, and its terminals brought down to two points, with which the actual terminals of the cell can make direct contact. With such an arrangement a cell's condition can be discovered in a few seconds.

(3) *For small currents*, the DANIELL, which needs no description here, is, of course, very suitable, and, if zinc sulphate be used in place of acid, it can remain set up for long intervals. A dry cell permanently stopped down by a coil of resistance wire wound round its exterior may also be used. When it is necessary to have several cells to give the same small current as for comparing the value of parallel and series arrangement, I have, after a number of experiments on sawdust Daniells, sawdust Lalandes, and the like, come to the conclusion that the simple Volta cell is the best. With amalgamated zincs it is much more constant for intermittent work than is often supposed,

and by adding the same amount of dilute acid to each cell the same resistance can be obtained in each. With four home-made cells, as shown in

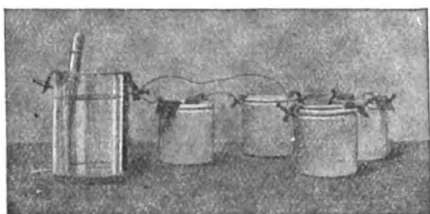


Fig. 6.

Fig. 6, most successful investigations on series, parallel and mixed circuits with external resistances between 0.2 and 2 ohms, can be made.

(4) *Intermittent currents for bells, &c.*, are best supplied by a Leclanché cell in one of its many forms, since no other cell stands so well on open circuit. Dry cells are very popular as a substitute for the old porous pot Leclanché, which is now but seldom used. Finally, for larger intermittent currents than are usually required for bell work, the bottle Bichromate is very useful, more, perhaps, on account of its construction, which renders no switch necessary, and completely removes the negative from the liquid, than because of any other merits. The results of the test given in Fig. 1, however, show it to be capable, when newly set up, of giving a very creditable curve.

I have reached the space limits assigned to me without reference to Secondary Batteries. Some very compact forms of cell are now made for motor-car work. Secondary cells require some care in charging, discharging, and handling. They must always be charged if they are to stand long on open circuit, and even then deteriorate in time, if not used. Their chief advantage lies in the variation of current and voltage which they can produce, and they are often used as direct current transformers. Generally speaking, however, when the high voltage of a dynamo circuit requires reducing, if to effect this by the introduction of resistance is too extravagant, a motor transformer is the best thing to use. Excellent machines with several windings on the armature and double commutators are now made for converting direct high to direct low E.M.F., direct to alternating current, or *vice versa*, and to run as motors. They are necessarily rather costly, but will do a great variety of work.

The Child and the Education Question.—Education should leave the mind quick to observe and ready to ask questions. These are the two qualities which should be called out in everybody's mind. If real intelligence is to remain through life, this method must be resorted to, and I ask: Is the present system of education likely to make children alert and curious and eager to ask questions? Discipline forbids it, and a child who asks a question would probably be promptly suppressed like the guinea-pig in "Alice in Wonderland." The more we have a system which aims at producing certain results on a certain day, the more we shall injure the capacity for perpetual observation and perpetual curiosity.—Bishop Creighton.

TRAINING IN SCIENTIFIC METHOD.

IN a letter to *The Irish Teachers' Journal* of August 2nd, commenting on a leading article in the previous issue of our contemporary, which dealt with certain views expressed in a lecture by him to Irish teachers of chemistry, Sir William Ramsay characterises the heuristic system as applied to chemistry as "rank humbug," and makes the astonishing statement "that it is only ignorance of chemistry on the part of the propounders of this system, and a wholly unphilosophical view of the function of the teacher, that could possibly have led to its inception."

To run no risk of misinterpretation, it will be best to quote the whole of the paragraph in which an estimate is formed of the educational value of chemistry as a school subject. Sir William Ramsay says:—

You argue that "it is not possible to form the habit of observing, comparing, and reasoning accurately without affording the pupils ample opportunity of exercising the necessary faculties while they are in attendance at the school." Although there is a certain modicum of truth in this assertion, I maintain that chemistry is the last subject I would choose for the purpose of cultivating these faculties. It is far too difficult, and the conclusions rest on far too obscure, and complicated, premises to be suitable for a boy's comprehension, until he attains such a growth and development of mind that he may be set to study philosophy with profit. Now it is universally agreed that it is unprofitable to commence philosophical studies until the pupils have attained at least the age of 18 or 19; their brains are not sufficiently developed. Chemistry is at least as difficult as philosophy. Yet while certain philosophical conclusions bearing on every-day life are common property, and may be stated even to very young children as *dogmata*, so also certain conclusions regarding chemical phenomena may be similarly stated. But such conclusions are not gained so far as the children are concerned by a process of reasoning, but are stated by the teacher as worthy of acceptance; and they are accepted by the child in faith. So too, the child will accept chemical statements; and it is this that I object to, that the pupil is led to believe that he has arrived spontaneously at such conclusions, inferring them from his observations, whereas they are no more his own than the "discovery" that the perfect of *tango* is *tetigi*. The heuristic system, as applied to chemistry, is, as I said, "rank humbug."

Sir William Ramsay's eminence amongst men of science demands that a careful consideration should be given to any utterance of his as to the right course to pursue in arranging the science instruction in our schools. What has come to be called the "heuristic" method of teaching science has already exerted so wide an influence on methods of teaching, on examination syllabuses, and on school text-books, and has, in the judgment of competent observers, effected so marked an improvement in the mental equipment of the boys and girls educated by its means, that it is to be hoped that teachers will hesitate to accept as final, without further earnest examination, the pronouncement that "as applied to chemistry, it is arrant humbug."

Half the differences of opinion in educational matters arise from the misuse of names, and it is

probable that what Sir William Ramsay means by "heuristic," and what the advocates of the research method of teaching mean, are not at all the same thing. It may be said at once that to let boys and girls loose in a laboratory with a general instruction to acquire scientific knowledge for themselves would be absurd. But to insist that, however clearly facts may be "stated by the teacher as worthy of acceptance," science cannot be properly taught in this way, is the plain duty of every man who considers that the essential requirement in education is a rational training in the scientific method.

We believe that a course of practical work in the rudiments of physics and chemistry, such as is being introduced into Irish schools, is of the greatest value in mental training. It is based upon the principle of self-help, which is at the bottom of all sound education, and it throughout substitutes things for mere words. Under the old system, the aim of the science teacher was to fill his pupils with as much information as possible, and show striking experiments to brighten the arid waste of words he wrote upon the blackboard. This method of teaching science is educationally bad, as every good teacher has long discovered. The new plan is sound in principle and inspiring in practice, and no teacher who has freedom of choice and has introduced modern ideas wishes to go back to the bad old methods. The mistake is to regard the work as a course of formal chemistry; for it is rather an introduction to scientific procedure, aiming at the cultivation of scientific habits of thought, at accuracy of observation, dexterity of manipulation, and the necessity of taking account of small matters. We are convinced that "heuristic" teaching on the lines of the Irish course provides a means of education which benefits every pupil who follows it, and will prove of value to himself and to the community.

What are the objects which teachers of science responsible for the education of boys and girls should have in view? Evidently it is not the business of the school to produce physicists and chemists; it may be said boldly that it is not for the facts of science which the child may pick up during his school years that science is included in the curriculum. The function of the teacher is to see that as many faculties as possible of each of his pupils are healthily developed. It is now understood that the youthful mind possesses something in addition to a verbal memory. As every practical schoolmaster knows, pupils can be led to cultivate faculties of observation, comparison, and reasoning. Scores of science masters up and down the country know very well that boys can reason accurately about the simple observations included in a school course of chemistry, such as that adopted by the committee of the Headmasters' Association. Rusting, burning, the composition of air and water, and similar subjects, only constitute a small part of formal chemistry, and it might be a good thing to call our school science neither physics nor chemistry, but "an introduction to the methods of science," and about these we have no hesitation in

saying that the boy can, by a sympathetic and patient teacher, be brought to reason intelligently. With all due respect to Sir William Ramsay, we maintain that conclusions in problems of this kind are neither obscure nor complicated.

Men of science have had to fight so hard for the introduction of practical teaching in science in our schools, and even now have gained but a partial success, that it would be calamitous if the *obiter dicta* of a distinguished chemist were to obtain credence as the deliberate conclusions of a considerable section of men of science with a knowledge of educational problems. Any science masters who, after reading the letter to which attention has been directed, are tempted to doubt the value of the work in introductory physics and chemistry advocated by the champions of the inductive methods of science teaching should re-read Huxley's volume of "Science and Education," and they will continue their work of trying to bring their pupils to arrive spontaneously at their own conclusions.

Finally, we consider that, as Sir William Ramsay is not in sympathy with the work being introduced into Irish schools, he should not have gone out of his way to ridicule the methods to teachers who have to follow them. We are reminded very forcibly of the perverseness of Balaam in exactly reversing the instructions he received from Balak, though Sir William cannot urge the same excuses as Balaam could.

ROYAL COMMISSION ON UNIVERSITY EDUCATION IN IRELAND.

LORD CADOGAN'S Viceroyalty in Ireland has been marked by three important Educational Commissions. The first concerned Manual Instruction in Primary Schools, the second Intermediate Education, and the third is the one now inquiring into University Education. The exact terms of reference are: "To inquire into the present condition of the higher, general, and technical education available in Ireland outside Trinity College, Dublin, and to report as to what reforms, if any, are desirable to render that education adequate to the needs of the Irish people." The first two commissions have already resulted in actual reforms, both in Primary and Intermediate Education, and in this is an omen that the third will not be without practical result. The problem set, however, is a far more thorny one, being bound up with political and religious prejudices which have hitherto always prevented any settlement of the question likely to be final.

The Commission opened last September, and held nine sittings in Dublin, the minutes of the evidence taken at which are published in the appendix to the first report. There has also been published an appendix to the second report containing minutes of evidence taken at the second session in Dublin in November, and at the third

session in London in December. These two volumes contain a great amount of evidence from every point of view, one advantage, or disadvantage, of a commission being that the subject under consideration is copiously dealt with by all kinds of persons interested. Although the final report cannot be anticipated, the conditions of the problem may be taken as now fully set forth, and the rival solutions stand marshalled in array one against another.

Outside Trinity College we have in Ireland for purposes of University education the most anomalous system in the world. The Royal University, established in 1880, and with a present annual income of nearly £26,000, is an examining institution conferring degrees. In close connection with it are the three endowed Queen's Colleges of Belfast, Cork, and Galway, whose work is largely, if not almost entirely, to prepare matriculated students for the Royal University examinations. Residence or attendance at lectures at these colleges does not count towards a degree. Other institutions, besides the Queen's Colleges, also prepare for the Royal University, notably the Catholic University College, in St. Stephen's Green, founded by Newman in 1854, and handed over in 1883 by the Bishops to the management of the Jesuits; Victoria College in Belfast, and Alexandra College in Dublin, both colleges for women; Magee College, Londonderry, a denominational college for Presbyterians, but without tests; and Kelvin House in Belfast, a coaching establishment, which has proved a formidable rival to the Queen's College there. The examinations of the Royal University are conducted by the Fellows, of whom there are twenty-nine. The holding of a fellowship is subject to the condition that a Fellow must teach in one of the Queen's Colleges, in the Catholic University College, or in the Magee College. The fellowships are of the value of £400 a year, and are apportioned fifteen to the Catholic University College, seven to Queen's College, Belfast, three each to the Queen's Colleges at Cork and Galway, and one to the Magee College. In the Queen's Colleges a Fellow receives the difference between his salary and the £400, in the other colleges he receives the £400 in full. Thus, the Catholic University College receives an indirect endowment of £6,000 a year; the Presbyterian Magee College, £400 a year; Queen's College, Belfast, £676; Queen's College, Cork, £344; and Queen's College, Galway, £320. There are also some further payments to the colleges in respect of other examiners.

The Royal University has nothing to do with the choice of the professors; in the Queen's Colleges they are chosen by the Crown, and in the others by the Colleges themselves. The University is, therefore, closely restricted in its choice of Fellows. Two things have followed from this. One is the indirect endowment of Catholic University education by the State, by which the principle of Catholic endowment has been given away. The other is the advantage in the examinations of the Colleges with Fellows over others, and of the Catholic University College in particular, with its fifteen

fellows who are also examiners, over all the other colleges. This has led to complaints, especially in reference to the medical examinations.

The government of the Royal University is vested in a senate of thirty-six members, so arranged that the number of Roman Catholics and Protestants should be kept practically equal.

It is certain that the Royal University has supplied a want. On an average 700 candidates have entered for matriculation every year, and 500 have passed; and about 250 have proceeded to the degree examinations in Arts and Medicine, between 150 and 200 graduating. But the defects of the system have been glaring. Outside of Trinity College there has been no place where university education proper could be obtained, and a parent objecting to Trinity College has been debarred from giving his sons a university education in Ireland. The present position may be considered from three points of view: (1) that of the Roman Catholics, (2) that of the Queen's Colleges, and (3) that of the education of women. The history of the relation of the Roman Catholic Bishops to Irish higher education is well given in Dr. Starkie's evidence, but the practical outcome has been that they have objected to members of their religion going either to Trinity College or to the Queen's Colleges. A few, it is true, have entered Trinity or attended the Queen's Colleges. Intending priests also have been provided for in Maynooth College, endowed by the State with a capital sum of £400,000, but a large majority of Roman Catholics have been excluded from the benefits of university education owing to the absence of any residential university of which the Roman Catholic episcopacy approved. Dr. O'Dwyer, the Roman Catholic Bishop of Limerick, states the Catholic ideal thus:—

Our ideal of education is that religion and secular knowledge cannot be separated, and that at the time between, say, eighteen years of age and twenty-five years of age, when every thinking young man is turning over in his mind the fundamental questions of life, it is necessary for him to be brought up in surroundings that will be congenial to his faith and favourable to the growth of it.

The Roman Catholic demand, therefore, is for a university or a university college which shall fulfil this ideal, just as Trinity College satisfies the Protestant ideal. The Test Acts would be applied so that the institution would be open to all comers, and, subject to an exception as regards theological chairs, adequate endowment is asked from the State.

The Royal University has acted as a blight on the Queen's Colleges. Under the old Queen's University (1845-1881), although they did not attain the object for which they were established, viz., of attracting Roman Catholics, they did excellent work and turned out a remarkable number of able men. The difference between their prosperity in 1881 and 1900 is shown by the following figures. The number of students in each of the Queen's Colleges:

	1881-2.	1899-1900.	DECREASE.
Belfast	567	347	220 or 30 per cent.
Cork... ..	402	178	224 or 55 "
Galway	201	110	91 or 46 "
	1170	635	

The decrease has steadily taken place in all three colleges and in all denominations, most remarkably in Belfast, where the Presbyterians have decreased from 353 to 247, *i.e.*, by 108, or 30 per cent. This result is due to the instability of the Universities. The Queen's University of 35 years' standing being replaced by the obviously temporary Royal, the value of the latter's degrees was discounted. But a more powerful reason is that everything has become subordinate to examination, and unless the Professors are willing to prepare merely for examinations, candidates prefer a coach to a college; so much so that Kelvin House sends more pass students to the Royal University than Queen's College, Belfast. Again, the preponderance of Fellows in the Catholic University College has created an impression that the Queen's Colleges are handicapped in the examinations. The Queen's Colleges, therefore, demand reform that will restore their prosperity, principally a return to a residential system, more internal liberty, especially in conducting examinations for pass students, the appointment of external examiners in all the Royal University examinations, and a reconstitution of the Senate on more academic lines.

Women, again, have a grievance under the present system. The Royal University is their only avenue to a degree in Ireland, and the Queen's Colleges are open to them, but the two chief women's colleges in Ireland, Victoria College, Belfast, and Alexandra College, Dublin, have no endowment, and in Dublin the only endowed college open to them is Roman Catholic. Women in Dublin are in rather a worse position than the Roman Catholics in Ireland. The Roman Catholics say: "The place of education which we prefer is only indirectly and very inadequately endowed, while the atmosphere of Trinity College, where we are asked to go, is pestilential to us." The women of Dublin say: "Our college has no endowment at all, and the Protestants among us—a large majority—can only obtain teaching from Fellows by entering a Roman Catholic College." All prizes in the Royal University are open to women, but neither fellowships nor places on the Senate. Miss White has given some interesting figures showing the position of women in the Royal University:

In the Matriculation of 1897, 486 men matriculated and 174 women—that is, about 73 per cent. of men and 26 per cent. of women. When that same class came to take B.A. degree in 1901 there were 84 men, or 59 per cent., and 61 women, or 41 per cent.—that is to say, the percentage of men in matriculation fell from 73 to 59 per cent., while women increased from 26 per cent. to 41 per cent. Roughly speaking, the women were 1 : 3 at Matriculation, and 3 : 4 at B.A.

Women, therefore, demand in any new university equality of treatment with men, both in status

and endowment. Such, then, are some of the problems and demands. What are the proposed solutions? The chief of them may be summarised as follows:

(1) The establishment of one or more colleges on an equality with Trinity College under Dublin University. Dublin University would then cease to be a university with only one college, and the new colleges would benefit by association with Trinity College, since Dublin University would lend them an ancient name and guarantee the standard of their degrees. The new colleges would be adequately endowed according to their requirements and practically autonomous. There would be one for Roman Catholics preferably in Dublin, one for Presbyterians in Belfast, and others, perhaps, in Cork and Galway. All these colleges would be open to women. Such a scheme would have the great merit of finality, and is favoured by such witnesses as the Chief Baron, the O'Conor Don, Dr. Mahaffy, Mr. Lecky, and, apparently, the Roman Catholic Bishop of Limerick.

(2) The Roman Catholic Bishops propose a Roman Catholic University, pure and simple, in Dublin, subject to the Test Acts, which would have an atmosphere as Catholic as that of Trinity is Protestant. As a corollary they propose also a Presbyterian University in Belfast. The Cork College would be affiliated to the new Catholic University, and Galway might, perhaps, become an Agricultural College. The objections to this are that the Presbyterians, as a whole, are not in favour of a university in Belfast and object to denominational universities, and, again, that no account is taken of the position of women. A fear is also expressed that such a university might have a low standard of education and enter into unfair competition with the existing universities.

(3) The reconstitution of the Royal University into a teaching and residential university, with colleges in Dublin, Belfast, Cork and Galway, giving to each the atmosphere of its locality and an endowment and a constitution suitable to its requirements. This would ensure a proper educational standard, especially if external examiners were employed. The Senate would need remodeling, so as to become academic and representative of the graduates and constituent colleges, and, by thinking first of education, religious friction could probably be avoided. The objection to this is that it does not grant Roman Catholics that position of equality with Trinity College to which they believe themselves entitled.

(4) Other proposals resolve themselves practically into maintaining the *status quo* of the Royal University as an examining university, while introducing changes into the Senate and government, bringing in external examiners and taking all possible steps to guarantee the absolute fairness and adequate standard of the examinations. This course, it is thought, might stop all further agitation and give Irish university education the rest which it requires. But what if these hopes prove illusory?

The two volumes under consideration also con-

tain a large amount of information on technical and technological education in reference to primary, secondary, and university work, and suggestions as to the co-ordination of the Royal College of Science with the proposed new colleges. The enormous expense of duplicating the apparatus and laboratories needful for technical and scientific education, especially in connection with higher teaching, is sure to be a strong argument in favour of one rather than many universities.

UNIVERSITY EXTENSION SUMMER MEETING, CAMBRIDGE, 1902.

(FROM OUR CAMBRIDGE CORRESPONDENT.)

TWO years ago the general subject of the Summer Meeting held at Cambridge was "Life and Thought in England in the Nineteenth Century." This year the general subject is "Some Aspects of Life and Thought in Europe and America in the Nineteenth Century." It will be observed at once that, while the present programme supplements that of two years ago, it definitely aims at making a less complete survey of a wider field. America, though it figures prominently on the title-page of the syllabus, receives only five out of a total of about 150 lectures. Among the less obvious points of contrast between the two programmes are these: Literature and Art takes the place of Natural Science as the chief among the subjects grouped round the central core of History; there is no such systematic treatment of Education as that embodied in the 1900 programme;¹ but, on the other hand, there has been arranged a series of lectures and model lessons on the teaching of Modern Languages and Nature Study, and Music has been brought in to illustrate the various lectures on national history. This last innovation has been universally acclaimed as a stroke of genius, and Mr. Bernard Pares, of St. John's College, has been deservedly praised for the thorough way in which he has carried out his own excellent suggestion. University College, Liverpool, should be warmly congratulated on securing as its staff lecturer in History a man who is so free from the bookishness and insularity which cripples so many of our young historians. As regards the general organisation of the meeting—by Dr. Roberts and his successor, Mr. Cranage, and by Mr. F. A. Kirkpatrick, their working deputy—nothing need be added to what was said in these pages two years ago. The arrangements have been carefully made and clearly indicated; and the authorities have been indefatigable in providing for the comfort and convenience of the unprecedentedly large numbers (about 900) attending the Summer Meeting.

At the time of writing this notice only about

one-third of the course has been completed; and a complete account is, therefore, impossible—unless one tries to rival the feat of the lady journalist who described the gala performance at the opera (criticising the singers) which never took place on the occasion of the deferred Coronation. It is proposed to indicate here the general nature of the programme and to defer the treatment of the special work on Education to a future number.

The "central subject" has been History, and the chief history lectures have been assigned to the central period of the morning (10.30-11.30), and have in all cases been left free from counter-attractions. These central lectures are to be published in the autumn by the University Press, and so far promise to be well worth perusal. If they are adequately edited and equipped with practical bibliographies and a good index, they should also be worthy of purchase as a constant guide to the study of contemporary history. These lectures include the disappointing inaugural address by Dr. A. W. Ward, the Vice-Chancellor; the extremely valuable "Introduction to the International History of Europe in the Nineteenth Century," by Professor Westlake; and a series of discourses on the history of various countries, sometimes by foreigners—*e.g.*, Professor Mantoux on France, Dr. Emil Reich on Austria-Hungary, Professor Marcks on Germany, Professor Vinogradoff on Russia—and sometimes by British scholars, such as Messrs. Bolton King, G. P. Gooch, J. H. Rose, and others. The lectures on the five Great Powers of Europe have been, and are to be, preceded by preparatory lectures by Mr. Bernard Pares, who has performed his work as pioneer with great lucidity, modesty and tact, and have been illustrated by musical evenings devoted to the national music of the several countries, in which foreign visitors have given cordial assistance. These central lectures have been supplemented by various lectures on biography, literature, art and theology. Lying outside the range of the general syllabus, there are courses for which special fees are being charged—in Physical Geography, by Mr. H. Yule Oldham, and in Nature Study by Messrs. R. H. Adie, R. H. Biffen, and T. B. Wood.

Of the lectures so far given and not directly noticed above, some have been pronounced failures and some have been generally recognised to possess surpassing merit. Let us give two specimens of the latter group: Dr. Waldstein's "Achievements of Art in the Nineteenth Century" and Prof. R. G. Moulton's two lectures on "Nineteenth Century Developments of Shakespeare's Materials." Dr. Waldstein's lecture is memorable for two things: it was an admirable introductory lecture to the series of lectures on Art subjects, and supplied the hearers with a clue to the whole subject, and it was delivered in such a way as to extort applause and excite interest even on the part of those who are not much interested in Art. It is being printed, by request. Canon Lyttelton, in his very variously criticised address on "Educa-

¹ These 1900 Lectures were published in a volume entitled "Education in the Nineteenth Century," which has been reviewed in these columns (Camb. Univ. Press, 4s.). Syllabuses of both sets of lectures are also published (price 1s. each; 1s. 6d. interleaved).

tional Progress in the Nineteenth Century," suggested that the chief use of lectures was to inculcate the "art of forgetting"; but Dr. Waldstein's lecture illustrated two other equally legitimate and perhaps more useful functions of the lecture—namely, *stimulus* and *guidance*. Prof. Moulton's addresses—which will, probably, not remain unpublished—not only exhibited the stimulating influence of which lectures are capable, but also gave a valuable exhibition of the way in which lessons on literature may be made vital and helpful. One may safely predict that the literature lessons in three or four hundred schools will be the better for Prof. Moulton's object-lesson.

By way of contrast with these supremely successful lectures—both in matter and in form—one may point out that there were some lectures which, although good in matter, failed to obtain complete success because of some blemish in manner of delivery, while others, marked by great poverty of thought, obtained applause solely, one would think, because they were uttered in an agreeable way. Decidedly the hearing of many lectures ought to give the large number of teachers present some useful hints as to method of treatment. The mere matter of the lectures can readily be obtained from books; but what "reads" well doesn't always "speak" well.

THE NATURE-STUDY EXHIBITION.

By F. W. HEADLEY, M.A.
Haileybury College.

THE Nature-study Exhibition has been a great success in almost every way. Though many schools did not contribute, yet all classes of schools were well represented, and there is indisputable evidence that the study of nature has not entirely given place to that of books. Even in the case of schools that sent no exhibits at all, we are not justified in concluding that work of the kind which this exhibition was designed to encourage has been neglected. Some of the public schools, where nature is studied in the right way and with excellent results, have *more suo* treated the exhibition with a certain *hauteur*, as much as to say: "We want no encouragement from exhibitions, no galvanising into activity; we are self-sufficient and want no help from others." This may be perfectly true, but institutions which stand so firmly on their own basis are in a position to help others, though they themselves require no help. There are other schools, however, among those which failed to exhibit, where nature-study is little accounted of, and pines and dwindles in a soil in which Latin verses and athletics grow rank, to the exclusion of some things that do not deserve to be jostled out of existence. It is to be hoped that the wave of interest set in motion by this exhibition will not die away till it reaches those institutions. Perhaps the interest will not

be aroused in the most direct way, for though large numbers found their way to the Botanic Gardens, and pored over all that was to be seen with the utmost care and attention, yet public schoolmasters, if my own observation is correct, were conspicuous by their absence, having no doubt started for their summer holidays without letting anything that might remind them of school delay their departure. This is very natural, though much to be regretted. But the exhibition must have exercised a very great indirect influence. Ample justice has been done to it by the daily papers and scientific magazines, so that it may have its effect upon those who were too busy or too indifferent to pay it a visit.

THE MEANING OF NATURE-STUDY.

The term nature-study was well chosen. Any one who with open eyes looks at and observes the objects of wonder that the natural world has to show is a student of nature. It is necessary to realise how wide is the scope of the exhibition, or else one may be tempted to criticise much of the work as not quite to the point. For instance, a St. Paul's boy exhibited some good coloured figures of butterflies, and there were some excellent drawings of trees. In such cases one cannot help wondering whether the boy is an artist or a naturalist. But in either case his work is proper to an exhibition such as this, since it tends to foster the observation and the love of nature. Such a boy may become an artist, or, proceeding from the observation of phenomena to the investigation of their causes, he may develop into a man of science. In either case he has learnt much by carefully drawing what he sees.

The excellent work done by one St. Paul's boy sets one thinking on a much-vexed question, the comparative advantages of day schools and boarding schools. No doubt a boy in an intelligent home has much in the way of intellectual stimulus that he will never find when he is all day long with his schoolfellows. Notably, a bent towards Natural History is more likely to find opportunities if he is a day boy. Each system has its advantages: the very merit of a boarding school, the fulness of its corporate life, may in some cases prevent development along the best and most natural lines.

INDOORS OR OUT OF DOORS?

Nature may be studied indoors or out of doors. The latter is the method most to be commended, and this seems to have been the view taken by those who awarded the numerous prizes. In many cases the outdoor work took the form of collections of plants or butterflies. Though not high-class work, this is by no means to be despised. It is impossible to collect plants and name them correctly without learning something about them. And here I may remark that rational collecting would be much encouraged if schools brought out printed lists of the animals and plants found in the

neighbourhood, in an easily portable form and interleaved so that the collector can record his observations. Haileybury, as far as I know, is the only school which exhibited anything of the kind, and its "Fauna and Flora" proved so interesting to some zealous, though not over-scrupulous visitor, that it disappeared before the close of the exhibition. I would suggest, too, that there should be more variety. Why for ever butterflies and flowers? Why should bees, wasps, dragon-flies and mosses be neglected?

SOMETHING BEYOND COLLECTING.

A mere collector is only a half-developed naturalist, but boys in their teens can only in exceptional cases be got to observe for the sake of observing, to collect, in fact, anything as intangible as mere observations. A boy at Bootham School has done work beyond the ordinary, putting together caterpillar, chrysalis and moth, or butterfly, on the proper food plant so as to show the life history. This has required a good deal of skill, and probably has led to a good deal of observation. Whether he has worked in the spirit of an artist or the spirit of a man of science is a question that remains open. In either case he has learnt something of nature at first hand. At Bootham School the practice of keeping diaries and recording observations is evidently much encouraged. This is excellent, and, in addition, this and other schools belonging to the Society of Friends publish a Natural History Magazine. This must be a great stimulus. It appears, too, that at Bootham a naturalist is held in honour, not merely tolerated as an amiable eccentric.

Apropos of the recording of observations, I may remark that the Marlborough Natural History Society sent only one exhibit, but that a valuable one to those who choose to study it, viz., the Annual Report of the Society, in which will be found good evidence that boys there are encouraged to observe and do observe.

Not many museums were represented by actual specimens, most being content to send photographs. Curators do not feel justified in running risks. But Stepney Borough Museum sent exhibits (*e.g.*, the model showing the interlocking of the barbs of feathers) which showed how zealously the curator has striven to make it a teaching museum. The same may be said of the specimens from the Eton Museum. But there was nothing to show that marine zoology is well represented in school museums, and yet such a blank is a very serious one.

IN-SCHOOL WORK.

The boys' work of which I have hitherto spoken has been done out of school. The exhibits sent in by the various elementary schools show that the authorities are alive to the importance of including natural-history lessons in their regular course. This is excellent; grammar, in comparison, is of little importance. But in-school lessons are not

enough, and it is satisfactory to see a photograph of the boys of St. Peter's National School, Stockport, out geologising. There are also photographs of school gardens, institutions the desirability of which no one but an over-burdened ratepayer would dream of disputing. Gardens ought to be accessible to all elementary schools. In towns it is difficult to find space, but the need is in proportion to the difficulty. Country schools have a natural botanical garden all round them. A town school has somehow to obtain a patch of ground and plant it, or else make what use it can of a neighbouring public garden. Flower pots and flower boxes are not to be despised, and, if teachers did their best to show what might be done with them, dwellers in small tenements might find their surroundings brightened through the application of knowledge obtained at school. In this connection we may mention the aquaria show by the Froebel Institute. It is terrible to think how many town boys have no notion what a tadpole is like!

Several agricultural colleges put in exhibits that showed that they were doing very good work, but want of space prevents me from enlarging upon them.

To sum up: this exhibition has called the attention of educators to the truth that books are not the sole machinery of education, that each human being should be urged to go out of doors and discover what no doubt has been known for years past, but is new to him—should, in fact, use his eyes, instead of getting his information second-hand. It will be long before this is generally realised by those for whom the lesson is most important, for many teachers have been suckled on books and nothing else, and they cannot be expected to change their notions all at once. No one is more difficult to educate than the educator. But it has now been emphatically proclaimed that if he is a mere bookman, he must make haste to be something more.

CONFERENCES AT THE NATURE-STUDY EXHIBITION.

By WILFRED MARK WEBB.

ONE of the points universally recognised by those who took part in the crowded conferences held in connection with the Nature Study Exhibition was that "nature-study" is to be regarded as a branch of education and should provide a training for all in their early years. Sir George Kekewich, for instance, said that the study of nature is just as essential for the scholar in a secondary as for one in an elementary school. In some ways it is even more essential, for it is absolutely necessary to a liberal education; the scholar can carry the study higher, making it a basis of scientific knowledge. Previously Professor Lloyd Morgan had characterised nature-study, not only as the stepping-stone

to science, but also as a means of literary and artistic culture. "Rob literature and art," said he, "of all that is the outcome of nature-study, and how incalculably the poorer must they appear."

Another conclusion arrived at by all those who felt called upon to speak of the aims of nature-study is that it is to encourage habits of investigation and enquiry upon the part of the pupils concerned, or, as Mr. Herbert Morrell put it, "a well-directed curiosity is at the bottom of it all."

A third consideration which should occupy attention is the opinion clearly expressed by a number of speakers, and by no means objected to by others, that nature can best be studied out of doors and most naturally if the attention is directed towards the products of the seasons. Professor J. Arthur Thomson was the chief exponent of these ideals which may seem to point towards heuristic methods; but the majority of speakers, it may be said, were decidedly against being bound down to any complete scheme of the kind, though fully admitting the value of letting the pupil do the work "upon occasions." Professor Miall spoke in favour of heuristic methods carried out in detail and even in the case of adult students. Many of his ways are recognised as excellent, but he found a host of opponents to his pet scheme and to his narrowing down of the subject of nature-study to something actually living, preferably a plant—"because the study of animals encourages cruelty"—without the help of any pictorial illustrations whatever.

A great deal was said about correlation; but Canon Steward, wisely quoting, said that "correlation for the sake of correlation should be avoided," and further gave his opinion that it can be, and is, very much exaggerated, especially when the legs of the bee and spider are dragged in to teach simple addition, and forms of plants are used as pegs on which to hang an elementary Euclid lesson. Mr. Rose, an elementary schoolmaster, who treated nature-study from the primary school point of view, similarly objected to correlation being carried too far.

The question of culture was touched upon several times, and although Mr. Sadler's paper was entitled "Nature Study as an Element of Culture," he took the last word rather to mean education. In this connection Lord Avebury's remarks upon education which does not include a knowledge of nature may aptly be given. He said:—

We have all met persons who have taken a university degree, and yet do not understand why the moon appears to change its form; who think corals are insects; whales, fish; and bats, birds; who do not realise that England has been over and over again below the sea; and still believe that the world is not more than 6,000 years old. It may be said that ignorance of these points does not directly affect life, but, at any rate, the ignorance of the simplest laws of health leads to most deplorable results. No doubt both Oxford and Cambridge have admirable science schools. A man can study there with many advantages and under excellent teachers, but the prizes and fellowships are still given mainly to classics and mathematics. Moreover, natural science is not yet regarded as a necessary part of education. Degrees are given there, and now, alas! even at the University of London, without requiring any knowledge of the world

in which we live. Our universities give excellent teaching, they prepare learned specialists, but are places of instruction rather than of education. The most profound classical scholar, if he knows nothing of science, is but a half-educated man, after all—a boy in a good elementary school has had a better education. The responsibility rests with the universities. The public schools tell us that they must conform to the requirements of the universities; the preparatory schools are governed by the public schools; thence the tendency to specialise the education of boys from the very beginning of school life.

The question of teachers is a vital one, and the training discussed related principally to those who are to teach, or are already occupied in elementary schools. The danger pointed out by Professor Thomson is that the teacher who deals with nature-study, instead of being organically, may only be coercively, interested in his work. Where real teaching from nature takes place in secondary schools at the present time it is almost certain to be due to enthusiasts, and these are the life of numerous school field-clubs. The urgent need for qualified inspectors for all kinds of schools was another point alluded to.

School museums and local museums as supplementary to out-door nature-study, and the useful school work in the class-room for which it forms a basis, were touched upon by Mr. Henry Hobhouse and Mr. H. Coates respectively.

Miss Gurney gave an account of the work of girls' secondary schools, as illustrated principally by those of the Girls' Public Day School Company. Mrs. Franklin rightly claimed that much good work in nature-study is the result of home influence. Among special subjects of interest in connection with nature-study work, "Trees" were discussed by Mr. John Evans, "Plant Life" by Mr. Scott Elliott, "Geology" by Professor Grenville Cole, "School Rambles" by Mr. J. H. Cowham, and "School Gardens" by Mr. T. G. Rooper. "The Relation of Nature-study to School Work and to the Home" occupied Sir Joshua Fitch. Dr. Bickmore, of New York Natural History Museum, gave demonstrations of his Methods of Visual Instruction. "The Teacher as an Observer" and his proper attitude were treated by Miss Mary Simpson and Principal Hall respectively, while the Work of Urban Schools was discussed by Mr. H. Major and that of County Councils by Mr. Macan.

Meaning of "Nature-study."—It would probably remove much perplexity if it were generally understood that when we speak of the study of nature we restrict the term "nature" to living things, plants, animals, insects, and their environment, to the exclusion of things that are lifeless. Again, the term "study" in this connection implies something more than mere passive observation. It signifies the attitude of mind of one who takes an intelligent and active part in the pursuit of a certain kind of knowledge, who "learns by doing," and does not rely solely on the second-hand information that may be derived from books and lectures.—A. G. Legard.

THE SCHOOLS' EXHIBIT AT THE CORK INTERNATIONAL EXHIBITION.

SOMEONE has cynically remarked that the chief function nowadays of an industrial exhibition is to form an excuse for *al fresco* entertainments. Time was when "the long laborious miles" of the Crystal Palace were acclaimed as the dawn of the golden age, when swords should be turned into the most modern reaping-machines, and each man "find his own in all men's good, and all men work in noble brotherhood." That millennial vision is still far away, and we have grown chillier. We no longer raise the song of praise because manufacturers of all nations send specimens of their work to a common centre in quest of medals. In France, according to Mark Twain, few men escape the Legion of Honour. Is there any artificial product that has escaped decoration at modern exhibitions? They all seem to end in a shower, if not of gold, of at least silver and bronze. At the Cork International Exhibition, however, the medals are still things of the future, and, though man has abundantly supplemented the attractions provided by nature, and has catered well and wisely for the wants of pleasure seekers, the main function of the exposition is neither medal-giving nor *fête*-giving. It is an industrial exhibition with an educational motive, intended to illustrate the industrial revival in Ireland, and, at the same time, to indicate the lines along which that movement may best advance. Whilst the whole Section organised by the Department of Agriculture and Technical Instruction for Ireland forms one vast object-lesson, the Schools' Exhibit furnishes an ocular demonstration, of peculiar interest, of the possible results of the application of science and art to the material resources of Ireland. The Department is the central authority for technical instruction in Ireland. The progress and success of its schemes depend upon the extent to which the people at large understand their exact object and appreciate the value of technical education in all its phases. Three objects, accordingly, have been aimed at in the Schools' Exhibit:

(1) To bring under the notice of committees, managers and teachers some of the results of technical instruction, showing as far as possible the material conditions under which that instruction is given, as well as specimens of the work done.

(2) To produce a living object-lesson of the kind of instruction in science and manual work in wood which is now given in Ireland in day secondary schools as part of the Department's first year's programme.

(3) To give an illustration of suitable equipment and apparatus, and to afford local authorities an opportunity of seeing the various kinds and qualities of apparatus, models, casts, &c., which educational-supply firms are now producing for the use of schools.

To attain the first aim, a collection of some of

the results of technical instruction in Ireland and elsewhere has been secured through the assistance of schools in Ireland, England, Scotland, Wales, Germany, Austria, Switzerland and Belgium. It should be mentioned here that, as a rule, no great effort has been made to secure a display of work or of photographs from Irish schools, for it would have been premature to hold up to public estimation the results of work so recently begun. An exception is, however, made in the case of schools of art, especially the Belfast Municipal Technical Institute, the Dublin Metropolitan School of Art, and the Cork School of Art. Moreover, throughout the exhibit may be found excellent photographs of Irish primary, secondary and technical schools and training colleges, and examples of work are shown from several Irish technical schools, including the Pembroke, Kevin Street (Dublin), Blackrock and Kingstown Technical Schools, &c.

In arranging the exhibited "works," the usual classification is adopted, the exhibits being grouped as far as practicable under the following heads:— (i.) *Primary Schools*, such as the National Schools of Ireland; (ii.) *Secondary Schools*, generally known in Ireland as Intermediate Schools; (iii.) *Technical Schools*, including Schools of Art and Domestic Economy Schools; and (iv.) *Training Colleges*.

The photographs and "works" exhibited have been arranged in some thirty divisions. The official catalogue contains a description of the contents of each division as well as an alphabetical index of each school, with cross-references to the stands and stalls, and Mr. Toppin, the Departmental official in charge of the Section, is always ready to give visitors any further information which they may require.

The exhibit from primary schools has been confined to views of school buildings and examples of hand-and-eye work, of drawing, and of manual instruction in wood and metal. Some very small rural schools are represented, *e.g.*, Corrie School, Isle of Arran, Scotland, as well as some of the largest schools to be found anywhere. The Album of the Leeds School Board, illustrating different phases of school life, forms an especially interesting exhibit, and many of the specimens of drawing and woodwork are very creditable. An interesting set of water-colour sketches of Irish primary schools of a century ago is shown on one of the screens, and some specimens of the modern work of the National Board of Education are exhibited. Occasionally there may be seen good examples of the co-ordination of the work of primary schools with that of evening classes or of technical schools, such as the exhibits from the Burslem School Board and the Wedgwood Institute, Burslem. The buildings erected by managers of voluntary schools in England, the counterpart of the denominational schools of Ireland, are shown by photos, those of St. Michael's and St. Mary's Schools, Newport, Monmouthshire, being of special interest.

Secondary schools are mainly represented by photographs of buildings and by examples of drawing and design, and of manual instruction in wood

and metal. The exhibits from Irish secondary schools consist chiefly of photographs and drawings, and, in some cases, of specimens of woodwork from schools where the Department's first year's course of manual instruction has been followed during the past year. The exhibit from the Christian Brothers' Schools, Cork, also illustrates a progressive system of handwork, consisting of complete courses in paperwork (for children of six or seven), brick-work, wire-work, cardboard modelling and stencilling. As regards English and Scotch schools, the examples of drawing and design from Arbroath High School and of wood-work and metal-work from Bablake School, Coventry, are particularly good, whilst the George Heriot Hospital School, Edinburgh, has sent a very complete exhibit.

An interesting feature of the Section is that many of the exhibits from both secondary and technical schools are accompanied by the drawings from which they were made, a fact which greatly increases the utility of the exhibit. Thus, the admiration a visitor naturally feels at the sight of the magnificent wrought-iron table-lamp, shown by the West Bromwich School of Art, is increased when he inspects the original design, for a comparison of it with the lamp enables him better to appreciate the educational value of such work.

The technical schools occupy most of the stalls, and photos of technical-school buildings are shown on the screens. It was not an easy matter to bring home to committees, managers, and teachers a mental picture of a first-class technical college. The photos from the Royal Salford Technical Institute and the diagrams and dimensioned plans of the German Technical High Schools in Brunswick and Hanover give, however, a good idea of buildings; whilst the varied character and high quality of the instruction is indicated by many of the exhibits, such as the designs of the Glasgow and West of Scotland Technical School for roof-truss, plate-girder, box-girder, and steel column; the splendid book of drawings from the Berlin Building Construction School; the electrical and horological apparatus of the Northampton Institute, London; the confectionery of the Borough Polytechnic, London; and the leather work of Herold's Institute.

Among so many good exhibits it is, perhaps, invidious to particularise, but, as regards Irish schools, the silver work and modelling from the Dublin Metropolitan School of Art, the wood-work and metal-work from the Pembroke and Kevin Street Technical Schools, the lace designs from Cork, and the textile work from Belfast are certainly deserving of note.

As regards English and Scotch exhibits, the London County Council's schools show some very beautiful specimens of metal-work, printing, illustrating, and bookbinding; whilst the pottery work from Hanley and Burslem, the cake ornamentation from the Borough Polytechnic, London, the stained glass from Glasgow, the bookbinding from the Acton and Chiswick Schools of Art, the enamelling from Birmingham, and the plumber's

work from several Scottish and English centres, have attracted much notice. Herold's Institute, Bermondsey, has sent a remarkable leather exhibit, showing raw hides in different stages of preparation, the various leathers made from ox-hide, and samples illustrating the staining and dyeing of leather.

Domestic Economy Schools and Training Colleges are represented mostly by photographs, but the Liverpool School of Cookery has also sent specimens of work and syllabuses which illustrate the development of domestic science education from 1837 to the present time.

Two excellent exhibits are shown by the Coventry Municipal Technical Institute, and the Clothworkers' Department of the Yorkshire College, Leeds. The former has sent specimens of ribbon-weaving by students, drafted and woven from their own designs, and the exhibit from the latter includes pattern-books containing dyed samples of woollen cloth and calico from the experimental dyehouse, a model of the dye-bath used for experimental dyeing, samples of wool in its natural condition, a selection of dyed samples showing a variety of fast colours, photographs of the Clothworkers' Textile Industries Department, notebooks illustrative of the lecture courses, examples of students' experimental work in spinning, weaving, and designs for textiles, &c.

The most striking feature of the Schools' Exhibit is one which is perhaps more of a commercial than an educational nature, viz., the boot-making section from the Crawford Technical Schools, Cork. Very elaborate boot-making machinery has been set up in the Main Hall, and is constantly worked by some twenty apprentices from the Crawford School, who carry out, before the eyes of the visitors, the complete craft of boot-making. Each boot takes about twenty minutes to complete, and in the process passes through some dozen hands.

With the second object in view, namely, to produce a living object-lesson of the kind of instruction in science and manual work in wood now given in Ireland in day secondary schools, as part of the Department's first year's programme, a full-size model laboratory of the composite type, completely equipped for twenty pupils, and a workshop similarly equipped for twenty boys engaged in manual work, have been fitted up and form the central features of the exhibit. The apparatus for the laboratory has been supplied by Messrs. Philip Harris and Co., at their own expense; the workshop benches have been supplied on loan by Messrs. Booth Brothers, of Dublin, and the tools have been purchased by the Department from the same firm.

In both the laboratory and workshop, demonstrations of part of the Department's programme are given three times a week by pupils of the Christian Brothers' School, Our Lady's Mount, Cork, under the general direction and supervision of the Rev. Brother J. D. Burke. These demonstrations take the form of practical work; thus, in the laboratory the boys may be required, for

instance, to determine the specific gravity of a certain substance. They carry out the operations in view of the visitors, and note down the results which they have obtained in their note books, which are then inspected. In the workshop, a plan is drawn of the work set in each demonstration. The boys then measure the wood according to the precise scale indicated, and carry out the operations required. An additional interest is given to the work by arranging the design so that whilst the work of each boy is complete in itself, it forms part of a larger object the production of which is dependent upon the accuracy of each. All these operations are carried out under the eyes of the visitors, and the presence of strangers does not seem in any way to distract the pupils, so great is the enthusiasm which they display in their work.

It is not surprising that these demonstrations have attracted much attention, and that they have proved one of the most popular features of the Exhibition. As the Right Hon. Horace Plunkett, Vice-president of the Department, remarked in a recent speech, "It is worth a journey to Cork to see the radiant benevolence of Brother Burke's countenance as he and his colleagues preside over his little band of youthful Irish students in the model school-workshop and school-laboratory. These lads may be seen there unravelling the elementary mysteries of science, and preparing to take part with trained hands and observant eyes in the work of a new Ireland."

The large collection of photographs of the interiors and exteriors of schools and plans of floors have been brought together in order that school authorities may see the character and design of school buildings, and may study the equipment of class rooms, laboratories, and workshops, and from measured drawings make notes for future use. With the object of helping committees in equipping their schools, the Department has brought together a complete exhibit of the apparatus, models, &c., which educational-supply firms are producing for the use of schools.

Very many of the exhibits are worthy of a detailed description, but probably enough has been already said to indicate how thoroughly the opportunity offered by the Cork Exhibition has been seized to bring home to the people of Ireland the methods and objects of the educational policy of the Department. All interested in education should see the exhibit, the most complete and interesting schools' exhibit that has been gathered together for many years.

THERE is a wide difference between what education is and what it should be. If every school and college throughout the country were closed to-morrow, it would probably effect some negative good within an appreciable measure of time, and it would certainly abolish much positive harm that is being unceasingly produced by the present methods of instruction. If no effort be made to develop the faculties of each individual, then it is better to leave them alone to develop on their own account.—Harold E. Gorst.

THE STUDY OF CHILDHOOD.¹

By P. A. BARNETT, M.A.

MANY of us are parents. Between alternations of admiration of our offspring and fear of them, we spend a good deal of time in providing for them. It may even be said (though people not parents may refuse to believe it) that very few but parents know what the possession of children costs, of what children are capable, and how much thought is necessary on their behalf. Mr. Herbert Spencer, austere philosophical, may well denounce parents for not preparing themselves for parental functions. He has reason. But the nature of things forces on us many tasks for which we have to fit ourselves *ex post facto*, so to speak; and even a philosopher who has no arrows in his own quiver may not forget that many practical and serviceable instincts come, like milk to the mother, to parents as such, whatever they read and to whatever societies they do not belong. Not a little of the Child Study so-called is apparently stimulated by the feeling that nothing can be predicated of children till it has been set out on squared paper; which is fortunately not true, for parents would else be in very bad case.

The report of the proceedings of the conference held by the British Child Study Association at Hampton Wick is full of suggestion, interspersed with some exceedingly debatable matter exemplifying both right and wrong ways of "studying" children. It is worth careful reading. Some of the Associated Students are themselves parents; and others of their number have such extensive and peculiar knowledge of the objects of their solicitude that when they speak we must, willy nilly, remove our fingers from our ears.

The Chairman, Sir James Crichton Brown, *magnam et venerabile nomen*, sounded the note of caution which we are accustomed to hear from him. There must be no forcing. Precocity, he tells us, where it is not a symptom of disease, is a sign of a low type of organisation. True; a potato cooked too quickly is a poor thing. But what we want to know is not merely that precocity is prematurity, but how to fix approximately the line that marks early and *unstable* development in human beings from development not too early to be *stable*. If human beings can arrive early at great powers and live the average term of life without physical or mental distress, then welcome early highly-organised development, Mr. Nordau and Sir James notwithstanding. To be sure, where physical or mental distress shows itself, the sensible trainer spares his oil and his toil, and goes easy. It is perfectly true that "high evolution is late evolution, and that as we ascend in the scale of being and of civilisation the period of dependence of offspring on parents is gradually lengthened out," but

¹ British Child Study Association. Proceedings at a Conference on Child Study held at Normansfield, Hampton Wick. 27 pp. (Street & Co.)

evolution is not high *because* it is late; and Sir James would surely not have us lengthen this period of dependence in the interests of "high evolution." And *what* is this period? Any one can pull his dial from his poke and say, It is twelve o'clock; but we want to know how to ascertain Greenwich time and to set our machinery by the sun.

Clearly, then, the study of childhood which Sir James demands is a very good thing; only let it not be forgotten that he wants it well-directed and classified. He insists that it must be serious; it must not convert trivialities into statistics; it must not merely collect curiosities. It is much to be wished that all who approach this delicate business should have some psychological training, and this rather for the purpose of learning how hard it is to make practicable inferences from psychological data than because they will get much direction from it. Sometimes the child-study paraded to the world is trivial, and sometimes it deals with ordinary cases as if they were abnormal. It is an undoubted fact that the observation of morbid cases throws most valuable light on the conditions of health as well as of disease; but the solitary and untrained enquirer tends to mistake the one for the other. Nor is it without significance the pre-occupation of many professed students-of-children that the Association held its meeting at an Institution devoted to the study of mental *defects*. In truth, the precedence given to "child-psychology" in the psychology sometimes set before teachers may be a serious nuisance. Before we come to the children, we ought certainly to learn what we can about the mental and moral processes of the healthy adult. No serious psychologist, for instance, would follow the amateur who sees indubitable warning of grown-up piggish gluttony in little Tommy because his eyes sparkle at sight of a currant-tart. (And now I come to think of it, Count Fosco was the only villain I ever heard of who liked fruit-tarts.) The road to Gehenna is paved with the hap-hazard psychologies of theologian students-of-children, to whom the child was mostly an adult de-moralised, and not merely an un-moralised person. As Mr. Holman most wisely suggests, often "in our infant schools, in our kindergarten methods, we are dealing with the normal children as though they were defective."

Child-study has a good case, but it is not made better by unsound argument. To have been a child and to have had children is of more service in this occupation than an encyclopædia of psychology. There is no parity between this reasoning and the argument propounded as parallel by a hasty speaker (*quam honoris causa nomino*) thus: "I have had eyes all my life and been familiar with the use of them, and therefore I know all about the eye." The eye is an organ directly employed to give us information, and rarely (in ordinary folk) looks at itself; children (goodness knows!) are perpetually scrutinised by their elders and have even been known to obtrude themselves on notice when propriety would have been satisfied on easier terms. We do not see our eyes, and we do see our children.

And the use of "self-consciousness" as equivalent to "consciousness" is hard to pardon.

When Dr. Kimmins calls down reprobation on the Heedless Parent, he says no more than is right. But one may fear that his child-study-in-the-home might possibly lead to fussy interference in some respects, and, in others, out of excessive fearfulness, deprive children of such discipline of effort as they can undergo. Why will not Dr. Kimmins "say one word in advocating the desirability of introducing anything in the form of regular instruction at an early age"? "Instruction," word or thing, is a sort of bogey; we are becoming hypnotised by it. You begin to "instruct" the babe that has strength enough to grab your extended finger. His regular meals are instructing him; Dr. Kimmins knows that it is well worth while to discipline an infant to regular feeding times; and that is instruction. Hear Sir James Crichton Brown himself on this point. *The first moment of life is the most instructive of any when it is under the control of a series of successive agencies.* Herbart himself could not have stated more positively his opinion that there is no education without instruction. Instruct as much as you like on this side of physical or mental distress.

Mr. Holman hits a nail on the head. "The ordinary activities of the child will at least supply sufficient data for all the great and broad and substantial investigations that we must first make." So far as Child-Study has results to show, it has produced them by work that might have been set forth in the *Novum Organon*; its sole drawback is that it cannot use the methods of crucial experiment. It is a dangerous thing to play with souls, "conscious" or "self-conscious." But unostentatious accumulation and careful scrutiny of plain facts may help the honest empiricist considerably. The admirable investigations of Mr. Hall and Professor Earl Barnes, though they do not perhaps tell us much that wise teachers have not divined, certainly help to fortify them in their work.

To put the case in a nutshell, Child-Study, if it is to be profitable, must conform to scientific standards; it must not be treated as if it were a trick or new "method." First: a real psychological training is necessary. A smattering of psychology imposes on the unwary victim the illusion that he can proceed deductively; and he straightway makes unwarrantable inferences from what he thinks he sees. Next: observations must cover a large ground. They must be observations of many children. *Enumeratio simplex* calls for a multitude of particulars. If the observer is pre-occupied with but one or a few children, he is certain to be misled into conclusions on too slight a basis. He will not know how many of the phenomena which he chronicles are common to children, and how many (if any) are abnormal. He will not see the wood for the trees. Finally: observations must not only cover a large ground, but they must also be checked by close observation of some individual children apart from the crowd. The observer will otherwise attribute to every child what may be common but not universal, nor even general. He will not see the trees for the wood.

TWO SCIENCE-BOOKS FOR THE LIBRARY.

DR. THORPE'S volume¹ of historical essays is very welcome on two grounds. First, because the essays themselves are delightful; secondly, because the historical side of chemistry has been much neglected in schools, where it has been crowded out by the demands of examination syllabuses, and because their appearance enables us to draw attention to this neglect, and at the same time to recommend a really readable book well fitted to the powers of the more interested boys, admirably suited for use as a prize-book, and sure to be in great demand in the library. School librarians, we know, are apt to look askance at science books—"They so soon get out of date." This is a science book which will not get out of date.

Dr. Thorpe is deeply interested in the group of great thinkers and workers who founded modern chemistry, and accordingly his volume opens with six essays in which he brings vividly before us the picturesque figures of Boyle, Priestley, Scheele, Cavendish, Watt the engineer, who was also one of the fathers of chemistry, and Lavoisier, who perished in the French Revolution. These are followed immediately by a reprint of his celebrated address to the Chemical Section of the British Association in 1890 on the subject of M. Berthelot's book, "La Révolution Chémique," in which that eminent chemist had claimed for Lavoisier a greater share in the discoveries which dignified the latter part of the eighteenth century than was generous or even fair to our eminent fellow-countrymen, Priestley, Cavendish and James Watt. In the subsequent essays Dr. Thorpe discourses on Faraday, Graham, Wöhler, the discoverer of aluminium, and the lifelong friend of Liebig; on the early struggles and subsequent successes of Dumas, on the work of Kopp, Victor Meyer and Cannizzaro, and on that of Dmitri Ivanowitch Mendeleeff, the great Russian chemist whose heroic mother—the mother of seventeen children—finding herself suddenly charged with the duty of providing for a disabled husband and her large family, established a glass works at Tobolsk, and managed it with such success that, after starting her elder children, she was still able to give Dmitri, the youngest and greatest, the advantage of an education at the University of St. Petersburg.

This book will delight all who study chemistry seriously. They may not learn many new facts, but they will do better. They will learn that to read a text-book or even to repeat other people's experiments is not to be a chemist. We hope that many of Dr. Thorpe's readers will not only learn the true road, but follow it.

The second book² under notice belongs to a very

different type. It is a book for the student who has already made some progress, and is sufficiently advanced to be ready to follow the latest attempts to carry forward the work of the great men whose lives and labours are the theme of Dr. Thorpe's volume.

The reader who is accustomed to the rather strict division of modern chemical books into those which are descriptive, and those which treat of chemical theory, may be a little surprised at first to find much in Dr. Ostwald's book that is familiar to every one who is ready to study such a work as that now before us. But it must be remembered that the author's object is not simply to convey information, nor even to bring forward a new theory, but rather to familiarise his readers with the new ideas about the nature of chemical reactions and with the language in which these are expressed, and with the application of these ideas and of this terminology to facts which have long been familiar. It will then be seen that the book is wisely constructed for its purpose of making more familiar to many the results of the labours of Horstmann, Willard Gibbs, van't Hoff, Arrhenius and, we may add, of Ostwald, in relaying the foundations of chemistry.

Dr. Ostwald's book will be most helpful to those who need a systematic treatise on pure chemistry on modern lines, and to those who are anxious to re-study the data of chemistry with the aid of the conceptions that have been introduced into the subject by the modern physical chemists.

W. A. S.

SEVEN ROMAN STATESMEN.¹

SINCE Plutarch, we know the value of the biographical treatment of history, and there is need to remind scholars and students that great men count for much in the world, especially in such periods of change and chaos as the last years of the Roman Republic. Mr. Oman here attempts to show the effect of the men named below on the history of their country; he certainly succeeds in producing a definite impression both of personality and of achievement (or failure) in each case. Whether the picture be true or not, it is something to have such an impression; it helps the memory wonderfully, and appeals to the sympathy as well as the intellect. It is, perhaps, not greatly to be regretted that all the sketches appear to be crude, one might almost say impressionist; for, we take it, the book is addressed to our old friends in the "higher forms of schools," or the general reader (so we should infer both from notes and style), and these would not appreciate delicacy of touch. There is no mistaking the picture of Tib. Gracchus as a fanatic, whose ends were foolish and unstatesmanlike, and his

¹ "Essays in Historical Chemistry." By T. E. Thorpe, C.B., LL.D., F.R.S. 522 pp. (Macmillan.) 12s. net.

² "The Principles of Inorganic Chemistry." By Wilhelm Ostwald; translated by A. Findlay, M.A. 768 pp. (Macmillan.) 15s. net.

¹ "Seven Roman Statesmen of the Later Republic." The Gracchi, Sulla, Crassus, Cato, Pompey, Cesar. By Charles Oman, M.A. With Portraits and Illustrations. (Arnold.) 348 pp. 6s.

"means worse than his ends;" of Caius Gracchus, more ambitious and revengeful than patriotic; and of their mother, who appears as a terrible prig. So with the rest: all are distinct, but all are in some degree exaggerated, or the more delicate shades in their characters elude Mr. Oman. He is happiest with Sulla, whose picture seems to us to be very truthfully drawn. Crassus, who by most readers of histories is remembered by his greed and his last overthrow, is shown to have been a man of considerable military capacity who failed because somebody had to fail before Romans could defeat Parthians; he is shown to have been prince of wire-pullers, his money-getting only a means to that end. Pompey's honesty, his real capacity and his limitations, all are well brought out. Cato comes out as the most creditable picture in the gallery, and Cæsar is the worst. Poor Cæsar! Mr. Oman will have none of Cæsar; he is only magnanimous because that suits his purpose; he is a great military genius, it is true, but his real part is the mob-leader and Mohock. Amongst his other pertinent parallels from later days, Mr. Oman might have remembered Henry V.

We have said enough to show that Mr. Oman is not an ideal biographer. We must now call attention to his faults of style. We regret to see a lack of good taste which leads him now and then to make a foolish joke (just suited to the "upper forms of schools") and to use flippant colloquialisms, or even American slang ("platforms" and "planks" are out of place in the Forum; "squatter" may pass as really a different thing from "settler," but what are we to say of "guerilla" (p. 253) for a partisan soldier? The daily papers, we know, have been calling the Boers "guerillas," but that really might be left to the daily papers. Then the allusive epithet is as common here as in Ovid; the whole book is overloaded with epithets. Mr. Oman frequently repeats himself, almost in the same words (compare pages 189 with 264, 118 with 122, 114 with 123). The brief introduction and one short chapter interposed show that the book is meant to be read continuously. With constitutional questions Mr. Oman is more at home; his accounts of the real effect of the Gracchan legislation and of Sulla's reforms are excellent. But the book is interesting for all its faults; and may be cordially recommended to the general reader and the higher forms of schools.

Schoolmastering.—There is no profession which is so apt, if exercised faithfully, sympathetically, and tenderly, to broaden the character and enlarge the spirit. A man who goes to be a schoolmaster with the expectation of having to discharge prescribed duties and afterwards to fill his leisure time as cheerfully as he may suddenly wakes up to find himself in the grip of all kinds of problems; he finds himself bound, like Gulliver, with all kinds of Lilliputian chains. The little people, who seem at first sight to be all so much alike in tastes and character, he realises are human beings with hearts and idiosyncrasies.—A. C. Benson.

THE TEACHING OF HISTORY.¹

THIS volume in the "American Teachers' Series," edited by Dr. James E. Russell, of Columbia University, is a further addition to the large number of pedagogical treatises made in America which the British teacher cannot well do without. It has the advantage of being written by a single author on uniform lines, and being equipped with good, select, up-to-date bibliographies. These bibliographies, like the rest of the book, deal with ancient as well as modern history; and, though they do not contain prices, they usually give the names of both the American and the British publisher.

Professor Bourne divides his work into two parts of almost exactly equal length. The first deals with the "Study and Teaching of History," the second with the "Course of Study." The latter part is likely to be less useful here than in the United States, for it assumes the existence of what we have not yet attained here, a definite but flexible course of study in history, correlated with other subjects. Still it contains useful book-lists and hints on special periods which will help the man in the British class-room; and it is one of the growing number of books to which the syllabus-framer of the future may profitably turn for suggestions.

The first part of Professor Bourne's work, on the other hand, is almost everywhere of direct practical value to the class teacher. After sketching the different conceptions of history which have prevailed at different periods, he turns to consider how the subject is used as an instrument of education in France, Germany, and the United States. Not until he has laid his foundation in this review of the actual practice of the past and the present in the study and teaching of history does he turn to consider the value of history. Then he gives an extremely wise and temperate chapter on the aim of teaching civics, sketches an ideal programme in history, points out the kind of facts which are most useful for school purposes, and the kind of books where they may best be studied, and describes the different so-called methods of teaching history, concluding with a chapter on the source-method. Here Prof. Bourne seems to us to strike the just mean between those who cling to the dull, old delusion that it is possible to learn history by getting up a condensed text-book, and those who cherish the charming illusion that if you fling a child into a library of "sources," or plant him in front of a "source-book," he will emerge a trained historian. A short extract from this chapter will illustrate the general sanity of Prof. Bourne's book: "Teaching history is, after all, a work of interpretation. Its aim is to reveal to the pupils a world of which they possess only scattered and vague impressions. . . . The shortest route to the historical attitude of mind is, therefore, not

¹ "The Teaching of History and Civics in the Elementary and the Secondary School," By Henry E. Bourne, B.A., B.D. x+335 pp. (Longmans.) 5s. net.

the source-method—although this may be a means: it is by reading the great masters of historical interpretation, the creators of modern historical literature."

PRINCIPLES OF CLASS TEACHING.¹

THIS is really a book to be read. It abounds in evidence of much learning (notified, mostly, in a thoroughly inartistic way, by foot-notes); it is often wise (sometimes with a gravity that suggests eggs and one's grandmother); it is not without wit (often successfully disguised in a style derived partly from Jena and partly from Chicago); and, without any qualification, it is sincere and honest always, the fruit of a fine enthusiastic spirit.

It is safe to say that Mr. Findlay has let nothing in the pedagogic way pass his gates without taking toll of it; and, as he insists, his new-fangled notions, which may strike the stay-at-home teacher as "mere theory," are in almost every detail operating somewhere between China and Peru, and right under Mr. Findlay's interested school-mastering eye whenever it surveys mankind. This is indeed a great recommendation. In matters of education we are generally much given to speaking all at once and listening to no one; but Mr. Findlay carries his scruples so far that, philosopher as he is, he has a good word for the humble folk who "have hitherto adopted methods of exposition which are frankly empirical." His method differs from theirs in its endeavour, not always unsuccessful, to bring the principles of class teaching into system. It is no fault of his if his systematisation is unlikely to commend itself as a whole to everybody; and it is very much to his credit (if a layman may be heard in court) that his chapter of "maxims" and his chapter of "hints," just as if he were himself a mere empiricist, are the best in his book. Indeed, the wise teacher will probably disregard his "system" and his technical terms, and, noting rather the sound sense of his practical views, without regard to their place in the hierarchy of psychology or what not, will try to catch something of his hopeful, energetic temper.

He rightly leads off with a definition, or rather a description, of education, which, accurate but wordy, gives the keynote of Mr. Findlay's music throughout. He tells us under what best conditions the class-teacher influences his pupil for his pupil's good. He adopts the familiar German division of his subject into Aim, Control, and Practice of Education, and, while professing to deal and actually dealing in the main with the last, has a good deal to say *en parenthèse*—no, in foot-notes and other spasms—on the two former. When we get him on to Curriculum, and so long as he is clear of technical terms, Culture Epochs,

Demands, Pleas, Apperception, and so forth, he is full of suggestion. For instance, his chapter on differentiation is a comparatively clear examination of the vexed question of the grading of schools, practical and sensible. When he begins to lay down Curriculum for each period of scholarship, we must be patient with him awhile. He is not a Froebelian *enragé*; and yet it is to be feared that his cossetting Infant Training, with its bogey fear of "results," would produce prigs and neurotics—only that most children decline to be made ridiculous. He himself, at this stage of his work, deals with an Abstract Child (how very like measles are capital letters and notes of exclamation!), and not with the perverse imps so dear and familiar.

Let every bit of knowledge be put to use. [A prescription which leads to endless futile fuss and worrying at the obvious.] *He [the infant] hears a story, and burns to tell it again: if he tells it and omits a single thread, how quickly the rest will pounce upon him! Then he will act the story, and sing a song about it.* [Fancy that! as they say in Scandinavia.] *He will paint a picture of the flower that was carried by the beautiful fairy, and he will search for the flower in the garden, learning all he can about its root and its leaves. While doing this he will commence arithmetic, for there are six petals, and it is better to count in petals to-day and in bricks to-morrow rather than to turn the fingers into a counting machine. . . . Delay the "common school subjects"—reading, writing, arithmetic, much longer than is customary. They are not native spontaneous interests to the child: they are acquired interests, just as much as a taste for beer is an acquired taste. . . . For all necessary uses, either in equipment or culture, the child does not yet require skill in reading, writing, or arithmetic. . . . On the famous hill-side in Thuringen, where Froebel first thought of the happy title "Kindergarten," there are no stoves or glass houses, but the winds of the mountains, the summer sun, the winter frost, all play their part in the gardens where child and flower bloom side by side.*

Or we may choose a song, "The Snow-bell," which can be acted as a kindergarten "game."

*Little white snowdrop
just waking up.*

The bell of the snowdrop is the signal which rings to wake up all the other flowers of spring-time.

The last citation is, indeed, a type of the laboriously sentimental manufacture of irrational associations, which, if they are not positively pernicious and in the truest sense "unscientific," are certainly no more useful than the three R's., even in a Kindergarten. The whole chapter in which these passages occur is less distinguished for good sense than any other in the book.

When we have safely accompanied the author out of the Children's Garden (for it is certainly not a Child Garden), it is hard to disagree with him. He writes no more like a German Kindergärtnerin, but like an English schoolmaster and a philosopher. Thereafter, if no account is made of his technical terms, he is all profit to the reader. Perhaps he is most suggestive in his treatment of Time Tables, which shows that he has done difficult things, *per ardua ad astra*.

¹ "Principles of Class Teaching." By J. J. Findlay. 435 pp. (Macmillan.) 5s.

We cannot part with Mr. Findlay without wishing him a better style and more English. He will say "commence" when he means "begin"; he occupies, or "admits," or "adopts" innumerable "stand-points"; once, at least, he positively speaks of "Robinson," and means not Leech's Robinson, but Defoe's Crusoe, if you please, who has been degraded to become a "type" for German pedagogy. To what base uses . . . ! Yet, with all its faults, and they are hard to bear, Mr. Findlay's book is a real book. It is laboured; it is long; it has no distinction of manner; but it is full of meat. The "educationist," if he reads it, will read it only once, and he will say in his heart There is no Pedagogy; but teachers who are keen will read it twice, and be twice blessed.

THE ADVANTAGES AND DISADVANTAGES OF HOLIDAY COURSES.¹

By J. W. LONGSDON, M.A.
Surrey County Council Schools.

HOLIDAY courses for teachers, in whatever subject they may be held, are at present, both as regards their origin and their practice, little more than a makeshift. They belong to a transitional period. During recent years somewhat sudden and unexpected demands have been made upon the teacher—demands which he cannot meet without further study. To qualify himself for the additional task he has only the school holidays in which to work. So we find that a man or woman who desires to fill up a gap in his or her mental equipment can nowadays find a holiday course in whatever subject he or she may desire.

But it is of courses for teachers in modern foreign languages, and particularly in the French tongue, that it is proposed here to treat. Some ten years ago the slow but sure movement of the protest against the grammar-and-dictionary method of dealing with a modern foreign language had gained enough force to make the English-bred French-master stir uneasily in his seat and ask himself if he ought not to know something of the country the language of which he professed to teach. It is an unquestioned fact that ten years ago the French master in the majority of smaller middle-class schools did not—if he were an Englishman—possess any knowledge of French life; nor did he attempt to deal with his subject as with a living language. For him the establishment of holiday courses in French towns was, and is, a distinct boon. It is not easy to find statistics on this subject, but I feel sure it will be no exaggeration to say that during the last eight years at least 2,000 teachers of French have visited these holiday courses—teachers who, or most of whom, at any rate, would, but for the opportunities thus offered, have remained in almost complete ignorance of the life of the French nation.

This may seem too sweeping a condemnation of our teachers of French. I am speaking of the smaller middle-class schools. It is, of course, obvious that, especially in the larger or richer schools, these criticisms do not apply. Nowadays a well-educated man must have some acquaintance at least with French. It is a misfortune that the term "well-educated" is not everywhere deserved among teachers. I will give one example of ignorance, and I assure you that the case is by no means exceptional. Some eight years ago I visited a country

grammar-school. I heard the French master give a lesson. The boys translated a French reading book into English, but did not read the French aloud. When the translation was ended, the master proceeded to ask grammar questions on the piece read. This was the form they took:—

QUESTION: What does the second word in the first line come from?

ANSWER: *v, o, i, r.*

Q.: What is the future of *v, o, i, r*?

A.: *V, e, r, r, a, i.*

Not a single word of French was heard throughout the whole lesson. It is true that on a subsequent occasion the master so far forgot his timidity as to pronounce a French word in my hearing. He asked me some questions about the word he called "koik" (*quoique*). Fortunately it was written on the blackboard, so I was able to grasp his meaning. That man, I regret to say, is still teaching French, and he has not been to a holiday course. So there is still occasion for further effort on the part of the committees of management to spread more widely their beneficent net.

We are all agreed that the proper way to teach a modern language to young beginners is to train the ear to understand and the tongue to repeat the foreign sounds, to train the eye to associate the visible object or its pictorial representation with the spoken word, and to train the mind to think in the foreign language. And most of us know that the chief hindrance to the introduction of an oral method is the want of teachers who have a sufficiently fluent acquaintance with the language. The difficulty is felt none the less keenly in a larger school with one qualified French master. There seems to be a tradition amongst headmasters that any man can take lower-form French. And the lower-form master himself has no objection to this; but he will not take sixth-form or even fifth-form French composition. Consequently the French master has to give all his time to the higher classes, watching with sorrow the evil methods of his colleagues, but knowing the impossibility of urging reform upon men who have had no opportunity of hearing or speaking the foreign language. That children should understand and speak within the limits of a simple vocabulary is the first object to be aimed at. Those who teach beginners must, therefore, be able to speak the language in question.

Let me give two more instances to show the need of reform. A teacher known to me who prepares boys for examination in what is called French conversation strictly impresses this piece of advice. Make up your mind in English what you are going to reply to the examiner's question, and then translate it into French. So the examiner watches and waits with eager intensity while the candidate forms with his lips the English phrase, and painfully brings it out word by word in something that he hopes is French. In a school I once visited I found two periods a week given to French conversation. This was how it was worked. The girls had a book of phrases, English and French in adjacent columns. A page of these was learnt by heart as preparation. The books were then closed and the mistress read a phrase in English, and expected the corresponding French phrase in reply. I was assured, in all seriousness, that owing to the stupidity of the girls this was the only practical method of teaching French conversation.

I have said enough to show that in my opinion a large number of teachers of French have an insufficient acquaintance with the spoken language, and therefore that they should be encouraged to go to France for the holidays at least, if they cannot afford to do so for a longer period of time. Holiday courses, though a temporary expedient, do perform a most useful and necessary work. I would not have it thought that I am guilty of exaggeration. I am not ignorant of the very considerable progress that has of recent years been made in the efficiency of modern-language teaching—a progress towards

¹ Abridged from a paper read at the Conference of the Teachers' Guild held at the College of Preceptors in January, 1902.

which the holiday courses have themselves contributed. The man who to-day applies for the post of French master must show that he has made some serious study of the language, and that he has spent some time abroad. But in my criticism I have in mind two sorts of masters—those who were appointed before the present conditions were exacted and those who are appointed as general-subject masters, and who teach French without having special qualifications for so doing. When I repeat that even to-day there are numbers of teachers in middle-class schools who are not conversant with and yet have to teach the French language, I am simply stating a fact within my own knowledge.

We are agreed, then, that holiday courses are a necessity. How far, we may then consider, do the holiday courses in the French language now existing meet the reasonable demands of the students attending them? There are, it were idle to blink the fact, shortcomings in the present system of organisation and control. From the discussion that will follow it may be hoped that the committee of management may receive many useful hints. Should the final control be vested in a French committee or in an English one? How far should the time of the students be occupied with classes and lectures? How is it best possible to secure opportunities for conversation in French? How far, if at all, can English conversation be prevented or prohibited? These are some of the points on which we should like criticism and helpful suggestion.

Putting aside the case of the man—or woman—who can spend a year or more abroad, let us consider the possibilities for the teacher who has only the holidays at his disposal. He has these alternatives. He may live in an hotel. In this case, unless he has an exceptional faculty for making acquaintance, he will get scarcely any opportunity of speaking in the foreign language; and none at all unless he already possess a certain fluency. The Frenchman, whether he be *table d'hôte* or *café* acquaintance, whether he be hotel porter or shopkeeper, will not long listen to the halting words of the beginner in French before he replies to him in English. For a man yet unused to French conversation this first method is almost entirely unproductive. The second plan is to live in a boarding-house. Of these there are plenty. But except in the rare case where a friendship may be made with a son or daughter of the family who has some leisure, life in a boarding-house is even less productive of good than life in an hotel or *café*. The third course open to the teacher is to live as the only guest, or as one of two or three guests, in a French family. Find your ideal French family, and this is the ideal method of spending your holiday from the point of view of the language. These are the essential conditions. The members of the family must be pleasant and willing to talk. They must have some leisure and must take trouble for the entertainment of their guest. They must introduce him into society, and take him about to theatres, and the like. If one can get a personal introduction to such a family all is well. But, for the most part, people are not willing to run the risk of having a disagreeable visitor for the sake of the few weekly francs of profit that can be made. The family willing to take the guest for the sake of the money is not usually able to give the advantages that are required.

I come to the conclusion, therefore, that the teacher who wants to spend his holiday in studying French had best join a holiday course. The objection—frequently raised—that the very number of the English people who are thus associated militates against the opportunities of speaking French is an unsound one. The facts are entirely the other way. Let us consider what the facts, as I take them to be, really are. The expected arrival of some fifty or hundred English visitors produces a certain pleasurable feeling of interest and excitement. The town, or that section of it concerned, is in a

hospitable mood. The inhabitants are prepared to show themselves and their city to the best advantage. Families which in ordinary circumstances would never think of taking boarders will gladly receive members of the party as paying guests. Excursions, conferences and entertainments are organised. A fillip is given to social activities. This is largely the result of the very numbers that some critics urge as a disadvantage.

In a holiday course there will be naturally lectures and classes. These may be and sometimes are exceedingly dull. It is not easy to find an interesting lecturer at every street-corner; nor it is easy for a man to make himself interesting when he is talking to an audience only partly familiar with his language. But even taking the gloomiest view—and the reality is often quite cheerful—the time-table provides that the student may listen to or talk French for three hours on five mornings a week. Add to this two hours of conversation at meal-times, for the Frenchman loves to sit and chat over his wine or coffee, and the student may have five hours of French a day. This estimate is, of course, the minimum. But the man who travels alone will not get anything like five hours a day in which he can listen to and speak the foreign tongue. And besides this minimum of five hours the eager student can readily get two or three more. Myself I would be no martinet. The effort of listening to an unfamiliar language is no small one; and the recreation of a little conversation with one's fellow-countrymen is, in my opinion, quite permissible.

But it is essential that the members of the course should prepare themselves to make the best use of their time. The subject-matter of the lectures must be studied beforehand. Continued reading and writing must go along with the conversation. The way in which most Englishmen have applied themselves to language-study tends to make them distrust the evidence of their own ears. A word or phrase must be seen in print and its construction understood before it can be safely used. Therefore vocabulary must be acquired from books. The student who comes prepared and tries to make good use of his opportunities will not go away disappointed. The man who has never had any French speaking will seem to gain but little fluency from his first month; but he will, at any rate, have some first-hand knowledge of the French people; and if he persists for a second visit his progress will probably surprise him. Some precautions, of course, are necessary.

As to the control of the holiday courses, it is best, in my opinion, to leave as much as possible to a French committee of management. Each year makes this easier, as the requirements of English students become better understood. In reply to the criticism that the courses are not serious enough, I would say this: in the holidays no teacher ought to be asked to study for more than four or five hours a day at the most.

There are, it is true, certain disadvantages connected with holiday courses; but—except in rare cases—these disadvantages are still more strongly felt by teachers who adopt any of the alternative methods of spending their holidays in France. The advantages of holiday courses are certainly appreciated by a large number of teachers, both men and women. I have one word more. I have spoken of holiday courses as a temporary expedient. It is true that they are so. But under slightly altered conditions they may, and I hope will, become permanent. The French teacher of the immediate future will no doubt prepare himself for his work by a prolonged residence abroad. But nothing is lost more easily than fluency in speech and purity in accent. For all teachers of French, periodical visits to France are a necessity, and when the present temporary and elementary character of the gatherings has been changed, there will still exist a wide and useful field of work for the organisers of holiday courses in France, Germany, Spain and Italy.

POPULAR ERRORS IN METEOROLOGY AND GEOGRAPHY.¹

Forests and Rainfall.—An example of the persistence of error is the idea that the presence or absence of forests has an influence upon the amount of rainfall. Some keen observer long ago detected the fact that forested regions enjoyed a heavier rainfall than those not forested, and jumped to the conclusion that rainfall was produced by forests, and, as a corollary, that the removal of forests diminished the rainfall. Looking over the earth he found many treeless, desert, and semi-desert regions, and forthwith instanced them as frightful examples of the result of man's wastefulness in destroying the forests. Prominent among these examples are the shores of the Mediterranean, including the Iberian Peninsula, Italy, northern Africa, and Syria, which are often quoted as favourite illustrations of man's destruction of climate by his destruction of the forests.

In reply to this charge man can certainly plead not guilty. If his accusers had possessed a little more knowledge of the causes of climate and the conditions which modify it, they would have seen at once that the geography of this Mediterranean region, the present configuration of the land and water, and the prevailing winds are such as to give it a light rainfall—forests or no forests. Furthermore, a knowledge of physiography would have taught them, in corroboration of the above, that the arid or semi-arid conditions now existing must have existed for many thousands, if not millions, of years, for the mountains, cliffs, and canyons are such as are carved only in arid regions, are not those of a moist climate, and these forms have not been made in a day. The situation is simply that the cart has been placed before the horse. Want of rain prevents the growth of trees; want of trees does not prevent rain. This position is generally accepted among physical geographers, but the majority of the people still reverse cause and effect.

Forests and Floods.—A persistent, widespread, and well-rooted error is the belief that floods in American rivers are greater and more frequent than formerly, and that this is due to the removal of forests from their drainage areas. Every great flood induces another flood of editorial paragraphs in the newspapers to the effect that man, by clearing away forests, has increased the flood height of streams, and correspondingly diminished the low water-flow.

It is probable, although it has not been proved, that the clearing of land by cutting away the forests and undergrowth does alter the regimen of streams, increasing their flood height and diminishing the flow at low stages. In other words, water probably runs or evaporates more rapidly from bare ground than from ground which is covered with trees or other forms of vegetation. But where the forests are cut away the land is seldom left bare; it is cultivated, or quickly becomes covered with bushes, which hold the water quite as effectively as forests.

The main fact, however, is that the floods in American rivers are no greater or more frequent now than in the past. The Ohio River, for instance, has been gauged continuously for many years, and these gaugings show no appreciable change in regimen, whatever changes may have been made in the forest cover of its basin.

Formation of Fiords.—In the school geographies we are taught that the fiords of the coast of Norway, those deep gorges partly filled by the sea, are proof that the coast has been sinking. How could such canyons be cut, it is asked, unless at the time of their construction they were above sea level? But to-day, on the coast of Alaska, we see just such canyons in course of construction below sea level. On this coast are scores of glaciers

travelling in gorges, which near their lower ends are many hundred feet below the level of the sea. The Muir Glacier, where its front meets the sea, is over eight hundred feet thick, six hundred feet of which is below the level of the water, and this, like all other glaciers, is constantly carving its bed deeper. The Norwegian fiords were cut by glaciers, and, probably, while the sea and land were at the same respective levels. The coast of Norway may be sinking, but its fiords are not evidence of it.

Climate and Ocean Currents.—Other familiar errors concern climate still more directly. The well-known mild climate of the northwest coast of America is commonly attributed to the balmy influences brought to it by the Japan Current; the Gulf Stream is supposed to have the same influence upon the west coast of Europe, and the cold climate of the east coast of the United States is attributed to the supposed current from the Arctic Ocean hugging this coast.

That these explanations do not explain will be realised after reflection. Can it be supposed that the Japan Current, however warm it may be when it leaves the Tropics, retains any appreciable excess of heat after a journey of six thousand miles in northern latitudes? As a matter of fact, no trace of this current reaches the shores of North America, its force being entirely lost thousands of miles to the westward. There is nothing left but the merest drift of the surface water before the prevalent west wind.

In the North Atlantic the condition is much the same. The Gulf Stream loses its velocity and disappears as a current long before the British Isles are reached. That the cold climate of the eastern coast of the United States is caused by an Arctic current close inshore is disproved by the fact that there is no such current along this coast.

Winds and Ocean Currents.—There is probably no phenomenon connected with the physical life of the earth which has been the object of greater misconceptions than the currents of the sea. The maps of the school books are covered with lines and arrows, indicating currents in every conceivable direction, every temporary drift of surface water reported by navigators having apparently been recorded as a current.

The system of oceanic currents is very simple: a drift of water towards the equator, a current along it flowing westward to the land, there dividing, flowing north and south, and dispersing.

This equatorial current has been attributed in the text-books to a variety of causes. The unequal heating of sea water in different latitudes is a favourite explanation. This, however, could produce currents only by changing the volume of the heated water, and, unfortunately, if the water under the equator were appreciably expanded by heat, it would cause currents in the opposite direction from those which exist; we should find them flowing away from the equator instead of toward it.

Another explanation given is the increased evaporation in the Tropics, thus lowering the surface of the water and causing an inflow from north and south. Were this of any appreciable magnitude it would undoubtedly cause a drift of water to equatorial regions, but there would be no corresponding outflow, such as the Gulf Stream and Japan Current.

A third cause assigned is the diminution of atmospheric pressure on the sea in the Tropics, produced by the heating of the atmosphere and its consequent rarefaction. This amounts to a fraction of an inch in the barometric column, and is, therefore, a small matter. Undoubtedly, if it had an appreciable effect upon the sea, this effect would take the form of a slight flow of water towards the equator; but, when equilibrium was thus established, there would be no further flow toward the equator; nor would there be any flow at all away from it.

Still another cause assigned is the increase in density of the water under the equator, due to excessive evaporation, thus

¹ From a paper by Mr. Henry Gannett in the *Bulletin of the American Geographical Society*, vol. xxxiii., p. 259.

increasing the saltness of the water. It is difficult to see what effect would thus be produced were it appreciable.

The true cause of the ocean currents is sometimes mentioned in the text-books; but excepting in two of the most recent ones, is given little or no prominence. The initial cause is the trade winds. Those blowing constantly from the northeast and southeast induce a drift of the surface water in their directions. These two drifts meeting near the equator flow along it westwardly, developing into a well-defined equatorial current. In the Atlantic this current, after flowing across the ocean, impinges on Cape St. Roque, Brazil, where it divides. The smaller part turns southward and skirts the coast of South America, fading out near the latitude of Cape Horn. The northern and much the larger part flows through the Caribbean Sea and the Gulf of Mexico, gathering strength and momentum in the narrow passages through which it is forced by the body of water behind it, and enters the Atlantic through the Straits of Florida. Here in the open sea it rapidly widens, shallows, and loses its velocity, and in the middle Atlantic is reduced to a mere drift, gradually turning southward to repeat its long journey.

What takes place in the Atlantic takes place on a much larger scale in the Pacific. From all parts of that great ocean within the Tropics the surface water is driven to the neighbourhood of the equator by the trade winds. Along the equator it flows for thousands of miles in a great current. On reaching the land it divides, and the southern portion subdivides, time after time, and finally is lost among the maze of islands constituting Australasia. The northern part skirts the Japanese Islands, gradually turning to the northeast, as it gets under the influence of the prevailing westerly winds, and soon disperses in the great waste of waters of the North Pacific.

These are the great oceanic movements. They are initiated by the winds, and their course is modified by the winds and by the shores. Besides changing the courses of the main currents, the shores and islands divide the currents, sending off numberless little minor streams of water in various directions.

Influence of the Ocean on the Land.—The land absorbs heat rapidly, and as rapidly cools. Water, on the other hand, is heated slowly and holds its heat longer. Moreover, the sea is constantly in motion, its waves, tides, and currents—especially the latter—tending to create a uniform temperature throughout the mass. In consequence of all these conditions, the sea has a much more uniform temperature in its different parts and at different times than the land. It is warmer in high latitudes and cooler near the equator; it is warmer in winter and cooler in summer. It follows, further, that the coasts on which the prevailing wind is from the sea share in this amelioration of climate, while the interior of continents, and coasts on which the prevailing winds are from the land, do not share in this amelioration of climate.

Here we have the application of all that has gone before. On the northwest coast of America the prevailing winds are from the west, from the sea, and they bring to the coast the climate of the sea, which is warmer on an average through the year than the land, and also much warmer in winter and much cooler in summer. The coast of Europe is under similar conditions, while the east coast of the United States and of northern Asia is under reverse conditions. Here the prevailing winds still being from the west come from the land, and they give these coasts a continental or land climate, which is much colder in winter and warmer in summer. As was stated before, the cold climate of the east coast of the United States has been attributed to an arctic current flowing close inshore. If there were such a current, it could have no effect upon the climate of this coast, since the prevailing winds are from the west, and could not bring the cold of the sea to the land.

NATURE NOTES FOR SEPTEMBER.

By the REV. CANON STEWARD, M.A. (Oxon.)

Principal of Salisbury Training College.

Migration of Birds.—Students may make a sketch map of Europe and North Africa, showing the established routes of the migration flights; for the winter migrants, chiefly Seabirds and Waders, will begin to arrive from their northern breeding places. The Swifts have started for South Africa, the Sandmartins will soon follow, with the Night Jars, Red-backed Shrikes, Spotted Fly-catchers and Turtle Doves. Quail are still met with in cornfields. Near woods the Green Woodpecker's undulating flight and mocking laugh may be noticed. Starlings reappear by their spring nesting-places, uttering not the merry note of spring, but a monotonous, plaintive, whistling cry. Westell ("A Year with Nature") notes four sets of music uttered by the Robin at this season.

Butterflies and Moths.—This is a busy month for rearing larvæ and collecting pupæ. It is possible still to see a Clouded Yellow or a Camberwell Beauty. Three of the Thorns (*Eunomos*) may now be found, as well as Striped Hawk (*Livornica*), Wood Leopard, Brindled Green (on tree-trunks), *Convolvulus Hawk*, Herald, *Epunda Lichenea* (sea coast), *Diloba C.*, Lunar Underwing (*Ivy*), *Xanthea F.*, Gold Spot, *Marvel du Jour*, &c.

Larvæ.—The huge caterpillars of the Death's Head Moth may be frequently found on the leaves of the potato. Painted Lady (thistles), Wood White (tufted vetch), Purple Emperor (willows), Lime, Privet and Poplar Hawks; *C. bifida* (poplars), Lobster (beech and oak), Red Underwing (willow and poplar), &c.

Search for pupæ should be made this month. Many rare specimens may be secured by digging with a trowel or small fork in the sod at the base of such trees as the poplar, willow, oak, elm, birch, beech, and hawthorn. A critical, but gentle, examination should be made of the soil, bark, moss, and dead leaves; many of the cocoons are very brittle, and others so resemble their environment as to defy detection.

Plant Life.—The Mints are now in flower, as *Sylvestris*, round-leaved, spear, peppermint, water, meadow, field, penny royal, and bergamot. Wild Basil, *Galeopsis*, *Ladanum*, *Gentian* (field and marsh); *Chenopodium rubrum*, *murale*, intermediate, *ficifolium* and *Botryoides* (Yarmouth, Lowestoft), *Geraniums*, *sanguineum* and *purpureum*. Toad Flax, round-leaved (East Anglia) and *repens*. Meadow Saffron: *Genista pilosa* (heather), Bearded S. John's Wort (Perth), *Crepis Pulchra* (Forfar), Ladies' Tresses (chalk hills). The rare *Pulicaria* or small Fleabane: *Erigeron*, *Solidago*, *Senecio squalidus* (walls, Oxford and Bideford), *Centaurea jacea* (Sussex) and *solstitialis* (rare), *Stachys germanica* and *ambigua*. *Orobanche ramosa* (East Anglia), *Diplotaxis muralis*, *Verbascum blattaria* (Kent, Cornwall), *Lobelia urens* (heaths, Devonshire), *Dodder* or *Cuscuta*, *Europeæa* (rare, Midlands, Scotland), and *Epinolinum* (Ellesmere). *Bupleurum tenuis* (East Anglia), *Par-nassus palustris* (bogs, north). By the sea: the Great Sea Stock (Wales), *Sisymbrium Sophia*, Yellow Horned Poppy, Marsh Mallow, *Koniger maritimum* (Devon), *Lavatera* or Sea Mallow (rocks, S.S.W.), *Goldilocks*, *Artemisia cærulescens*, *Diotis maritima* (S. and E.), *Euphorbia paralias*, Grass Wrack, *Convolvulus*, Sea Holly.

Fungi are now very plentiful. Examine and compare the Edible Mushroom, Fly Agaric, Stinkhorn, Chantarelle and Hedgehog Mushroom in damp woods: the *Polyporus*, Orange Stereum and others on rotten wood of old stumps and fallen trees.

The collector of the minute *Algae* will find the autumn the best time for Desmids and most Diatoms, for which ponds, ditches, boggy places, and the stems of Sphagnum may be searched. As the evenings grow longer he may wash out the specimens and prepare for the cabinet. The Filamentous *Algae* may be mounted for the herbarium after being floated on to stearine paper from a saucer of water and then dried.

Permanent preparations for the microscope can be made; but the microscopist will observe in the living specimens the different methods of propagation, the ciliary movements of the *Volvox*, the oscillating movements of the *Oscillatoria*, and the rotation of the protoplasm in the *Nitella* (*Characeae*).

Students of *Sea-water Algae* should obtain from a friend a packet of them from the seaside.

Mosses, with their spore-box and its operculum and calyptra, will well-repay investigation, the peristome in particular making a good study for the microscope.

Folk-lore.—"Plant trees at Michaelmas and command them to grow: set them at Candlemas (Feb. 2nd) and entreat them to grow."

THE COMMITTEE STAGE OF THE EDUCATION BILL.

CONTINUING the summary which was commenced in our last issue (p. 307) of the progress made with the Education Bill in the House of Commons, there has been, notwithstanding the prolonged and excited discussions of the past month, but a very moderate advance made. As our readers probably know, Clause 7 deals with the management of schools, and in the original Bill reads as follows:—

"All public elementary schools shall be managed in the case of schools provided by the local education authority by managers appointed by that authority under section 15 of the Elementary Education Act, 1870, and in the case of schools not so provided, by the persons who are the managers for the purposes of the Elementary Education Acts, 1870 to 1900, and this Act."

The wearisome discussions of the last weeks of the Session were, however, upon a revised Clause 7, proposed by Mr. Balfour, which read:—

"(1) All public elementary schools provided by the local authority shall, where the local education authority are the council of a county, have a body of managers consisting of a number of managers not exceeding four appointed by that council, together with a number not exceeding two appointed by the minor local authority.

"Where the local education authority are the council of a borough or urban district they may, if they think fit, appoint for any school provided by them such number of managers as they may determine.

"(2) All public elementary schools not provided by the local education authority shall have a body of managers consisting of a number of trust managers not exceeding four appointed as provided by this Act, together with a number of managers not exceeding two appointed: (a) Where the local education authority are the council of a county, one by that council and one by the minor local authority; and (b) Where the local education authority are the council of a borough or urban district, both by that authority.

"(3) One of the managers appointed by the minor local authority, or the manager so appointed, as the case may be, shall be the parent of a child who is or has been during the last twelve months a scholar in the school.

"(4) The 'minor local authority' means the council of any

borough or urban district, or the parish council, or (where there is no parish council) the parish meeting of any parish, which appears to the county council to be served by the school. Where the school appears to the county council to serve the area of more than one minor local authority the county council shall make such provision as they think proper for joint appointment by the authorities concerned."

Subsection (1) of the clause was disposed of before the end of July, and the discussions were chiefly concerned with subsection (2) providing for the management of voluntary schools. Eventually, the first part of Mr. Balfour's amendment, in a slightly altered form, was adopted as Clause 7, the parts from "where the local education authority are the council" to "authorities concerned" being omitted and left over.

Clause 7, in its modified form, as it stands part of the Bill, reads:—

CLAUSE VII.—MANAGEMENT OF ELEMENTARY SCHOOLS.

All public elementary schools provided by the local education authority shall, where the local education authority are the council of a county, have a body of managers consisting of a number of managers not exceeding four appointed by that council, together with a number not exceeding two appointed by the minor local authority.

Where the local education authority are the council of a borough or urban district they may, if they think fit, appoint for any school provided by them such number of managers as they may determine.

All public elementary schools not provided by the local education authority shall, in place of the existing managers, have a body of managers consisting of a number of trust managers not exceeding four appointed as provided by this Act, together with a number of managers not exceeding two appointed also as provided by this Act.

Notwithstanding anything in this section, schools may be grouped under one body of managers in manner hereinafter provided; and where the local education authority consider that the circumstances of any school require a larger body of managers than that provided under this section, the local education authority may increase the total number of managers, so, however, that the number of each class of managers is proportionately increased.

ITEMS OF INTEREST.

GENERAL.

THE King has approved of the appointment of Lord Londonderry to be president of the Board of Education, and of Sir W. R. Anson to be Parliamentary Secretary to the Board of Education. The Duke of Devonshire remains Lord President of the Council, and though he will no longer be concerned with the work of the Department for Education, he will continue to take charge of the Education Bill in the House of Lords. Sir John Gorst retires with the Duke of Devonshire, and the office of Vice-President of the Council becomes extinct.

LAST year's Education Act provided that where, during the year which ended on the 31st of last month, school boards had been spending money illegally on higher-grade and evening continuation schools, the county councils and county borough councils of the area were empowered to sanction such expenditure. Had the Bill now before Parliament been passed before the date mentioned, there would have been no need for further legislation in the matter. But, as it was, it was imperative that

something should be done if the work in night and other schools concerned was not to cease. The natural thing to expect was that the Government would introduce a short renewal Bill, but as this would have given the opportunity for protracted discussion, the course pursued by Dr. Macnamara was the better way. With the blessing of the Prime Minister, Dr. Macnamara succeeded in piloting the Education Act (1901) Renewal Bill through its various stages in an incredibly short time. Consequently, for another year at least, the useful work of evening schools can be continued.

THE Teachers' Registration Council have made the following announcement: All certificated teachers known to the Board of Education to have been employed since January 1st, 1901, in elementary schools, training colleges, or pupil-teacher centres, under inspection by the Board of Education, or in poor-law schools or certified reformatory or industrial schools, will be placed on Column A of the Register without further application. All other certificated teachers not coming under the above descriptions, who wish to be placed in Column A, must apply to the Registrar, Teachers' Registration Council, 49 and 50, Parliament Street, London, S.W. No special form will be supplied, but applicants must clearly state full name, address, date of becoming certificated, and name of last public elementary school in which they were employed.

IN reply to a series of questions asking how many of his Majesty's inspectors were at present engaged in inspecting secondary schools; how many of these were graduates of a British university; and how many had had three years' experience as teachers in secondary schools; Sir John Gorst stated in the House of Commons recently that all his Majesty's inspectors inspect secondary schools of some kind, and that most of them are graduates and most have had experience as teachers in secondary schools. The Vice-President refused to give an assurance that anyone who seeks an appointment on the inspectorate staff must be registered on column B of the Official Register of Teachers.

IN the Court of Appeal, before Lords Justices Vaughan Williams, Romer, and Mathew, another "Cockerton" case was, on August 5th, adjudicated upon. The question raised was whether under the Elementary Education Act, 1870, school boards have power to provide at the expense of the ratepayers schools for the education of their pupil teachers. Eventually a perpetual injunction was granted to restrain the London School Board from making, out of the school fund, any payments for the building of any such school other than a public elementary school. The School Board were ordered to pay the costs of the action. It is interesting in this connection to note the reply of the President of the Local Government Board to a question asking whether, in view of the powers to erect and maintain pupil teachers' centres which would be conferred upon the new educational authorities under the Education Bill, he would undertake to sanction any expenditure of school boards necessary to complete pupil teachers' centres already in course of erection. The reply was that any such applications made would be favourably entertained, though it must be understood that the sanction will only remove any difficulty on the part of the auditor in allowing the expenditure, and that no sanction in respect of works undertaken since the above decision could be promised.

THE Board of Education has issued a memorandum on physical training which provides school managers and teachers with numerous practical suggestions, principally applicable to rural schools. It is rightly urged that physical training should, as a rule, be carried on by the ordinary teachers of the school, and details of a scheme by which central classes of from 20 to

30 teachers can receive instruction from qualified non-commissioned officers in the "Model Course" (described by Mr. Chesterton in THE SCHOOL WORLD for August, 1902) are given in the memorandum. Great importance is attached to regarding this drill as an open-air exercise, and numerous plans are given for overcoming difficulties brought about by unsuitable weather and by overcrowding.

THE Secretary of State for War has decided that the *maximum* limit of age for candidates for admission to the Royal Military Academy, Woolwich, shall in future be 19 instead of 18, and that for candidates for admission to the Royal Military College, Sandhurst, 19½ instead of 19 (the half-year being reckoned by calendar months). The examination for entrance to these institutions, to be held in November next, will in other respects be held under existing regulations. There will be no limit to the number of times a candidate may present himself for any Army Entrance examination, provided he is otherwise eligible.

THE Board of Education has had under consideration the Specimen Courses of Instruction for Training Colleges issued by the Board in August, 1901, to which reference was made in THE SCHOOL WORLD of January of this year (p. 20). Training Colleges are now invited to submit for approval their proposed two years' course of study for the period 1902-4 to be pursued by the students who will enter the Training Colleges in September. It has been decided to modify the outline course proposed with a view, mainly, to the arrangement of the subjects in groups for the purposes of the Certificate examination of 1904. The subjects will be grouped as follows:—(a) Preliminary or qualifying subjects which will be tested by inspection and oral examination, but not, as a rule, by written examination, including reading, black-board drawing, music, manual instruction (for men) or needlework (for women), physical training, and practical elementary science, including nature study; (b) the practice of teaching; (c) four obligatory subjects in which written examinations will be held—theory of teaching English language and literature, and history and geography, composition, arithmetic and easy mathematics. (d) Not more than two optional subjects, in which honours can be obtained. Such subjects may be: a language, an advanced science, advanced mathematics, &c. Training Colleges will still be allowed freedom within certain broad limits to frame their own courses of study.

THE exhibition of students' works to which prizes have been awarded in National Competition is held for the first time in the well-lighted galleries of the India Museum, South Kensington, instead of in the temporary buildings at the back of the machine gallery of the Victoria and Albert Museum. The change is in every way an improvement, as it is much easier now to judge of the work as a whole than it has ever been before. Though fewer gold medals have been awarded than usual, the general level of work is very good, somewhat higher than last year. The drawings from the antique are a distinctly poor collection, but those from life are better than in past years, and there is one figure modelled from the life which is admirable. The bulk of the exhibits consist naturally of designs for different processes of manufacture and decoration, and it is gratifying to see in how many cases these are accompanied by specimens of the executed work, and how much better the majority of the drawings are adapted to execution than in days gone by. Some of the best designs are for embroidery and silversmiths' work, but pottery, mosaic, book illustration, printed muslin, and stencilling are all well represented. There are fewer good designs for stained glass than last year, and those for linen, damask, and woven fabrics generally, are less good than might have been expected. The architectural drawings, too, show rather a falling off. The schools as a whole seem to be more in

touch with the local industry than they used to be, but there are many centres in which a still closer connection should prove advantageous both to the schools and the manufacture. It is to be regretted that, as last year, there are no exhibits from the Royal College of Art, and also that the Glasgow School of Art sends nothing this year. The examples of first and second-class passes in the May local examinations, shown at the entrance to the exhibition, are good types, and sufficiently indicate the standard of work required for a pass in the various subjects.

THE trustees under the late Mr. Rhodes's will have entrusted to Mr. G. R. Parkin, C.M.G., Principal of Upper Canada College, and the well-known author of "Life and Letters of Edward Thring," "The Great Dominion," &c., the task of preparing for their approval a scheme for giving effect to the provisions contained in the will directing the establishment of Colonial and American scholarships.

MR. P. A. BARNETT informs us that there is no foundation for the statement which has found its way into the columns of some of our contemporaries, that he was a candidate for the Chair of Education at the University of London.

A CONFERENCE of representatives of Universities and of associations of teachers will be held at Cambridge in the ensuing Michaelmas term to consider certain questions relating to the training of teachers in secondary schools for boys, arising out of the Order in Council, dated March 6th, 1902, for providing the manner in which a register of teachers shall be formed and kept. It is certainly time that some agreement was arrived at as to the most desirable course to pursue in the case of teachers in secondary schools. Either the theory and practice of education is a post-graduate study, or candidates for the teaching profession may enter upon the study of pedagogic subjects during their undergraduate career. It should not be difficult for our experts to arrive at a conclusion as to which is the better course to adopt.

FOR children, whose parents are able to arrange for them visits to the seaside or to the country, the long vacation is the happiest time of the year. But for many of the children who attend public elementary schools in our large towns the summer holidays are at best a dreary time. Many of them have no choice between stuffy rooms and uninteresting, narrow streets, for they live too far away from them to be able to use the public parks. For some years this difficulty has been met, in a large measure, in America by vacation schools, in which the primary object is to interest the children and to brighten their holidays. Ordinary school-lessons are ignored, and half the pastimes are followed in the open air. We are glad to be able to report that this excellent idea has been successfully tried this summer in London. At the Passmore-Edwards Settlement, Tavistock Square, Mrs. Humphry Ward has had in thorough working order a vacation school, which was attended by some eight hundred children. The whole of the public rooms of the settlement buildings were given up to the school, and the Duke of Bedford allowed the beautiful garden at the back of the settlement to be used for the purposes of the vacation school. The work was under the direction of Mr. E. G. Holland, of Highgate School, and met on five days a week in the morning and evening. We trust that next summer there will be many such schools, not only in London, but in the large manufacturing towns of the north and midlands.

A NOVEL kind of competition, which may prove to be of value amongst the forms of a secondary school where manual instruction is included in the curriculum, has been inaugurated at the Storey Institute, Lancaster, by the Principal, Mr. Wm. French. Boys from the elementary schools of Lancaster attend

classes in manual training at the Storey Institute, and a valuable Challenge Shield is offered for competition amongst them and will be held for one year by the school which obtains the highest aggregate of marks during the preceding school year. In determining the holder of the shield, the total marks gained by each school during the session of thirty consecutive attendances are to be added together and divided by the number of boys on the register from that school at the date of commencement. The award of marks will be as follows:—(1) Two marks to each boy for each registered attendance, one mark being deducted for late arrival. (2) A maximum of fifteen marks for work done at each attendance, viz., five for drawing, and ten for bench work. (3) An annual examination test for each class, at which a maximum of one hundred marks will be given, viz., twenty-five for drawing, and seventy-five for bench work. (4) Any cases of misconduct will be reported to the Principal, and if the offence be repeated, marks may be deducted up to a maximum of five for any lesson.

THE United States Department for War has taken an important step towards providing military education for boys in American schools. One hundred army officers are to be appointed to those schools and colleges undertaking to maintain a hundred pupils under military instruction, which must conform to that given in the regular army. Due provision is to be made for proper target practice in all such institutions, and in the existing military schools, manoeuvres and the elements of engineering are to be taught. A record will be kept of all pupils taught under the new scheme.

SOME interesting experiments have been tried by certain school authorities in South Germany to test the faculty of observation as it is exercised by boys and girls. A man dressed as an ordinary workman and with ordinary features was placed in a room by himself. Classes of girls of different ages were sent through the room. All that the teacher told them was that they were to go into the room through one door and out through another. When they returned to their class-rooms they were asked to describe the man in the room. Nearly 80 per cent. of the girls confined their attention to the man's clothes; the others described both clothes and features. The same experiment, when tried with boys, revealed the fact that nearly 70 per cent. of them confined their attention to the man's features, the remainder to both features and clothes.

SEVERAL new text-books of elementary mathematics may be expected as the result of the reform movement. Messrs. George Bell and Sons have in the press two new volumes of the "Cambridge Mathematical Series" which will embody the recommendations of the Committee on the Teaching of Mathematics appointed by the Mathematical Association. The first is a volume of "Examples in Algebra," by Mr. C. O. Tuckey, an assistant-master at Charterhouse. The other is an "Elementary Geometry" (comprising the substance of Euclid, Book I., 1-48; Book III., 1-34; and Book IV., 1-5), by Mr. W. M. Baker and Mr. A. A. Bourne, assistant-masters at Cheltenham. Both of these volumes will be ready for use after the summer holidays.

THE new edition of the Calendar of the University Correspondence College is convincing evidence that the Principal and his able body of Tutors are determined to maintain the reputation for helpfulness to the private student which they have enjoyed for so many years. Detailed instruction as to how to proceed, both under the old and the new regulations for Matriculation at the University of London, make it quite easy for a student in the country, away from an educational institution of the ordinary kind, to prepare himself to become an undergraduate of London University. When he has succeeded in this initial task the

student will find in the *Calenjar* all the steps on the way to a degree clearly mapped for him. There would seem to be little doubt that the students of the Correspondence College will figure quite as prominently in future as they have on past lists.

THERE are, says Mr. James Swinburne, in the *Westminster Review* for August, two types of mind, one depending chiefly on memory and being reproductive, the other on reasoning and being creative. The former may be called the feminine and the latter the masculine type of mind. But the feminine mind is by no means the exclusive possession of women, any more than the masculine mind is of men. At present, as is shown by an examination of school and college curricula, the feminine mind is alone appreciated, though the developed masculine mind is of greater real importance. The arguments by which Mr. Swinburne seeks to establish his propositions are interesting, even if they are not particularly novel. It is only necessary to quote one or two of the results arrived at in the essay to show that it is well worthy of careful study, e.g.: "Though the feminine mind can acquire mathematics, it takes a masculine mind to discover or use it." "In spite of the few marked exceptions, it cannot be held that women are scientific." "The clergyman is the highest development of the feminine mind." "The origin and continuance of our system of education is clerical purely."

WE have received a copy of the third edition of the "Catalogue of Chemical Apparatus" of Messrs. Philip Harris and Co., of Birmingham. The book, which is well bound, contains some 250 pages, and is very fully illustrated. In several instances where the apparatus offered for sale is of a complex nature, a full description of its use is given. We are glad to see that the excellent and reasonably priced balances of Sartorius find a place in the list, though the convenient side release, used in some forms, is not shown. The catalogue seems to have been brought well up to date, as evidenced by the furnaces for gas and electricity, gas analysis apparatus, and filtering arrangements detailed.

A NEW edition of the volume entitled "Chemical Handcraft," which forms the price list of chemical apparatus of Messrs. Griffin and Sons, of Lincoln's Inn Fields, has just been published. Well bound, printed on good paper and well illustrated, the volume is quite in keeping with the high reputation of this long-established firm. In the 450 pages of the book a great many pieces of apparatus for special purposes are figured and described. The tendency of the modern catalogue in this direction is but a sign of the times, specialisation becoming more and more of a necessity as the field of science widens. Several forms of pyrometer are described, and some very useful forms of furnace for single Bunsen burners. Several of the nine pages devoted to air pumps seem rather unnecessary in a chemical catalogue. The subjects of distillation and filtration receive a good deal of attention, as does also the analysis of gases. A fairly extensive list of reagents is included; those which are considered "dangerous" by railway companies have a distinguishing mark attached to them.

MESSRS. E. J. ARNOLD & SON, Limited, School Outfitters, of Leeds, inform us that they have purchased the miscellaneous and general stock held by Messrs. Moffatt and Paige, Limited, of 28, Warwick Lane, London, E.C., and that any enquiries for these portions of Messrs. Moffatt and Paige's stock should be addressed to them.

SCOTTISH.

THE secretaries of the University Court of the four Scottish universities have received through the Secretary of the Carnegie Trust a scheme for the distribution over five years of £200,000

among these universities. The explanatory letter which accompanies the scheme lays down two principles which the Trustees have regarded in distributing their funds. The first one is "the retention in the hands of the executive committee of the administration of any funds for the encouragement of post-graduate research." The second shows that the capital funds of the Trust are to be left untouched, and no extensive permanent devolution of its income will be made. However acceptable the grants may be to the different University Courts, the terms of the covering letter will awaken resentment in university circles. They show very plainly the intention of the Trust to keep the power of initiative as well as of the purse in their own hands. While there may be a sentimental regret at the deposition of the University Courts from their high estate, it is certain that the universities will be spurred to renewed activities by the necessity of passing in review before a body so strongly constituted as the Carnegie Trust.

THE Executive Committee of the Carnegie Trust has hitherto accepted the different examinations qualifying for admission to the various faculties at the University as evidence that applicants for the benefits of the Trust "were deserving and qualified." As the qualifying examination for entrance to the medical faculty is on a much lower grade than in the other faculties, medical students had a decided advantage over their fellows in Art and Divinity. The Executive Committee at their last meeting had this subject under consideration, and, while continuing the present conditions for the session of 1902-3, has resolved that an approximately uniform test of preliminary education will be applied to all beneficiaries after that date.

THE Earl of Elgin, in speaking at the annual dinner at the close of the Merchant Company Schools, Edinburgh, said that Scotland was expecting reforms in its secondary and technical education, and that no man was more qualified to give them these reforms than Lord Balfour, who had stated on a recent occasion that an extension of school management areas was an absolutely essential element in any scheme of reform. He, Lord Elgin, quite agreed with this view, but whatever scheme was adopted would have to be sufficiently elastic to suit both urban and rural districts. He thought, also, that if there was to be an extension of areas, it must include every one within the area, and that there must be some co-operation between rating and endowed authorities. The difficulties in the way of arriving at a workable scheme which would conserve the rights of the governors and at the same time bring them into some sort of control by the representative body were very great, but he hoped not insuperable.

PASSES at the Leaving Certificate examination will be accepted from intending students by the University of Oxford under the following conditions: (1) No evidence of a pass shall be accepted unless the candidate has passed in Latin and Greek on the Higher Grade and in Mathematics (at least on the Lower Grade) at one examination. (2) Any candidate who, having satisfied the above conditions, has in addition gained honours in Greek, Latin, French or German, shall be considered to have passed an examination equivalent to Respon- sions together with an additional subject.

THE Senate of Cambridge University has approved of the following recommendations in the case of candidates who possess Leaving Certificates of the Scotch Education Department: (1) That a student who in one and the same year has passed in the Higher Grade in both Latin and Greek be excused from Part I. of the Previous examination with the exception of the paper on the Greek Gospel or its substitute. (2) That a student who has passed in the Higher Grade in Mathematics and English be excused from Part II. of the

Previous examination with the exception of the paper on Paley's Evidences or its substitute. (3) That a student who has passed in the Higher Grade in French, or German, or Mathematics (including Dynamics) be excused from the additional subjects of the Previous examination.

THE results of the examination for the L.L.A. diploma of St. Andrews University have just been issued. The examinations were held at numerous centres at home and abroad. From the report it appears that 929 candidates entered, as compared with 962 last year; 282 candidates entered this year for the first time, and, from the commencement of the scheme in 1877, 5,684 candidates in all have been examined; 127 students have this year completed the requisite number of subjects, and will receive the L.L.A. diploma of the University.

IRISH.

SEVERAL important subjects will be brought before the Educational Science Section of the British Association, at the meeting to be held at Belfast on September 10th-17th. Following the procedure adopted last year, arrangements have been made for the consideration of specific points at each morning and afternoon meeting, instead of accepting a variety of papers. By this means attention can be concentrated upon matters requiring the expression of competent opinion. At the morning meeting on Thursday, September 11th, Prof. Henry E. Armstrong, F.R.S., will deliver his address, and Dr. W. J. M. Starkie will read a paper on "Recent Reforms in Irish Education—Primary and Secondary—with a view to their co-ordination." In the afternoon the Report of the Committee on the Teaching of Mathematics will be presented. It is hoped that an opportunity will be afforded at the same time for reference to the Report of the Committee of the Mathematical Association on the same subject. On Friday, September 12th, in the morning there will be a debate on Irish Educational Work, opened by papers on (1) "Intermediate Education in Ireland," Mr. R. M. Jones; (2) "The Introduction of Practical Instruction into Irish National Schools," Mr. W. Mayhew Heller. The afternoon subjects will be "Technical Instruction in relation to Industrial Development in Ireland," Rt. Hon. Horace Plunket; and Reports of Committees on Teaching of Science in Elementary Schools, and Conditions of Health essential to the Carrying on of the Work of Instruction in Schools. The morning of Monday, September 15th, will be devoted to a debate on "The Training of Teachers," in which Prof. Withers, Miss Walter, and others will take part. In the afternoon Dr. C. W. Kimmins will read a paper on "The Order in which Science Subjects should be taught in Schools." On Tuesday, September 16th, there will be a debate on the "Teaching of English," introduced by Mr. P. J. Hartog and Canon Lyttleton; and in the afternoon a joint discussion with the Section of Mechanical Science on "The Training of Engineers." On September 17th, an Interim Report on Examinations will be presented, and also papers on "Educational Experiments."

THE short summer courses arranged last year by the Department of Agriculture and Technical Instruction for Ireland, and held in Belfast, Cork and Dublin, proved so successful that similar courses were provided again this year. The department were able to secure the services of Sir Wm. Ramsay, who organised a course of instruction in chemistry in Dublin. Three laboratories were in use; 30 students studied at the Royal College of Science, 24 at St. Andrews College, and another 24 at the Christian Brothers' School, North Richmond Street, Dublin. In addition to directing this course of instruction, Sir Wm. Ramsay gave a series of eight afternoon lectures on "Some

Episodes in the History of Chemical Discovery." At Belfast a similar course in chemistry (without the additional lectures) was conducted in the Queen's College laboratories by Prof. Morton, who had 40 students under his direction. In Physics, Prof. Barrett supervised the work of 50 students at the Royal College of Science, Dublin; Prof. Morton, of 30 at Queen's College, Belfast; and Dr. Buchanan, of 40 at the Christian Brothers' School, Cork. There has been only one course in manual instruction. Twenty teachers assembled for instruction in the workshop of the Christian Brothers' School at Tramore, County Waterford. In addition to these courses, conducted at the larger centres, some half-dozen courses have this summer been arranged at various of the convent centres. As a rule, the number of teachers at each centre have been from about eight to a dozen.

WELSH.

THE Senior Deputy Chancellor of the University of Wales has communicated with the Town Clerk of the Corporation of Cardiff as to the site which is offered to the University Offices in Cardiff. The Corporation have still under discussion the amount of space to be allotted to the University offices. The suggestion is to give half an acre of land. Some of the members of the Corporation seem to think that amount is too generous an allotment. Yet it is to be remembered that the University is a growing institution, and that muniment and record rooms have to be provided. Cardiff, however, now that it has taken the matter in hand, will, it is fully expected, do the thing handsomely.

WALES takes education questions very seriously, not to say intensely. But we have not seen anything so strongly put in the way of opposition to the Government Education Bill as the following resolution that is reported in a Welsh newspaper from the Carnarvonshire County Council: "That in view of the refusal of the Government to introduce provisions for safeguarding public interests with regard to voluntary schools, notwithstanding the whole financial responsibility is thrown upon local rates aided by Imperial grants, this council, as one of the authorities to be charged with the administration of the Bill, desires to intimate to the Government that until such safeguards are introduced they will not carry out the provisions of the Bill in County Carnarvon." They further are said to have decided to ask the co-operation of other Welsh county councils.

THE Cardiff Higher Grade School is evidently distinguishing itself in examinations of a secondary grade. It is said that 114 boys have passed the Matriculation examination direct from this school. In the last June Matriculation examination of the University of London, one of the boys has come out first in the Honours Division, winning the exhibition of £30 for two years.

EVERYONE in Wales must realise that since the Intermediate Education Act came into force a large amount of money has been raised for building of Intermediate schools. It may be pointed out that expenditure on buildings has not been limited to the schools which come under the Act. For instance, Llandovery School, which has been termed the "Eton of Wales," has added new buildings and improved the old buildings. It is announced that £3,000 are still needed to meet the cost.

MR. L. J. ROBERTS has recently spoken at Rhyl on "the place of History in the School Curriculum." In the course of an eloquent address, he said: "It is disquieting to find that the Welsh County Schools, while earning the warm and even enthusiastic praise of the examiners for the thoroughness and excellence of their work generally, were, with some striking exceptions, often criticised severely for their history teaching."

Mr. Roberts felt that history had been in English schools treated too much as an intruder "entitled only to a berth in a cold corner after languages, mathematics, science, music, drawing, had been comfortably provided for." History, moreover, was often entrusted to a member of the staff who might have an odd hour to spare from his other work. Amongst the points to be especially borne in mind in history teaching Mr. Roberts recommended:—Graphic oral methods, and the employment of a text book and reading books. History in the junior classes should be taught as an epic, drama, or song, based on some heroic figure or striking incident. Lastly, Mr. Roberts insisted on the necessity of co-ordinating the history with the other subjects of the school curriculum. But he added that co-ordination or concentration was only valuable in the hands of an intelligent teacher.

JESUS College, Oxford, is *par excellence* the Welsh College in that University. The revision of and alteration of the Statutes which passed through Parliament last month is an event which has considerable significance for Wales. The fact is that Welsh students entering the university are frequently of humble birth, and even with an entrance scholarship it is often difficult for a student well worthy of a university career to see his way to it. It is, therefore, we think, a step in the right direction to raise the value of scholarships and exhibitions. We should think so, even if the number of scholarships had to be lessened in number. But we understand they will be increased in number. The value of the scholarships is also increased from £80 to £100, and the exhibitions from £50 to £60. There is also, we may add, at Jesus College, a Welsh Graduate scholarship, for which there ought to be keen competition, with the increasing number of graduates in the university of Wales.

In continuation of a note in the previous issue, we are glad to note that at a parish council (Llanasa), in the county of Flint, the chairman referred to the need of some system by which persons who showed that they were possessed of natural musical talent might receive better facilities for a musical education. He suggested—and the parish council agreed—that application should be made to the County Council of Flint to establish musical scholarships at centres where scholars from Flintshire might obtain a musical education.

CURRENT HISTORY.

ROME has made another conquest. At least, she has another pupil. And the new pupil is being introduced by the latest previous acquisition. In plain English, China has asked Japan to send her an instructor in international law. For international law is Roman law writ large. When, amid the horrors of the Thirty Years' War, the last and worst fit of the anarchic madness that was one result of the sixteenth-century Reformation, the Dutchman who Latinised his name into Hugo Grotius sat him down to find a new morality for the warring nations, he adapted the law of Rome to the circumstances of his time. The *Jus Belli ac Pacis* is the old Roman law proposed for the regulation of the relations between the monarchs of Europe. What the individual person was in the old law, that the individual State was in the new. They were to be all equal before the law. When the fit was over, and the great peace of Westphalia was made, the principles of Grotius were adopted, and are to this day the foundation of all relations between civilised states. At first and for long confined to Christian countries (the subjects of the Holy Roman Empire), it has now spread to include others, and, as we remarked above, Japan, having a few years ago entered the "comity of nations," is now requested by even China to be introduced into the same society. Another example of the dribbling in of the Millennium?

THE *Court Circular* has said, "Prime Minister"; and when some people remarked on the impropriety of the term, it was remembered that it said it once before. "Is this important? if so, why?" would be a good question to set an upper form. And the answer to this, as to so many constitutional questions in this country, must be historical. If there is a "post of Prime Minister" it is an unpaid one. The sovereign asks some one to be "First Lord of the Treasury," or "Lord Privy Seal," and then further requests him to nominate his colleagues who are to hold the other (paid) offices in the ministry. Is this process to be described as "naming the Prime Minister"? If so, what was the first instance? When the Cabinet, then a comparatively new and almost untried institution, lost its head in 1714 because George I. could speak no English, it was for some time headless. Walpole always protested against the charge made against him that he was a "prime" and even a "sole" minister. He fell because he was so. After him, the ministry was headless again—at least, it would be difficult to name the head for some time. Who was the first minister who stood to his colleagues as Mr. Balfour stands to-day? Was it Pelham? Chatham? the younger Pitt? Liverpool? Grey? Melbourne? or is the institution, *as it exists to-day*, modern, Victorian, like so many of what we fondly imagine are our ancient, fundamental institutions? Must we parody Pope, and say, the British Constitution never is but always to be—perfect?

A ROYAL Commission has lately issued its Report on the condition of the Port of London. And it appears that for some years the Thames has been falling behind in the matter of accommodation for the ever-increasing requirements of over-sea commerce. Something is to be done, and we commend the report to our readers as containing an example of the wisdom (?) with which the world is governed. Meanwhile the trade has of course been moving elsewhere, and, among other places to our old rivals, Rotterdam, Antwerp, &c. Our forefathers had more high-handed ways of getting rid of such rivalry than are possible for us nowadays. When Great Britain, then newly-come into existence, and the United Provinces of the Netherlands, the ally who was described by eighteenth-century statesmen as our cock-boat, secured the "Protestant liberties of Europe" at Utrecht against the aged Louis XIV. of France, they handed over the Southern Netherlands (corresponding to modern Belgium) to the keeping of their ally Austria, but under hard conditions. The "Sea Powers" were not intending to benefit Austria, and Antwerp was not to trade. The Scheldt was closed to sea-going commerce, and the boycott thus established lasted eighty years. Then it was broken by the French Republic which had conquered Belgium, and the "opening of the Scheldt" was the chief *casus belli* in 1793. It has remained open, Antwerp is a greater port than ever, and we must improve London. Such is the form which commercial wars must now take.

WHEN Vasco da Gama discovered the Cape of Good Hope and Christopher Columbus stumbled on America, the part which the Mediterranean had till then played in world-history seemed to be ended. But with the growth of European dominion in the East, the importance of the "Middle Sea" has gradually returned, and recent events on its coasts have served to remind us of the unity of history and to teach us that there are forces which under various names and in various disguises might almost be described as eternal. The "Powers" which inhabit the northern shores of the Mediterranean are still interested in its southern shores as they were two and three thousand years ago. Spain has relations with Morocco; France and Italy with Tunis and Tripoli. And our very latest news is startling in its suggestiveness. France is fortifying Bizerta. This, being interpreted.

means a revival of Carthage. Italy is interested and Rome is the capital of Italy. Is the old rivalry between Rome and Carthage to reappear at this late date? "They say" that Great Britain's policy is to play off one Mediterranean power against the other. Are we going to have a new meaning given to Cowper's poem on "Boadicea," and is the setting up of the British queen's monument in London going to typify a fulfilment of the prophecy contained in that poem?

RECENT SCHOOL BOOKS AND APPARATUS.

Classics.

M. Tulli Ciceronis Epistulae. III. Epistulae ad Q. Fratrem, Commentariolum Petitionis, Epistulae ad M. Brutum, Pseudo-Ciceronis Epistulae ad Octavianum, Fragmenta Epistularum. Recognovit brevique adnotatione critica instruxit, Ludovicus Claude Purser. Scriptorum Classicorum Bibliotheca Oxoniensis. (Clarendon Press.) (Not paged.) 2s. 6d. paper, 3s. cloth.—It is fitting that Mr. Purser, who has done so much for the correspondence of Cicero, should edit this volume. The recension is based on the Medicean codex, with reference (so far as available) to the group of MSS. called by Lehmann Z, and to the record of the lost Laurisheim group; for the *Petitio*, on Berlin F and Harleim H; in the letter to Octavianus, on MFH. In accordance with the plan of the series, the recension is conservative, and few conjectures are admitted, unless it be necessary (as Ernesti's *populi* added—*Q.F. i. 1, 22*). In *i. 1, 42, theatrum totius Asiae virtutibus tuis est datum* is taken from C, that is Cratander's edition based on a lost Laurisheimer, as being "beyond the power of a gloss-writer"; and it is certainly more effective and more Ciceronian than the bald readings usually adopted. A number of conjectures or corrections, not adopted in the text, are mentioned in the notes, more perhaps than is usual in this series, but justifiable in this case. In *iii., 5, 4*, the MS. AMIQΣEIZ is given up as hopeless, but the chief guesses are recorded. This volume is worthy of its companions.

Select Orations and Letters of Cicero. (Allen and Greenough's edition.) Revised by J. B. Greenough and G. L. Ketteridge. With a special vocabulary by J. B. Greenough. lxxv. + 403 + 226 pp. Illustrated. (Ginn.)—Parts of this book are adapted for the beginner, parts for more advanced readers; and it is really a pity that the two were not kept separate. For example, the Introduction contains an excellent and very full account of the Roman constitution, with all the technical terms explained; this is most instructive to the more advanced student, and is not insufficient for the top forms of schools. It contains also some good sections on oratory (that on Delivery, oddly enough, being separated from them by other matter) fit for the more advanced; and a section on Latin style which is needless except for beginners. In the text, quantities are marked, and the book is supplied with a vocabulary; yet the notes are filled with references to grammars which no boy or girl would be likely to look up. An odd feature about these references, by the way, is that numbers of them are not there; space being given in parentheses for references to the new edition of Allen and Greenough's Grammar to be inserted afterwards. "H. and B." is another title which is followed by a blank space, the only explanation given being that it means "Hale and Buck." Apart from these references, the notes are few and simple, but there is too much translation. The selection of pieces is good. Some improvement might be

made in the matter of the Introduction. The editors, in saying that Cicero's only rival on the literary side of oratory is Demosthenes, forget Burke, who as a literary man might be placed beside Demosthenes. He was greater than either in moral earnestness and political insight; nowhere in Demosthenes, or anywhere else, do we find such vehement and convincing statements of eternal principles. And why are Americans always so provincial? No one cares about the oratory of "the late Rufus Choate" (p. xlv.). However, we are spared Rudyard Kipling.

Ora Maritima. A Latin Story for Beginners. By E. A. Sonnenschein, LL.D. With Grammar and Exercises. (Swan Sonnenschein.) 2s.—The need for a simple beginners' book in Latin has often been felt. Caesar and Nepos are too hard, and besides, reading ought to begin soon after the earliest stages. Prof. Sonnenschein is familiar with the "new method" of teaching modern languages, and designs this book as an aid to ancient languages in the same direction. The book is a simple narrative of Caesar's invasion of Britain, interspersed with conversations on daily life, from the point of view of a British boy of that era. It is, as the editor points out in his preface, ancient history from a modern point of view. This book will form a useful sequel to the excellent beginners' book by Scott and Jones. At the end are "preparations," including vocabularies and grammatical tables for each section, and sentences for drill both ways.

Dent's First Latin Book. By Harold W. Atkinson and J. W. F. Pearce. With twelve coloured illustrations by M. E. Denham. ix. + 328 pp. (Dent.)—This is another book inspired by the "new method" of teaching modern languages. It must be admitted, however, that, in the attempt to combine the conversational principle with reader and grammar, it falls between two stools. We think that, if the former principle had been consistently carried out, a great boon would have been conferred on beginners. Even as it is, the book is interesting, and is a step in advance of the ordinary manuals. The little pieces are lively and skillfully constructed so as to afford practice in various rules. But Mr. Atkinson should not use *nec non* for "moreover," as in poetry. Part II. contains exercises for retranslation with the materials of the reading lesson. The vocabulary is arranged on the same plan as those of the modern-language manuals of this type.

Puerorum Liber Aureus. A First Latin Translation Book. By T. S. Foster, B.A. x. + 136 pp. (Black's Elementary Latin Series.) 1s. 6d.—Mr. Foster has hit on much the same idea as Professor Sonnenschein, and here gives us an account of the Roman invasion of 43 after Christ, "as it may have appeared to a Roman schoolboy living in Etruria." The boy's life is described incidentally, the story of the invasion being supposed to be communicated in a friend's letter. Conversations are made the means of conveying other historical facts. There are vocabularies and exercises.

The Odes of Horace. Edited by Stephen Gwynn, with 48 illustrations. viii. + 352 pp. (Blackie.) 5s.—There is some originality of view, or at least of expression, in Mr. Gwynn's Horace. "The poet of those who do not care for poetry," "the clubman among poets," his "moral maxims are frequently immoral"—such are one or two of the phrases which have struck us in the Introduction: the comparison of *i., 28, 2, munera cohibent*, with *ἄγμα πνευμάτων ἐκόμισε πόρτον* is apt, and so are many other comments among the notes. A new interpretation of *i., 3, 25*, is worth quoting: "There are four Pythagorean elements, earth, air, fire, and water; the first is man's inheritance, but he will not be contented with it, insisting impiously on trying to master the other three. And so the poet gives

examples of the fate that has met men who tried the other elements." On the other hand, there are needless trifles such as ii., 15, 6, "*myrtus*, p. 1, fourth declension, as the quantity shows," see also ii., 16; or alternatives which are practically out of the question, as i., 4, 18, *talis*, "some translate as an adjective." The syntax is not quite trustworthy. The infinitive of purpose (i., 2, 5) is a genuine Latin idiom, and may quite as well be used so by Horace and Propertius as by imitation of the Greek; *alite* (i., 6, 2) is most inadequately explained by "omission of *ab*"—why was *ab* omitted, that is the point. But Book II., Appendix III., on pluperfect indicative in conditionals, is good. Why is not the number of the book printed at the head of the page?

Virgil's Aeneid. Book III. Edited by M. T. Tatham, M.A. With the new Oxford text by special permission. With Introduction, Notes and Vocabularies. xxxix. + 133 pp. (Arnold.) 1s. 6d.—Mr. Tatham follows up his two books of the *Aeneid* with a third on the same plan. The Life by Donatus or Suetonius is translated, with a few explanations, and hints are given on the language, metre, and subject of the *Aeneid*, and a few allied questions. Most of these hints seem to us the kind of thing a reader ought to compile for himself; no boy will be likely to read them. The *Notes* are often too elementary; the pupil ought really not to be told that *fractae* means *fractae sunt* (53), *quis* "but he" (327). Most of them, however, are interesting, if longer than need be. The quotations from English literature are welcome. As a whole, the book lacks unity: needless trifles cheek by jowl with discursive illustrations, and a vocabulary at the end—it would seem that Mr. Tatham has everybody in view at once.

Livy, Book XXI. Edited by A. H. Allcroft, M.A., and B. J. Hayes, M.A. xxvi. + 136 pp. (Clive.) 2s. 6d.—The Introduction to this book, on Livy's Life and Method, Carthage, and historical topics, is well adapted to convey the necessary information in the briefest possible form. A discussion of Hannibal's route over the Alps is admirably clear and succinct. The notes, as usual, are too elementary; *citra* is explained as an adverb, and the merest grammatical trifles are explained. Apart from this, they are good; and this, a bad fault educationally, is likely to make the book more useful for private students who wish to pass the London Matriculation for 1903.

English Extracts for Latin Prose. Compiled, with introductory hints and sentences, by A. C. Champneys, M.A. viii. + 166 pp. (Longmans.) 2s.—We know of no one who is so skilful at compiling collections of pieces for Latin prose as Mr. Champneys, whose "Easy Pieces" (compiled with the aid of Mr. G. W. Rundall) we have known for many years and proved to be excellent. The easy pieces were, however, adapted; these are not, but are pieces of unaltered English suitable for a more advanced stage. The pieces are graduated in difficulty, and we can cordially recommend the book. The introduction contains some useful hints.

Latin Versions of Passages for Translation into Latin Prose. For the use of Teachers only. By A. W. Potts, M.A., LL.D. Second Edition. 101 pp. (Macmillan.) 4s. 6d. net.—For a more advanced stage still, Potts's "Aids," and the book to which this is a companion, need no recommendation, having long since won a well-deserved reputation. The same may be said of the versions which here appear in a second edition. They are models of scholarship, lucidity, and good style.

Plato's Republic. By Lewis Campbell. viii. + 184 pp. Home and School Library. (Murray.) 2s.—It is no easy task to write a treatise on the *Republic* in a small volume; and, for

a popular audience, much tact is needed to give the right amount of explanation and comment without swamping the reader in unfamiliar details. Prof. Campbell gives a brief account of the structure of the dialogue, insisting upon its unity. He then examines the Platonic conception of morals, the theory of ideas, and the various topics taken up in the book. Prof. Campbell has done his difficult task with real skill, and has produced a clear and interesting treatise, which, if we mistake not, will not only interest the general reader, but will be of assistance to the student who can read Plato in the Greek.

The Elements of Greek. A First Book, with grammar, exercises, and vocabularies. By Francis Kingsley Ball, Ph.D. ix. + 283 pp. (New York: Macmillan Company.) 6s.—This is a collection of exercises and reading lessons, with sufficient grammar prefixed to each. Of course the proof of such books lies in the using; this book has been tested in use before taking its final form, but we cannot pretend to speak positively as to its merits after a mere perusal. On the whole, the arrangement appears to be good. By beginning with oxytones of the first declension, and by similar selection later, the accents are made easier to learn than in any other book we have seen. The verb is begun early, a tense at a time; the passive comes before the middle, and the distinctive middle tenses are postponed. Doubtful quantities are marked. The reading exercises are taken mostly from the *Anabasis*, a few from other books. We are glad to see that other types than the simple sentence, the conditional for example, are introduced early; and that particles are not forgotten. A few illustrations are interspersed. But why are the aspirated sounds called "rough" (p. 4)?

Xenophon, Cyropaedia, Book I. With introduction and notes founded on those of H. A. Holden, LL.D., and a complete vocabulary. By E. S. Shuckburgh, M.A. xx. + 156 pp. (Pitt Press Series.) Dr. Holden's editions are monuments of learning and research, but are far too full for a school edition. Mr. Shuckburgh has done little more than leave out what he deems unnecessary. Although we are in favour of making boys in school work without notes as far as possible, we confess these notes are really good; the only suggestion we would make is that there should be less translation of single words, which the vocabulary makes needless.

The Anabasis of Xenophon. Book II. Edited by G. H. Nall, M.A. xxvii. + 100 pp. (Blackie's Illustrated Classics.) 2s.—The introduction, besides the usual account of Xenophon's life and works, contains a section on the author's style, and one on Cyrus. It is sufficient, and interesting to read. The notes are too elementary; they ought not to point out the accusative of duration, the dative of time when, and such things. The pieces of translation are done in good English style. The illustrations are good, and are fully explained.

Edited Books.

Introduction to Poetry. By Laurie Magnus. 174 pp. (Murray.) 2s.—This volume is full of scholastic detail and yet devoid of pedantry; it is a little masterpiece of fluency and literary charm. Nobody who takes it up is likely to lay it down until the last page has been reached with eager attention, and nobody can expend the least effort to follow Mr. Magnus without finding himself much the better for it. From beginning to end it is excellent, and the delightful style, the breadth and incisiveness of view, the sidelights which it opens upon life and thought, and the frequently deep philosophy which is attractively veiled in the author's persuasive rhetoric, make it at times fascinating. No better small book could be put into the hands of the kind of student for whom it was primarily written; and it is to be unreservedly commended.

Junior School Poetry Book. By W. Peterson. 144 pp. (Longmans.) 1s. 6d.—This collection of verse is delightful because the compiler has not ignored or disdained many old favourites, such as "Sing a Song of Sixpence" and "Little Boy Blue," with which the volume opens, nor the venerable ballad of "The Babes in the Wood." It would be worth having and using, even if it had no other title to praise, for just this happy characteristic of preserving in a modern and up-to-date form much that is left to memory and tradition in childhood days, but is worth a permanent place in printed pages.

In the World of Books. For Middle Forms. 256 pp. (Arnold.) 1s. 6d.—A fairly good collection of extracts both in prose and in poetry. The interest is by no means of a uniform nature throughout, but the compiler, it must be owned, has tried to blend very varied elements. Romance, history, and *belles lettres* are all drawn upon to furnish the material of these pages, which certainly range over a most extensive literary field: from the venerable Bede, through the unwelcome Herrick and the fribble Boswell, to the Robert Browning who possibly never quite understood himself, and the Charles Darwin who, perhaps, was never quite understood by anybody else in his own time. Truly a catholic selection, and quite good of its kind. But the title might have been less rhetorical with advantage.

Macaulay's Life of Pitt. By John Downie. 164 pp. (Black.) 2s.—We have often spoken in terms of high appreciation of Mr. Downie's work as an editor. This volume betters the best of it. Not only has Mr. Downie been fortunate in selecting a work in which Macaulay is less irritating than usual to those who do not blindly adore him—and that is to say a great deal and to hint at more—but the editorial part of his labour has been discharged with great care. Mark Pattison's essay on Macaulay is prefixed as in a previous instance, but not in order to save trouble for the editor. Mr. Downie follows with an introductory "Note" of twenty-four pages, which is really good reading, though, perhaps, his defence of Pitt is not historically worth much. Moreover, his assertion that Chatham had genius while William Pitt the Second had only talent is just as open to manifold objections as his concluding phrase about "Britains" (instead of Britons) "beyond the seas." But, notwithstanding, this is a good and careful edition, supplied with a splendid chronological table and notes worthy of any scholar. It ought to be widely used.

The Royal Primer Readers. Book III. 208 pp. (Nelson.) 1s.—An exceedingly interesting reading-book for juveniles, containing much highly varied literary matter both of prose and poetry. As should be the case in books of this kind, the illustrations are a most prominent and most satisfactory feature, and a happy thought in the compiler has led to the inclusion of several coloured, indeed rather highly-coloured ones for the most part, which from childhood's point of view cannot fail to add considerable charm to the collection. The "notes and meanings" at the end are particularly well done.

Selections from Campbell. By W. T. Webb. 133 pp. English Classics. (Macmillan.) 2s.—Campbell is not one of the most conspicuously recognisable of literary geniuses, though that he was a genius, if an unequal and often faulty poet, there can be no doubt. The compiling and inclusion in Messrs. Macmillan's well-known series of English Classics of these "Selections" is by no means the least happy addition to an already very representative collection; and as the writer of the Introduction has spared no pains in dealing with the defects of Campbell as a poet, and has accurately accounted for his failure as a man, in spite of the paradox of his long-continued social success and his tremendous and magnificent funeral, this volume

is a distinctly serviceable one. Rarely, one thinks, has "Procrastinating Tom" been more kindly or more justly dealt with, even in more pretentious literary efforts than an educational edition. The selections are adequate and meritorious, and the notes are excellent.

The Song of Solomon. By Rev. Andrew Harper, D.D. 96 pp. Cambridge Bible. (Pitt Press.) 2s.—This volume is very small even among the smaller contributions to this well-known series, but it is just as full of interest as it is of careful and comprehensive scholarship, which has in this case the advantage of being set forth in a singularly attractive literary dress. "The Song of Solomon" presents many "nuts to crack" to all thoughtful readers, and almost every possible theory of interpretation concerning it is liable to be upset by another no less subtle and no less plausible. As a literary conundrum, indeed, it is one of the standing riddles of the world of letters, sacred or profane; while the varied explanatory schemes which are appended to it by commentators have usually little interest, except for dogmatic theologians. Dr. Harper's edition, it must be said, is free from any reproach of this kind. He has constructed a romantic background for the whole, which has the advantage of being as creditable to his knowledge of human nature as to his fancy, and no less to his scholarship. Hence in discussing the purpose of this singular poem, and afterwards in dealing with the rational basis of the customary allegorical interpretation, and in summarising the history of this mode of criticism in the Church, the editor has made solid and readable contributions to the literature of the subject. For the most part he writes as a critic both of Budde and incidentally of Wetstein, and the theory of the former is given in tremendous detail in the second appendix; but his refutation of Budde's elaborate fallacies is temperate and convincing. The section of the introductory matter which deals with these questions is intensely interesting and well managed. The question about the dramatic form of the book brings to light interesting comparisons with Robert Browning in two well-known minor colloquial works, which are suggestive in a high degree, and the discussion *passim* of the Hebrew view of love as gradually evolved up to its highest expression and concept in the Song of Songs is full of charm. The inclusion of an appendix, wherein the whole text is set out in the form of lyrics, with an excursus expressing the action and detailing the events which form the basis of the action, materially assists in the enjoyment of the work. As a text-book this edition will be found invaluable.

Dyce's Glossary to Shakespeare. Edited by Professor Harold Littledale. 570 pp. (Swan Sonnenschein.) 7s. 6d.—It is a purely Shakespearean sentiment that "good wine needs no bush"; and so Dyce's Glossary needs now no commendations. It has earned its position by much service, and this present edition is welcome enough. A singular value perhaps attaches to these pages from the fact that not only has Professor Littledale added some new notes, and revised Dyce's explanations when necessary, but the references have been made applicable to any good existing edition of Shakespeare's plays. The labour of reducing the monumental nine volumes of Dyce to the dimensions of this most handy book of literary supplement has been singularly well done, and the modest hope expressed by the editor, that this glossary will fall midway in the estimation of scholars between Schmid's and the well-known work of Bartlett, will probably be realised to the full, and more. For our own part, we are prepared to use this book, even to the comparative exclusion of Bartlett's useful pages, for a long time to come. This work is as exhaustive as it is ably done, and being offered by Professor Littledale "as a tribute to the memory of Alexander Dyce," is a more than ordinarily pious oblation.

History.

A Short History of Rome. By W. S. Robinson, M.A. viii. + 486 pp. (Rivingtons.) 3s. 6d.—It is very difficult to write a history of Rome suitable for schools. Such a history should have the main facts clearly stated, without entering too much into detail, should avoid controversy, and in particular new theories which have not yet been fully discussed, but should sum up the results of investigation into doubtful points whenever they are generally approved by scholars. A great difficulty lies in the treatment of constitutional history, which is so uninteresting to the young but so indispensable to the right understanding of Rome. Mr. Robinson appears to us to have tackled this thorny subject with judgment and knowledge. He does not pooh-pooh the early legends, and he rightly sees a historical basis for them; in this respect he might have gone farther, since, for example, some historical fact probably lies at the root of the Rape of the Sabines. There is hardly sufficient ground, moreover, for suggesting that Appius Claudius desired to make himself a tyrant; but the policy of the Claudii is obscure, and has only recently been investigated systematically. But these are details: in the main the history is quite satisfactory, and Mr. Robinson is to be congratulated on a success. Tables of dates in Roman and contemporary history are added at intervals for reference. We wish, however, that Mr. Robinson had avoided the split infinitive.

The Middle Ages. By P. V. N. Myers. ix. + 454 pp. (Ginn.) 5s.—This is an introductory book of convenient size, suited to those beginning the study of European history. It contains fifteen clear maps, most of them coloured, a bibliography to each chapter confined to books available in English, and mostly bearing on English history, though other departments are by no means neglected, and an index in which foreign names have a pronouncing equivalent supplied. Written mainly for the American market—the English reader will be perhaps startled here and there by the word “our,” meaning “United States”—it is excellently suited for teachers of history wishing to know more than is contained in their pupils’ text-books, and specially to understand—what is so much neglected still among us—the correlation of English and continental history. The first part of the book seems vague and disjointed, but this is probably owing to the nature of the subject: the “Dark Ages” are not interesting. But this vagueness disappears as one goes through the book, and the penultimate section, on the Renaissance, is quite delightful reading, the best short account of that complete movement that we know in a book of this size. We heartily commend the book to all our readers.

The Abbey History Readers. Book I. To the Norman Conquest. 163 pp. 1s. Book II. From the Norman Conquest to 1485. 190 pp. (Bell.) 1s. 3d.—These books consist of “stories” with illustrative verse extracts. There are pictures of varying merit: some are good and instructive, others are old acquaintances which are not so desirable. The text has been revised by Dr. Gasquet, and we are therefore saved from the usual Protestant bias, but there are many matters which he has left that are “story” rather than history.

Famous Englishmen. Book II. Cromwell to Roberts. By J. Finemore. xii. + 247 pp. (Black.) 1s. 4d.—This is a good specimen of a biographical English history reader. The type is clear, the illustrations are numerous and good, the stories are told clearly. The author has selected twenty-one heroes, quite half of whom are fighting men. The history is fairly correct, though it would be easy to point out matters which will have to be unlearned afterwards if the pupils pursue the subject. But probably most of them will not do so, and it is only the professed student who would trouble about the variations we have noted.

Geography.

Australasia. The Illustrated Continental Geography Readers. 176 pp. + 8 maps. (Blackie.) 1s. 6d.—With the present volume Messrs. Blackie’s admirable series is complete. We have pleasure in testifying to the general excellence of the series, manifested as it is in *Australasia* in as high a degree as in the preceding readers. At the end of the present volume is a short appendix on climate. For interesting reading matter, an abundance of good illustrations, including several coloured ones, and for general accuracy the series would be difficult to beat.

Africa in 1902. By C. A. Wood, M.A., F.R.G.S. 19 pp. (Scholastic Trading Co., Bristol.) 6d.—A necessarily somewhat sketchy account of the commercial geography of Africa. The information it contains is, however, accurate and up-to-date. There are several sketch-maps showing railways and commercial routes, and one shows the battlefields of South Africa.

New Shilling Geography. 160 pp. (Arnold.)—In this book the allotment of space is as follows:—General Geography, 39 pp.; Europe, 62 pp.; Asia, 12 pp.; Australasia, 7 pp.; Africa, 9 pp.; North America, 8 pp.; South America, 5 pp.; and a statistical appendix of 8 pp. There is nothing of distinctive merit in the book.

We have received from Mr. Stanford a cardboard model based on the 6-inch Ordnance Survey of part of Berkshire. It consists of a strong leather case containing two pockets. In one pocket there is a set of the contour lines reprinted from the survey, each contour-level (they are made for 50-foot intervals) being printed separately. In the other pocket is the model with the contours cut out and imposed in their proper positions. The vertical scale is the same as the horizontal one. Mr. G. Herbert Morrell, M.A., is to be congratulated on the model which he has designed, and we strongly urge every teacher interested in geography to procure a copy and set about making one for his own locality, according to the instructions given. The size is 12 by 6 in.—thus representing an area of about two square miles, and the price is only 3s. A most useful example to follow.

Grammar and Composition.

Lessons in the Use of English. By Mary F. Hyde. xii. + 206 pp. (Heath.) 2s.—For the lowest forms of secondary schools this book should prove very suitable. There are in all 174 lessons, but the book may be obtained in three parts, price ninepence each. The first Part consists of 62 lessons or exercises in transcription, recitation, dictation, punctuation and composition. In Part II. the student is introduced to the parts of speech, and advances in his previous studies. The treatment of the sentence with still more advanced exercises in composition, &c., is reserved for Part III. The exercises are admirable; especially welcome are the finely-executed plates for use in composition. But everything is good, and we shall immediately buy copies for use in our own classes.

English Grammar. By W. Bryant. viii. + 168 pp. (Dent.) 1s. 4d.—The numerous exercises will be found useful in the lower forms of secondary schools; if otherwise there is little in the book that renders it in any way different from other text-books at present in use.

Foundation Lessons in English Grammar. By O. I. and M. S. Woodley and G. R. Carpenter. ix. + 166 pp. (New York: the Macmillan Company.) 2s. 6d.—Here, again, we are unable to direct attention to any feature of distinguishing excellence. As a matter of fact, there are several well-known books on English Grammar now used in our secondary schools that are not likely to be supplanted for some time to come. “Foundation Lessons” is for more advanced students than those catered for in Mr. Bryant’s book.

Science and Technology.

Manual of Astronomy. By Prof. C. A. Young. vii. + 611 pp. (Ginn.) 10s. 6d.—Professor Young's text-books of astronomy are among the best in existence. His "Elements of Astronomy" contains a course of work suitable for schools, and his "General Astronomy" is a standard treatise on the subject. The present volume is intermediate between these two, and should prove valuable to students who propose to take astronomy as a degree subject under the new regulations of the University of London. The book contains a survey of the whole ground of astronomical science, boldly and precisely described, and brightened with excellent illustrations. It will inspire the student and put him in close touch with the essential facts and theories concerning the earth as a planet and all other known objects in space. Among noteworthy points are Schiaparelli's observations of Mercury (with illustration), photographic discovery of minor planets, Keeler's demonstration of the meteoritic theory of Saturn's rings, photographs of comets, good reproductions of photographs of spectra, including Nova Aurigæ, Mira Ceti and Polaris, and some of Professor Hale's photographs of solar phenomena. A scale ought to be given on page 458, to show the actual size of the Gross Divina Meteorite, but this is a small matter. Students who want a good text-book of astronomy should obtain this one.

An Introduction to Chemistry. By D. S. Macnair, Ph.D., B.Sc. ix. + 182 pp. (Bell.) 2s.—Written for boys of fourteen or fifteen years of age, this book gives clear instructions for an interesting series of experiments which lead the pupils to a knowledge of some of the more important principles of chemistry. The experiments are to be made in a spirit of research upon common substances. Supposing four hours to be allotted to the work in each week, the pupil will not be introduced to formulæ and equations in the first session of his work. No reference is made to the atomic theory throughout the book; formulæ and equations are used merely to express the proportions in which the elements are found, by the experiments, to combine and react. Simple apparatus is employed, such as a boy may fit up for himself with the aid of the figures and instructions. The methods are good, and results obtained by following in the laboratory the directions given are satisfactory.

Elementary Physics and Chemistry for the use of Schools. By John Bidgood. Books I. and II. 136, 146 pp. (Longmans.) 1s. 6d. each.—These books are intended to serve as reading and also as lesson books in a course of Elementary Physics and Chemistry. The author recognises "that few schools are provided with laboratories for individual experiments," and the books are hence not intended as laboratory manuals. When consideration is taken of the very slight cost required to provide simple apparatus for individual experiment, it is unfortunate that, even now, admissions should be made of the above fact regarding science teaching in the country. The first book treats of matter and its properties; lengths, areas, and volumes; levers; solids, liquids and gases, and thermometers. The second deals with surface tension, latent heats, and elementary chemistry. In many of the chapters the author has been successful in rendering his subject clear and simple, but gravitational attraction and the inertia of matter do not form suitable subjects for the first chapter, neither are children of the calibre for whom the book is obviously intended capable of appreciating the variation, with distances of gravitational force. References to molecular movement which are frequently made are also unsuited to beginners, and objection may be taken to such statements as "heat has a great lessening effect on the cohesion of the body and on its other properties." A mistake is made in the statement of the value of the latent heat of fusion of ice. The

author has, however, evidently striven for scientific accuracy in expression, and, with a few such exceptions, has done so successfully.

Physiology for Beginners. By Leonard Hill, M.B., F.R.S. viii. + 124 pp. (Edward Arnold.) 1s.—Of its size this is one of the best elementary books on human physiology which we have seen. The facts are presented in concise yet simple and interesting language, and are illustrated by fifty-nine useful woodcuts. The book may be cordially recommended to students attending elementary classes in the subject.

Onward and Upward. By Hugh H. Quilter, B.A. (Oxon.). 200 pp. (Sonnenschein.) 3s. 6d. net.—This is a reading-book for boys and girls between the ages of ten and fourteen, and is intended not only to teach some of the facts of the evolutionary process but, by comparing and contrasting human beings with other members of the animal world, to work out and illustrate "a conception of human dignity and responsibility." In this we think the author has succeeded. The style is clear and interesting. Many of the illustrative drawings are, however, extremely crude.

A Course in Invertebrate Zoology. By Henry Sherring Pratt, Ph.D. xii. + 210 pp. (Ginn.) 6s.—Clear and exact instructions are here given for the examination and dissection of representative types of all the invertebrate phyla. The relationships existing between the various classes of animals described are constantly kept in mind, the "jerky" treatment common in manuals of this kind being thereby avoided. A useful glossary and a scheme of classification are given in an appendix. Unfortunately the book does not contain any illustrations. It may be confidently recommended to advanced students.

Mathematics.

A First Step in Arithmetic. By J. G. Bradshaw, B.A. vi. + 166 pp. (Macmillan.) 2s.—This is a useful little book with well-arranged exercises both for oral and for written work. The earlier pages contain some sensible hints on class teaching.

Elementary Geometry. By W. C. Fletcher, M.A. iv. + 80 pp. (Arnold.) 1s. 6d.—Mr. Fletcher's book requires, and is intended, to be supplemented by oral teaching. It is a concise summary, with outline proofs, of the essentials of plane geometry, including proportion (with the assumption that the quantities compared are commensurable). The exercises are numerous and of very different degrees of difficulty; some require the use of instruments.

Commercial Arithmetic. By F. L. Grant, M.A., and A. M. Hill, M.A. vi. + 356 pp. (Longmans.) 3s. 6d.—An unusually good work of its kind, with chapters on methods of computation, percentages, &c., besides the more technical subjects of invoices, stocks and shares, and so on. There are tables of four-figure logarithms, of shillings and pence as decimals of a pound, and specimens of compound-interest tables. Copies of examination papers recently set have been added at the end.

Academic Algebra. By W. W. Beman and D. E. Smith. x. + 384 pp. (Ginn.)—An elementary text-book, very well printed, with an immense collection of carefully graded exercises. It is rather surprising to find that graphs have been completely ignored: the authors have, in fact, refrained from novelties. For class purposes their work will doubtless be acceptable.

Miscellaneous.

Encyclopædia Britannica. The third of the new volumes, being vol. xxvii. of the complete work. Chi-Eld. xx. + 744 pp. (Black and *The Times*).—So many interesting subjects are dealt with in this volume that any attempt to describe the con-

tents in a short review must be futile. Only a few of the more important articles having connection with the work of schools can be mentioned. Sir Joshua Fitch's paper on education, and Dr. N. M. Butler's supplement to it, referring to education in the United States, are of especial interest to us. Sir Joshua traces the gradual growth of what may be called the English educational system, the forces which have controlled it, and the results it effected during the last quarter of the nineteenth century. The article is a valuable contribution to educational history, and it not only records in a judicial spirit what has been accomplished, but also suggests directions in which future advances should be made. To the student of human progress we refer the instructive essay, by Dr. H. S. Williams, on "The Influence of Modern Research on the Scope of World History," and the articles on Biblical Chronology and Egyptology. The mathematical articles include the subjects of combinational analysis, analytical dynamics, differential equations, and elastic systems. All important geographical divisions and places between Chicago and Elche are described, and biographies from F. J. Child to José de Elduayen. Science is very fully represented, among the subjects being colours of animals, comets, compass, condensation of gases, cytology, diffusion of gases, dynamo, and figure of the earth. There are also articles on cricket, croquet, cycling, draughts, and many other subjects of interest to teachers. Our early copy contains, in the concluding lines of the article on Edward VII., the words, "On 26th June, 1902, the solemnity of the Coronation of the King, and of Queen Alexandra, took place at Westminster Abbey." We believe that this unfortunate mistake has been rectified in the volumes sent to purchasers, by the substitution of a new page, at great expense. In conclusion, we do not hesitate to say that the new volumes make an essential supplement to the ninth edition of the work, and must be added to the shelves of every good school library.

Line and Form. By Walter Crane. xv. + 288 pp. (Bell.) 6s. net.—This is a cheap reissue in smaller form of Mr. Crane's well-known book, and is identical in size and price with the new edition of "The Bases of Design," which we noticed a few weeks back. It is not, of course, a text-book to be put into the hands of elementary students, but it gives much information which should be useful to all those who are engaged in teaching such students. The book is copiously illustrated, many of the drawings (which are the same size as in the earlier edition) being by the author himself. The careful observer will trace a decided connection between several of these plates and Mr. Crane's illustrations to the "Circular on Primary Drawing" issued some months ago. Indeed, the first three chapters, at least, of this volume should be read by all those whose business it is to interpret that Circular.

Landmarks in Artistic Anatomy. By Robert J. Colenso, M.A., &c. With six original plates. vi. + 62 pp. (Baillière, Tindall and Cox.) 3s. 6d. net.—Is an excellent book and one for which students of elementary anatomy for artistic purposes should be truly grateful. Mr. Colenso's aim is to give a general idea of the human form, and to this end, instead of beginning his subject with a minute study of the various bones, he proceeds from the seen to the unseen, and (presupposing, of course, a general knowledge of the skeleton), describes first of all the bony and tendinous "Landmarks" which the student can verify for himself on the living model, or, failing that, in a looking glass. The next chapters deal with the superficial muscles; and the bones in detail are taken last. The book is systematically and practically arranged, and should enable the art student to acquire a working knowledge of anatomy in a much shorter time than he could hope to do by the old method.

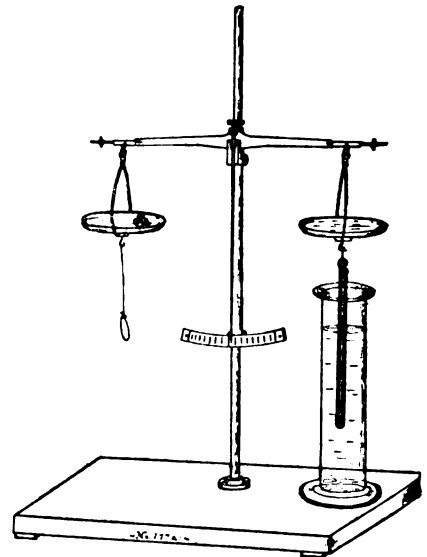
CORRESPONDENCE.

The Editors do not hold themselves responsible for the opinions expressed in letters which appear in these columns. As a rule, a letter criticising any article or review printed in THE SCHOOL WORLD will be submitted to the contributor before publication, so that the criticism and reply may appear together.

Quantitative Determinations by Schoolboys.

It is now generally admitted that some quantitative work in the chemical laboratory of a school is a necessity, and that qualitative work alone does not tend to foster the habit of working neatly and accurately and of reasoning correctly from observation in the same way as quantitative determinations do. But there are considerable difficulties arising from limitations of time and circumstance.

It is highly desirable that the pupils should learn to use a balance properly, so as to determine a weight correctly at least to a centigram. But balances adequate to this are expensive. With a form say of twenty boys, working in pairs, we should want at least ten balances, and even then it is a long time before the beginner has acquired sufficient skill to weigh quickly and without making mistakes. I suppose, at first he will require at least ten minutes for each weighing. To overcome this difficulty I have had made a "quick-weighing" balance,¹ of which I now



give a description, in the belief that it will be found useful by teachers in the lower forms of schools. A weighing—to about one centigram—can be made in less than half-a-minute. If, therefore, the experiment requires three weighings, and there are ten pairs of experimenters, the weighings will occupy less than fifteen minutes, and a set of determinations—such as described below—can be carried through in an hour's lesson, the results worked out and compared, and the mean result ascertained. The boys I am now speaking of are the Lower Fourth, above which there are four forms in the school. The balance, of which a figure is given, has two short pans provided with hooks: from the hook of one of the pans hangs a cylindrical piece of glass rod dipping into a vessel of water. The weights put into the pans are simply the nearest number of whole

¹ The balance is supplied by Mr. Tamblin-Watts, of Goldielands, Settle, at a cost of £1 20s.

grams; and the fractions are read off on the scale by means of the pointer, the scale being so made that a deflection of ten divisions corresponds to a difference of weight in the scale pans of exactly one gram. The balance then comes to rest with more or less of the glass rod out of the water; its oscillations are quickly stopped, and with a little practice the exact weight can be read off without waiting for the pointer to come actually to rest. The boys bring their test-tubes to be weighed, the master reading off the weight for them.

Example 1.—Determination of the weight of mercury combined with 16 grams of oxygen in mercuric oxide.

A test-tube, with a little loop of copper wire by which to hang it on the balance, is used: this is weighed empty, then again after the introduction of some of the red oxide (through a rolled-up piece of paper, to avoid soiling the sides of the tube), and then again after heating till all the oxide has been decomposed. It tends to economy of time if all the empty test-tubes are weighed at once, and if the quantity of oxide taken is as nearly as possible the same in every case.

The test-tube should be held nearly horizontal during the heating. The following numbers were obtained by twelve boys:—198, 198·7, 192, 194·9, 197·6, 212·5, mean 198·9.

Sources of error are: (1) failure to decompose all the mercuric oxide; (2) volatilisation of some of the mercury. These are opposite in the errors they introduce, and it is curious how, even when the individual results are wild, the mean still approaches the truth. Thus, the following means were obtained at different times:—195·1, 213·9, 192·2, 196·0, 198·9; these have a final mean of 199·22.

A third source of error is the impurity of the material employed. I have not been able to buy oxide which does not leave a residue on heating, amounting to about 1 per cent. apparently chalk.

Other determinations carried out in the same way are that of the loss of oxygen on heating potassium chlorate, and of water from washing-soda. The correct percentage of water in crystals of sodium carbonate is 62·9; 18 boys obtained the following results:—63·2, 64·8, 63·3, 62·7, 62·3, 63·74, 62·86, 62·9, 63·15. The mean is 63·2.

Other problems equally easy are the determination of water in copper sulphate, &c., and of oxide of copper from copper nitrate, lead oxide from lead nitrate, &c.

Example 2.—Determination of the equivalent of magnesium from the volume of hydrogen liberated on solution in dilute acid.

A length of one metre of magnesium ribbon is accurately weighed, and cut up into pieces of equal length each weighing about 0·04 gram. A 50 c.c. burette is employed in an inverted position, with a small funnel attached by a piece of india-rubber tubing to the point.

The burette is filled with water, inverted in a pneumatic trough, and the weighed piece of magnesium pushed into the tube and kept in its place by a plug of soaked cotton-wool. Then, the funnel being filled with acid, by cautiously opening the tap, it is easy to allow acid to enter without either admitting air or allowing any hydrogen to escape.

When all the magnesium has been dissolved the volume of gas collected is read off, the level of water inside the burette being adjusted just above the top of the trough, which is full of water. It will now be necessary to take account of temperature and pressure, and as the calculations for reduction of gas-volume for temperature, pressure and tension of aqueous vapour, are quite beyond the powers of the boys of whom I am now speaking, I employ the little instrument, suggested in Perkin and Lean's "Introduction to the Study of Chemistry," p. 264, which we call a "thermobarometer." This is simply a large air-thermometer, containing air over water, fixed on a stand and provided

with a scale giving the volume of the enclosed air which, if dry and at normal temperature and pressure, would occupy 1,000. If the instrument shows 1,063, then the correction required is simply to multiply the observed volume by 1,000, and to divide by 1,063. The following results for magnesium were obtained by 22 boys:—11·36, 12·55, 12·05, 11·97, 11·86, 11·42, 12·00, 12·51, 11·95, 11·78, 12·04. The mean is 11·95.

One important source of error is the warming of the gas by coming close to it in reading off the volume; it is therefore desirable to read the burette through a telescope from a short distance. The volume of the portion of the burette above the graduations must, of course, be determined.

The equivalents of zinc and aluminium may be determined in the same way. Seven experiments gave for zinc a mean of 32·45, the highest being 34·45, and the lowest 30·85. For aluminium we obtained 9·12.

The percentage of carbon dioxide in marble was determined by dropping a weighed piece of marble into a test-tube containing dilute acid and fitted with a cork and small calcium chloride tube, weighed before and after the evolution of the gas; the mean result was 44·46.

For the higher forms many other determinations are possible: e.g., the equivalents of copper, lead, magnesium, silver, &c., by dissolving weighed quantities of the metals in nitric acid, evaporating and igniting so as to obtain the oxide. Very accurate determinations of the atomic weights of copper and silver can be obtained electrically. Thus, two boys in the Sixth Form found that 0·4314 gram of copper was deposited in the same time as 250 c.c. mixed oxygen and hydrogen was collected when the same current passed through a copper-voltmeter and a water-voltmeter, the gas being measured at 12·8° C. and 743·14 mm., with a difference of (water) level of 53 mm. This gives 63·11 for the atomic weight of copper.

W. MARSHALL WATTS.

A Method of Demonstrating the Forms of Electrical Lines of Force.

IT is usual now, in teaching Electrostatics, to make use, even from the first, of the conception of lines of force; and this is desirable not only on scientific grounds, but also because the student is, as a rule, already practised in the use of the corresponding magnetic lines. The teacher, however, is often hampered by the lack of a practicable method (other than by the use of silk-shreds in turpentine) of exhibiting them. Several recent text-books describe the use of conducting needles, or pointers, which indicate the direction of the field at any point, but none, to my knowledge, suggest any means of obtaining a record on paper. This may readily be done by projecting the shadow of the pointer.

The method I have found most useful for showing electrical lines of force to a large class is illustrated in Fig. 1 (p. 360). Two insulated spheres are shown connected to the terminals of a Wimshurst, and standing on the lecture-table. A large sheet of drawing-paper is stretched on the board behind them, and their shadows are thrown on it by a suitably placed lantern not visible in the figure. A Stroud and Rendall lantern may conveniently be used, and can be arranged so that, while it is adjusted for the vertical projection of slides, a simple shifting of the mirror throws the shadows on the paper. The pointer is a small tube of fine writing-paper, about 3 cms. long and 1½ mms. diameter. A small hole is pierced through its centre of gravity at right angles to its axis, and by this it is strung lightly on a fine wire stretched between the arms of a glass fork. This pointer is moved about in the field so as to follow the lines of force, while the successive positions of its shadow and the outlines of that of the conductors are rapidly sketched in with char-

coal by an assistant. The Wimshurst is meanwhile turned by a motor or by a volunteer from the class.

The following cases are readily shown: two spheres with like or unlike charges; two conductors, one charged and the other earthed or insulated (this last requires a nice adjustment of the

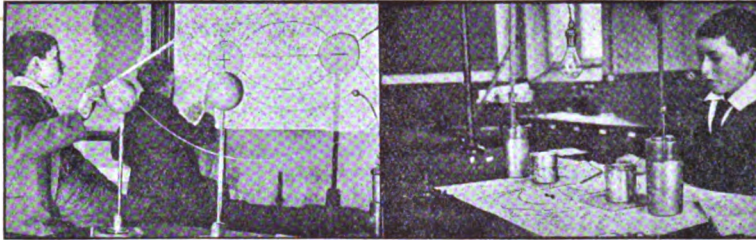


Fig. 1.

Fig. 2.

pointer); and the corresponding cases for the field between two condenser plates. The process is much faster than might be imagined; a good map can be obtained in three or four minutes.

The same experiment can be performed on a small scale by students in the laboratory, a lamp taking the place of the lantern; or, if the room is electrically lighted by lamps suspended singly over the tables, the method shown in Fig. 2 may be substituted. The conductors are now metal cans insulated by cakes of paraffin over a sheet of paper and connected to charged Leyden jars (see Ames and Bliss, "A Manual of Experiments in Physics"). The pointer is that described in Hadley's "Magnetism and Electricity," and the method of working will be obvious. The chief disadvantage is the difficulty of maintaining the insulation of the jars at high potentials in a room occupied by a class. It is better, when possible, to keep the conductors charged by connecting them to a Wimshurst.

I have also found lantern shadows useful in working before a class with a vertical galvanometer or a mechanical model for illustrating the law of the tangent magnetometer. If the students view the pointer and scale directly, they get different readings, on account of parallax. But if the pointer is painted the same colour as the scale, and its shadow cast upon the scale by a lantern, every student is able to observe the true reading.

WILLIAM BENNETT.

Municipal Technical School,
Gravesend.

Books on History.

CAN you find space for three notes on matters in the August number of THE SCHOOL WORLD which concern me either as author or student of History.

(1) Your very kind reviewer of my Book D suggests that I should "shorten or simplify" my series of "Problems and Exercises in English History." As many persons have subscribed to the whole series, I cannot "shorten" it, but have already arranged to "simplify it"; and this process of simplification will begin with the forthcoming parts dealing with English History down to 1399.

(2) Prof. Hearnshaw, in his very sound and readable article, has mentioned one or two announced books dealing with English and History for the New Regulations at London Matriculation. May I call his attention to the fact that my "Salient Points in English History," announced in the advertisement columns of your July number, will be specially adapted to both the "English" and the "History" portions of the new syllabus.

(3) I notice, in Prof. Hearnshaw's list of books recommended, that he mentions the "Mediæval and Modern History" by

Messrs. Thatcher and Schwill as if it were the only book available for that branch of the subject. Might I suggest that there are other books of American origin (e.g., Myers, G. P. Fisher, and G. B. Adams) which are not obviously inferior to Thatcher-Schwill; that there are many American books dealing with ancient

history in one volume which are not less satisfactory, from a combined educational and historical point of view, than the special works which he names. I venture to doubt whether any of the books of English history which he specifies so exactly meets the requirements of the syllabus as the "School History of England" published by the Clarendon Press (3s. 6d.) Like the books named by Prof. Hearnshaw, it is not as uniformly accurate as it might be, but at least it is comparatively free from "technical detail."

J. S. LINDSEY.

"Phaeacians" and "Sutors of Penelope."

"YOUR REVIEWER" in his reply to my protest says: "I shall be pleased to apologise for my misunderstanding if any classical scholar accepts his version as correct and free from ambiguity."

As I was writing to Mr. Walter Leaf, the well-known editor of the *Iliad*, I referred the matter to him. He writes: "I cannot see any ground for 'Your Reviewer's' criticism. At best the complaint can only be against Horace, for joining 'Sponsi Penelopes' and 'Alcinoi juvenus.' Your 'parasites of Alcinoi's' shows that you agree with me in taking Alcinoi as a genitive singular, and not as a plural, though 'parasites' seems a little hard, even on the Phaeacians. So I certainly accept your version as correct and free from ambiguity."

I hope that the above will satisfy "Your Reviewer," and that he will make the promised apology in your next issue. He can see the whole letter of Mr. Leaf, if he wishes.

WALTER COPLAND PERRY.

IN accordance with my promise, I have much pleasure in apologising for what Dr. Walter Leaf, a classical scholar, agrees with Mr. Walter Copland Perry, author of "Sancta Paula," in regarding as a misunderstanding on my part.

YOUR REVIEWER.

The School World.

A Monthly Magazine of Educational Work and Progress.

EDITORIAL AND PUBLISHING OFFICES,
ST. MARTIN'S STREET, LONDON, W.C.

Contributions and General Correspondence should be sent to the Editors.

Business Letters and Advertisements should be addressed to the Publishers.

THE SCHOOL WORLD is published a few days before the beginning of each month. The price of a single copy is sixpence. Annual subscription, including postage, eight shillings.

The Editors will be glad to consider suitable articles, which, if not accepted, will be returned when the postage is prepaid.

All contributions must be accompanied by the name and address of the author, though not necessarily for publication.

The School World

A Monthly Magazine of Educational Work and Progress.

No. 46.

OCTOBER, 1902.

SIXPENCE.

THE EDUCATION BILL AND THE FUTURE OF SECONDARY EDUCATION.

By Rev. R. D. SWALLOW, M.A.

Headmaster of Chigwell School;

Hon. Sec. of the Incorporated Association of Headmasters.

THE check in legislative activity, caused by the parliamentary recess, affords a suitable opportunity for reviewing the situation in which the educational world finds itself. It is seriously affected already by the creation of a central authority presided over, at last, by a Minister of Education with a seat in the Cabinet, and represented in the House of Commons by a Secretary whose appointment has been hailed with hopeful content by all who know anything of his public career, and with something more than this by those who have the honour of his acquaintance. An Order in Council for the Registration of Teachers has been added to the Statute Book, which is at once a step towards the unification of the profession, and an assurance to the public, that the efficiency of secondary teachers and schools is, also at last, regarded by Parliament as a matter of national importance. The Consultative Committee of the Board of Education, and a Registration Council, of which a majority of members are elected by Teachers, give an air of reality to what might have been otherwise merely political changes of administration. A third step has yet to be taken before educationists are satisfied that a real advance will be made; such an advance as was in the mind of Lord Taunton's Commission of 1868, and of Mr. Bryce's Commission of 1895. How decisively Parliament will put down its foot to this end is yet in doubt; but we hope that country and sea and moorland will so clear the minds of our legislators that, on their return to Westminster, they will not allow great imperial interests to be hindered by political and sectarian jealousies. There must be a mutual forbearance, and concession of personal prejudice, if the matter is to be brought to a successful issue.

And this is how things stand. The Bill in charge of the Prime Minister, which has already passed its second reading, is undergoing changes in Committee which make it something altogether different in character from the Bill which left the

hands of the draftsman. So far as we understood its meaning then, it asserted five principles, viz:—

(1) The necessity of a single local authority for all forms of education below the university, exercising jurisdiction over large areas.

(2) An option left with new local authorities between the absorption, the destruction, and the continuance of School Boards.

(3) The essential importance of rate-aid for impecunious schools.

(4) The maintenance of the *status quo* as regards religious teaching in secondary schools.

(5) The exclusion of London from the provisions of the Bill.

We do not discuss the value of these principles. We only notice that in not one particular has a Government with a majority of over a hundred votes been strong enough to maintain its position unimpaired.

The one local authority is no longer to be found. Boroughs with a population over 10,000, and urban districts over 20,000, are to be put on the same footing as counties and county boroughs for the charge of education, and for rating for the purposes of education, in their area. However satisfactorily this may work for elementary education, it cannot but be detrimental to schools of a higher type. In all these smaller areas there will be a tendency in secondary schools to gravitate to the board school, rather than the public school, tradition. There is no longer hope for the continued existence of school boards; and, however desirable may be their extinction in rural districts, the excellent working of the system in our great towns is undeniable, notwithstanding their tendency to usurp functions which do not belong to them. The financial burden has been shifted from rates to taxes, to the extent of nearly a million, for promoting the efficiency of voluntary schools. The Cowper-Temple clause has been flung as an apple of discord into the field of secondary education.

It is an open secret that Government designs a new education authority for London, to be created out of representation of the twenty-eight borough councils, which make up the metropolitan area, a *congeries* of representatives with which no other body is comparable, excepting the defunct and discredited Metropolitan Board of Works. But this is not yet before us, and Mr. Balfour may be wise in time. Enough has been said to prove the

mental indecision of the Cabinet on this momentous question, and the consequent inability of the profoundest critic to forecast the issue of events. Yet we are inclined to hope that the interests of higher education are safe in Sir William Anson's hands, although it is to him we owe the adoption of the Cowper-Temple clause for new secondary schools.

The world of Parliament seems altogether to have forgotten that the unsatisfactory condition of these schools was the *raison d'être* of an Education Bill, and has allowed itself to rage furiously on the question of religious teaching in the voluntary schools. When the storm has spent itself and more sober judgment prevails, we may hope to discover possibilities of future development in education for the advantage of the sons and daughters of the middle classes. If we attempt to strike a balance between those things in the Bill, as already amended, which make for progress in the region of higher education, and those which are futile to this end, if not actually retrograde, our views tend towards a cheerful optimism, especially as we remember that to muddle through difficulties, and to accomplish ends piecemeal, is quite in accordance with the English temper. We have this to write down in favour of the Bill. Several County Councils, noticeably that of the West Riding of Yorkshire and those of Essex and Berkshire, which may be regarded as representative of urban, sub-urban, and rural counties respectively, have shown a very enlightened desire to render efficient existing secondary schools by generous aid, as well as to make provision for secondary education where it does not exist. They have doubtless made grave mistakes, but they were new to the work, and their blunders are less serious, and their discretion more mature and wiser, every year. Moreover, they have been limited in the scope of their activity by subordination to provisions of the Technical Instruction Act, and they have been chosen from the members of the County Council for the promotion of technical instruction, and without any compulsion in the direction of the co-optation of members experienced in secondary education. For the future the scope of their usefulness will be enlarged. They will be called upon to deal with education as a whole, and not merely with its technical side; while they are required to provide "for the appointment, on the nomination, where it appears desirable, of other bodies, of persons of experience in education, and of persons acquainted with the needs of the various kinds of schools in the area for which the Council acts." It is true that this provision is clumsily drawn, and that it would be well to amend it further, so as to fix a *minimum* proportion of experts, and to lay down some definite instruction as to the manner of persons to be chosen. There is also an entire disregard of the claims of women to places on the Education Council, though it has been laid down authoritatively in the House of Commons that the term "persons" includes women. We may assume, therefore, that these are uncontentious details to be

dealt with by the Board of Education or by Order in Council. The fact remains that a more carefully selected committee, with a wider sphere for service, is henceforth to be in power.

Again, there is implied, if not actually stated, in those clauses of the Bill which have passed through the House of Commons already, the importance of giving substantial aid to those endowed schools which, because of agricultural depression or from other causes, have incomes insufficient to meet the requirements of their several localities. In this way there is a conservative attempt made to maintain the old traditions of our ancient Grammar Schools, while rendering them more and more apt to meet the modern developments of the new century. There is also the power by concurrent taxation on the part of county councils, and the councils of the non-county boroughs in urban districts, to increase considerably the means at disposal for secondary schools. But by far the most important novelty in the Bill is found in a reference in Clause II., as amended, to "the training of teachers," as being a part of the duty of local authorities. For at least a quarter of a century there has been a movement in the country to create training colleges, and provide other means for training teachers in secondary schools. So far as women are concerned, the movement has met with considerable success; but for boys' schools every effort has hitherto proved abortive. More than one training college has been started, only to fail for lack of men as well as of money. The Universities of Oxford and Cambridge have taken the matter in hand, and, under special delegacies and syndicates, have made an honest effort to enable men who know what to teach, to know also how to teach it, with the smallest waste of time and temper, and with the least loss to the taught. But few headmasters have given any encouragement, by their preference for trained candidates for assistant masterships; and this of course, because the supply of such candidates is small and not drawn from the men of most marked intellectual ability. The Bill, however, has forced the question into a foremost place, and the University of Cambridge has shown itself alive to its urgent importance. At the instigation of two or three of the more enlightened and progressive headmasters of public schools, the Vice-Chancellor has invited a small but representative Conference to discuss the matter about the middle of November. The action of this Conference must be materially accentuated by the amendment to which we have referred.

Last of all, the amended clause is no longer permissive, as originally drafted in the Bill,¹ and it now provides for the inclusion not only of the training of teachers to which we have already referred, but also of the general co-ordination of all forms of education. These concluding words of Clause II. seem to us to prepare for the evolution of an authority which will have from Parliament

¹ For the amended clauses of the Bill, see THE SCHOOL WORLD for August and September, 1902.

encouragement, as well as power, to carry into effect those far-reaching reforms for which earnest-minded educationists have been strenuously urgent. We must rely upon the common-sense of our new masters not to allow the opportunity to pass. For all these things we are profoundly thankful, and unwilling to seem ungracious, if we confess to disappointment in other provisions of the Bill, as well as in its omissions. To take the last first: there is in it nothing whatever to compel the very large number of private and proprietary schools to come into the new order; and in consequence of this we cannot but fear their gradual extinction, or the re-opening of the question for settlement at an early date. Worse than this, the great non-local public schools are specially exempted; nor is there anything to induce teachers in them, or even in the well-endowed local schools, to offer themselves for registration. There is danger, therefore, of continued division in the profession—the one part registered and presently trained; the other untrained and unregistered, but with social *prestige* attaching to it. We cannot but feel also that the financial provision is quite inadequate for the occasion, and that to ensure efficient reform the new Chancellor of the Exchequer must dip his hand deep into the Imperial purse. The poverty of schoolmasters is hardly less marked than that of the clergy. The prizes are few; and schools with the means to pension assistant-masters, or even headmasters, are still fewer. It is to be regretted, too, that governors of schools are ignored in the Bill, though this may be hereafter remedied under the clause which provides co-optative powers for the new local authorities.

The recent trend of public opinion has been in favour of regarding teaching as the work of laymen, and altogether, and not improperly, against rewarding success by ecclesiastical preferment. As a consequence of this, the best scholars in our universities are drifting away into the Civil Service and other professions. Unless Parliament realises quickly the importance of this defect, the supply of teachers of the right sort will cease.

A yet further demand must be made on public money for the endowment of scholarships, to enable the poor boy of marked intelligence to pass, if he will, from the highest standard of the elementary school of his native village, and to maintain himself at the best secondary school of his locality, and subsequently at the university most suitable for him. The entire disregard of the scholarship question seems one of the most regrettable omissions in the Bill.

Two fatal flaws in the Bill have been noticed already, and nothing more need be said about the unfortunate multiplication of local authorities, and the danger arising therefrom of degrading a considerable number of secondary schools to the ideal of the board school. Still more serious is the ill-advised intrusion of the Cowper-Temple clause, as unnecessary as it is ill-advised. There has never been a religious difficulty in secondary schools, and there is grave cause for fear lest, in this way, one may be created—*quod Deus avertat*.

NEW LONDON MATRICULATION SYLLABUS IN MATHEMATICS.

By C. H. FRENCH, M.A.
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THE object set before me in writing this article, is to make suggestions as to modifications in methods of teaching mathematics required by the new syllabus of mathematics in the Revised Regulations for Matriculation at the University of London, and also as to books which have been published dealing with such methods.

At the outset I should like to mention that at the time of writing I have had no opportunity of seeing how the examiners interpret the syllabus, as the first examination under the revised regulations will only take place a few days before this article is published; also in the matter of text-books, it must be distinctly understood that I only refer to such as are familiar to myself, without prejudice to other excellent works with which I am unacquainted.

For many years mathematical experts have condemned many of our methods of teaching, and gradual improvements have been brought about as a result of their strictures. Notably has this been the case in geometrical teaching in consequence of the suggestions of the Association for the Improvement of Geometrical Teaching. It may be of service to give the names of some recent publications bearing on the subjects which are to be considered in this article:

"The Teaching of Mathematics," by Professor John Perry, D.Sc., F.R.S. An address delivered to the Educational Science Section of the British Association, published in THE SCHOOL WORLD for October and November, 1901. (Macmillan.)

"Practical Mathematics." Summary of Six Lectures delivered to Working Men by Professor John Perry, D.Sc., F.R.S., issued by the Board of Education (1899).

The Report of the Committee on Mathematical Teaching of the British Association, just published (1902). (See p. 389.)

The Report of the Mathematical Association on the Teaching of Elementary Geometry (*Mathematical Gazette*, May, 1902).

The Report of the Mathematical Association on the Teaching of Arithmetic and Algebra (*Mathematical Gazette*, July, 1902).

"Reforms in the Teaching of Mathematics," by Mr. Fletcher (Liverpool Institute). Read before the Incorporated Association of Headmasters (1902) [THE SCHOOL WORLD, March, 1902].

The chapters on Algebra (Mathews) and Geometry (Workman) in "Aims and Practice of Teaching" (Cambridge University Press, 1897).

As a consequence of the energy thus displayed by mathematicians, there is a marked tendency on the part of some of the most important examining bodies to modify their syllabuses so as to recognise modern methods. This is so in the case of the Oxford Locals as well as the London Matriculation with which this article is especially concerned. Cambridge still remains, for the most part, unmoved; but it is hardly conceivable that this attitude will be maintained for long. Thus, it becomes necessary for mathematical teachers, who

have hitherto felt that they were bound down to methods of which they could not approve by the exigences of examination requirements, to take stock of their position, and to be ready to avail themselves of the greater freedom allowed.

The mathematical expert, whether examiner, or lecturer to picked bodies of men, or mere theorist, is probably an extremist, and does not realise the tempered enthusiasm which many boys display for school work, and their astonishing faculty for forgetting; but in so far as he is able to show us how to quicken the interest of these boys by making the subject more lifelike, or to sharpen their wits, as evidenced by greater grasp of principles or power of solving problems, or even merely to curtail the time necessary to acquire a certain knowledge of the subject without destroying its value as a mental training; then, indeed, he deserves the gratitude of mathematical teachers in schools for his attempts to ameliorate their lot.

I propose, now, to take the subjects of the elementary mathematics papers, which are compulsory for all candidates, as set forth in the syllabus, in order; and to make such suggestions as occur to me, in so far as space allows.

Many, if not most, of the readers of this magazine will probably find nothing very novel in what follows, but it may be of service to them to have the points collected together; while it is hoped that to others, who have given less attention to the subject, some of the suggestions may be really helpful.

ARITHMETIC.

Special stress is laid on the *Metric System*, our own barbarous system of weights and measures not being referred to. We, as teachers, should assist the movement by reducing the time spent over weights and measures in the early stages as much as possible, only dealing with those in most common use and avoiding long and complicated questions in reduction. Plenty of practice in the Metric System is afforded in most recent text-books in arithmetic, very full information being given in "The Metric System," by S. Jackson (Allmann). Also Layng's "Arithmetic" (Blackie) contains unusually good examples on this as well as many other portions of the subject.

Approximations to a specified degree of accuracy.—We cannot take absolutely exact measurements of any kind, and it is well for a boy to get familiar with this idea. In practical measurements accuracy beyond four figures is almost unattainable, and it is much to be desired that this should be generally recognised in examinations as well as elsewhere. In sums involving money the method of decimalising at sight should be generally employed, and, as a rule, answers should only be required to be correct to the nearest penny. Various rules are given in text-books for decimalising money. The rule given in Sonnenschein and Nesbitt's "Arithmetic" has the advantage that it gives the value to three or four places of decimals, or exactly if desired, and it is easily applied.

Since 1s. = £0.05, any number of shillings is

decimalised at once. Since 6d. = £0.025, and 6d. contains 24 farthings, therefore, 1 farthing = £0.001 $\frac{1}{4}$. Hence any number of farthings can be decimalised by considering them as in the third decimal place, and adding one twenty-fourth of that number. *E.g.*, 4 $\frac{1}{4}$ d. = 17 farthings = £0.017 $\frac{1}{4}$ = £0.017708.

In special cases slight modifications would naturally suggest themselves. It is very important also to practise reconverting a decimal of £1 into shillings, pence, and even farthings, which is to be done on the same principle.

A uniform practice should be adopted in dealing with such results as 0.7846, 0.7844; if required correct to three figures they should always be taken as 0.785, 0.784 respectively; and with 0.7845 it is better to have the understanding that, correct to three figures, it is to be taken as 0.785.

Contracted methods of multiplication and division of decimals.—It is desirable that pupils should be taught from the first, in multiplying, to begin with the highest digit of the multiplier.

In division, the method of placing the quotient over the dividend, instead of to the right of it, seems preferable for several reasons.

$$\begin{array}{r} \text{Thus,} \quad 786 \overline{) 478932} \\ \underline{4716} \\ 7332 \\ \underline{7074} \\ 258 \end{array}$$

I do not myself like the "Italian method" of division, because of the difficulty of detecting any error, although it looks very neat; but, from the first, pupils should be taught to do subtraction—and, of course, the subtractions in division sums—by the method of "complementary addition."

Contracted methods of performing multiplication and division are described in all modern text-books; hence it is unnecessary to explain them here. Sometimes the order of the figures in the multiplier is reversed, but there does not seem to be any real advantage in this, and there is considerable loss in clearness. All this part of the subject is most admirably treated in Workman's "Tutorial Arithmetic" (Univ. Tutorial Press), a book which every teacher of arithmetic should consult. In addition to testing the accuracy of products or quotients by "casting out the nines," pupils should be encouraged to use rough tests regularly, in order to see that there is a probability that their results are correct.

For advanced pupils, especially if they intend taking up an engineering or science course, it is very advantageous to have some practice with the slide rule. A skilful user of the rule can put down the value of such an example as $\frac{4.23 \times 5.67 \times 7.01}{8.93}$ in half a minute, correct to 3 or 4 significant figures.

Practical applications of Arithmetic.—Presumably this may be taken to include profit and loss, interest, discount and present worth, stocks, exchanges, areas, volumes, and miscellaneous problems.

ALGEBRA.

Here *graphs* is the word which has caught the popular eye, witness an advertisement in a morning paper: "Wanted immediate preparation in mathematics for the London Matric., graphs necessary."

A boy readily grasps the idea of determining the position of a point by its distances from two straight lines at right angles to each other, as in co-ordinate geometry; then, using squared paper, he can plot lines parallel to the axes, such as $x = 4$ or $y = -3$; next, by ascribing values to x and finding the corresponding values of y , he can plot such lines as $y = 2x$, $y = 3x - 4$, or generally of the type $y = ax + b$.

To apply this to the solution of a simple equation, e.g., $3x - 2 = 0$; put $y = 3x - 2$, and plot this line; the value of x when $y = 0$ gives the root of the equation.

By plotting two lines, such as $y = 3x - 2$, $y = -4x + 5$, and noting the values of x and y at their point of intersection, the method gives the solution of these simultaneous equations.

A few illustrations, showing that the points determined by finding the values of y corresponding to assigned values of x , when plotted on squared paper, do lie in a straight line, would convince the pupil that any linear equation in x and y denotes a straight line. He can then proceed to draw the graphs of other functions, such as $y = x^2$, or of the general type $y = ax^2$, $y = (x - 1)(x - 2)$ &c.; the method being to ascribe values to x and calculate the corresponding values of y . When a sufficient number of points have been determined in this way, draw a curve passing through them; this will be the graph of the function.

To exhibit the roots of a quadratic, e.g., $x^2 - 5x + 2 = 0$, one method is as follows:—

The equation may be written: $x^2 = 5x - 2$.

Now plot the curve $y = x^2$, and also the line $y = 5x - 2$. Note, say to one decimal place, the x co-ordinates of the points of intersection. These are the values of the roots of the quadratic.

Anyone who wishes to look into this matter carefully, or, indeed, into any other point connected with elementary algebra, should refer to Chrystal's "Introduction to Algebra" (Black): not the large work. Very useful hints as to solving equations and plotting functions by the use of squared paper are to be found in "Practical Mathematics for Beginners," by F. Castle (Macmillan), which is being enlarged so as to meet the requirements of the new Matriculation syllabus; also in Prof. Perry's "Lectures on Practical Mathematics," referred to on p. 363.

Symbolical expression of general results in Arithmetic presumably means practice in constructing and manipulating formulæ. Even or odd numbers may be represented by $2n$, or $2n + 1$, n being an integer. Represent two numbers by aF , bF , where F is their H.C.F. and a and b prime to each other; also their L.C.M. is abF .

Interest formulæ: for simple interest, $I = Pnr/100$; for compound interest, $M = P(1 + r/100)^n$, or $M = PR^n$, &c.

Proportion sums can be used for the construction of formulæ, e.g., if 35 men can do a piece of work in 12 days, working 8 hours a day, in how many days could 30 men do half the work, working 7 hours a day?

Using initials m, w, d, h ,

We have $d \propto w/mh$ or $d = kw/mh$, where k is a constant. (A little oral explanation soon makes this idea intelligible to boys, without working through a chapter on variation.)

$$\text{Now } 12 = k \cdot \frac{1}{35 \times 8} \text{ or } k = 3360$$

$$\therefore d = 3360 \times \frac{\frac{1}{2}}{30 \times 7} \text{ or } d = 8.$$

This kind of work is very valuable as a training in manipulation of formulæ, of which much has to be done by anyone who uses mathematics practically in after life. Such formulæ as circumference of circle = $2\pi r$, area = πr^2 ; volume of a sphere = $\frac{4}{3}\pi r^3$, or α cube of diameter, to put it in another form. Even some of the simpler physical formulæ might perhaps be admissible under this head, such as $s = vt$ for uniform velocity, $s = \frac{1}{2}gt^2$ or $s \propto t^2$ for falling bodies, &c., &c.

Algebraic Laws and their Application.—It is desirable that the pupil should have some clear idea as to what is meant by the commutative, distributive, and associative laws, as well as the index law for positive integers. Proofs of all the fundamental laws of algebra should be given in as simple a form as possible in the early stages, i.e., mostly by inference from arithmetic or geometry. Formal proofs are not understood by most pupils, and certainly not remembered in most instances. Explanations of these laws and proofs are to be found in most recent elementary algebras, e.g., C. Smith, Hall and Knight (Macmillan), and perhaps more simply done in French and Osborn (Churchill).

Harmonic progression is now required in addition to A.P. and G.P.

GEOMETRY.

For such students as have already made considerable progress with Euclidean geometry the obvious course is to continue on the same lines, paying special attention to types of riders specified in the syllabus, of which a sufficient number for practice can be obtained from most of the textbooks in common use.

The more interesting question is as to the best course to adopt with pupils who are about to begin the study of geometry, and possibly with those who have not yet made much progress in it, in view of probable future developments. As an illustration of the tendency of the movement compare the Oxford Local Examinations Regulations for 1903.

It seems to be generally admitted now that the study of geometry should be commenced by oral teaching and questioning, and by practice in measurements and constructive work as well as numerical examples. For this purpose the teacher may frame his own course, or he may avail himself

of the courses set out in the numerous books on the subject which are to be obtained, *e.g.*, Minchin's "Geometry for Beginners" (Clarendon Press), Nesbitt's "Inductive Geometry" (Swan Sonnenschein), Hamilton and Kettle's "First Geometry Book" (Arnold), Sanderson's "Geometry for Young Beginners" (Cam. Univ. Press). In these the constructive work is done with a graduated ruler, a pair of compasses, parallel rulers, a set square and a protractor.

This introduction to the subject does not repel the weak pupil; there is something to interest him and much that he can actually do.

After this introductory course has been completed, if the teacher have not before him the fear of examinations in which Euclid is compulsory, he may work his pupils through Fletcher's "Elementary Geometry" (Arnold), a book just published containing the substance of Euclid I.-IV., VI., treated on novel and instructive lines. I learn that the method has been fairly tested and found to produce satisfactory results in practice, judging by the way in which boys who have been through it learn to do riders, which is after all the ultimate test. Or, if the teacher be hampered by examination considerations, or be of a more cautious disposition, he will follow the introductory course by geometry on Euclidean lines. Yet there are many alterations he may make with safety and possible advantage; for detailed suggestions as to these he should see the *Mathematical Gazette*, May, 1902. Without professing to go into the matter exhaustively here, I may perhaps mention the following points as illustrations of what is meant:

In Book I., omit Prop. 7. Prove Prop. 8 by placing the triangles in opposition.

Introduce the term "congruent" for triangles "equal in all respects," as in Props. 4, 8, 26, and prove, in connection with these, that two right-angled triangles, which have their hypotenuses and one other side in each respectively equal, are congruent.

Prove Prop. 24 by use of Prop. 20 [this is the alternative proof given in Hall and Stevens (Macmillan)]. Substitute Playfair's axiom for Euclid's 12th axiom, and use it for the proof of Prop. 29.

After Book I., instead of continuing with Book II., it would be well to take Book III., 1-34, these Third-book propositions being for the most part easier than those in the Second Book and being independent of them. It is suggested that several of the early propositions in Book III. may be omitted, but as they are easily acquired by pupils, it does not seem to be a very important matter.

Book III., 9, follows at once from the later part of III., 7. Instead of III., 16, 18, 19, prove that "the tangent at any point of a circle is at right angles to the radius to the point of contact; and that only one tangent can be drawn at any point of a circle."

Instead of III., 17, show that "two tangents, and only two, can be drawn to a circle from an external point." Prove by describing a circle on the line joining the point to the centre of the given circle, and then using the property that the angle in a semi-circle is a right angle (this property is proved by First-book methods only).

After these take Book II., of which propositions 1-10 may be proved by algebra, instead of merely using algebraical illus-

trations. There should be no difficulty in the idea of denoting the length of a line by a single letter, and in expressing the areas of rectangles or squares, since the pupil will have had similar work with actual numbers in arithmetic.

If, however, the teacher dislikes the idea of entirely abandoning geometrical proofs for these propositions, there is a middle course open to him, without keeping the lengthy proofs in Euclid. Use Euclid's proof of Prop. 1; then take Props. 2, 3, as special cases of Prop. 1; Prop. 4 follows easily from Props. 2, 3; Props. 5, 6, from Props. 4, 3; Prop. 7 from Props. 4, 3; Prop. 8 from Prop. 4, 7; Props. 9, 10, from Props. 4, 7. The proofs in each case after Prop. 1 take only, at most, half-a-dozen lines, there being no construction necessary. Such proofs may be considered as geometrical, with the algebraical use of the + and - sign. There are various modifications possible. The proofs referred to above are to be found in Deighton's Euclid (Deighton, Bell & Co.).

Keep II., 11, 12, 13, 14, as in Euclid, showing that Prop. 11 is algebraically the solution of a quadratic equation, and in Props. 12, 13, use the projection form of enunciation.

After this finish Book III.

Book IV., 1-9, may really be taken at an earlier stage. It seems a pity to omit Prop. 10, as being an interesting proposition, but the later propositions may be taken as practical exercises in geometrical drawing.

Some useful hints may be obtained from a "Primer of Geometry," by H. W. Croome Smith (Macmillan).

DRAMATIC PERFORMANCE IN SCHOOLS.

By FANNY JOHNSON.

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"**O**UGHT we not (says Plato) . . . to seek out artists . . . who by the power of genius can trace out the nature of the fair and graceful, that our young men, dwelling as it were in a healthful region, may drink in good from every quarter whence any emanation from noble works may strike upon their eye or their ear, like a gale wafting health from salubrious lands, and win them imperceptibly from their earliest childhood into resemblance, love, and harmony with the true beauty of reason?" These words of the great theorist may well serve as a text for my paper, the object of which is to point out the use of the school entertainment, or play, as a factor in education.

"Entertainments" are probably becoming more and more prominent as a feature, though perhaps not a seriously recognised feature, in school life. There are, of course, many occasions in a child's life, whether at school or at home, when the word entertainment, or the thing, can be properly used in the sense of mere amusement. In boarding schools especially, dramatic and musical performances of a more or less ambitious kind are a useful safety-valve when organised entirely by pupils, and are even indirectly valuable as character training. But for a teacher to take such occasions too seriously would be to rob them of half their

charm, and of all their value. It is otherwise with the set and public functions which, under the name of Speech Day, or Westminster Play, or whatever it may be, are part of the Ritual, as it were, of every properly-constituted school. Plato considered "imitation," *i.e.*, dramatic performance, as the basis of very much that is essential in education. We have travelled a long way from such a notion, and it may be worth considering whether we should retrace our steps. It often seems to us moderns, indeed, that the borderland between good and evil in dramatic spectacles is so faintly marked that one can understand the Puritan who eschewed them altogether, while one sympathises with the Ritualist or Mystic, to whom they are of the essence of life.

The pitfalls in connection with the school play are: (1) that it should be used to display the best-looking, and most talented, perhaps even the most socially important pupils, and so degenerate into a mere parent-catching device; or (2) that it should be allowed and tolerated as mere amusement, and so an inferior taste engendered and a low standard of acting admitted. And of these evils the latter is the greater.

The right way is to return in spirit to the origin of all drama, and make of it a religious festival. And first, the function should "celebrate" an anniversary, the Day of the Founder, or of the Opening of the School, or of the first Headmaster, or Headmistress. Part of it should be definitely commemorative, in the form, or at any rate in the spirit, of a "Bidding prayer"—a reminder that the body, of which the present pupils are members, is an entity, apart from their individual existence. The performance itself should consist of a single play, or at the most of two short plays, whole in themselves, rather than of a number of dialogues, or "selections." For the interest of players and audience must be directed by all means to the performance, and withdrawn as far as may be from the performers. The piece should be most carefully chosen, and its intrinsic merit must never fall below the level of literature. A classic, whether ancient or modern, whether in the native or a foreign language, it must be, and if of foreign origin, I would prefer a good translation, so that it may be comprehensible by all, for the celebration must be felt to be the business in one way or another of the whole school. As many pupils as possible should be cast for a part, and if the school is very large, the selection of players should be representative of the whole, and not confined to a few, or to the upper forms. Others who are left out of the play can be employed to prepare costumes or to attend to properties, &c. I have known when a school was revitalised by spending practically the whole of one term in preparing Shakespeare's "Julius Cæsar" for performance. Idle or ill-disposed children found themselves working with and for the cause; the dull discovered unexpected talents, and the plain developed unknown graces.

But while the choice of a play should be as ambitious as you please, there should be no

toleration of slovenly performance. The easy admiration of the parent for the clever child who can actually "remember all that" must not be the criterion of merit. There must be a definite and serious study of the dramatic art, and it is here that the school play, as a rule, is apt to break down. We have screwed up the standards in many directions. A certain modicum of real acquirement is now the rule, and not the exception, in subjects which "admit," as the saying is, "of examination." Even in the arts, in piano playing and drawing, at any rate, much improvement has taken place of late years. Pupils of various schools are compared together, and their performances are submitted to the judgment of experts. A similar movement is required, it appears to me, in the direction of the drama. The trouble here, among other things, is to decide who *are* the experts, for even members of the profession have, as a rule, "picked up" their trade. On the other hand, every teacher is bound to be something of an actor, and if teachers were more alert in this matter, they would study the best methods of voice—breath—gesture and—in general, of *body-training*, from the point of view of drama, just as they now study the best methods of teaching other subjects. The first requisite is to encourage sound criticism of performances. It would be useful to employ a dramatic critic to visit various schools, and report upon them as he would upon the theatres. His criticisms with regard to particular schools need only be communicated privately to the principals, but a general account of defects or merits common to several might be presented in the form of a report to a representative body of the teaching profession, who could use it as a basis for action. At present each school works independently, and it may be that here and there, unknown to the world at large, some excellent work is being done, the fruits of which might be reaped with advantage in other places.

I have implied that the play should be an integral part of school work. The *words* should be made the intimate possession of pupils as a whole, even though few may be chosen to bear a final part. Few formal rehearsals will be needed if the work is taken quietly in the course of the ordinary curriculum, and at some of these it will be instructive for non-performers to be present. Teachers should, as a rule, abstain from taking actual part in the performance. It must be borne in mind that "the play is the thing," and though the best possible rendering should be aimed at, nothing could be more aesthetically disastrous than that the teacher should pose as the "star" actor. On the other hand, I recently witnessed a performance of an Elizabethan play by an employer of labour and his guild of working boys, in which the principal parts were taken by the persons of superior social position, while the members of the guild, who stood in the position of pupils, filled the gaps. Partly, no doubt, from having to play the subordinate parts, a singular freedom from self-consciousness, and a pleasing *naïveté*, the first qualifications of young actors, were shown by the latter. They

appeared to have a genuine and salutary, but by no means servile, admiration for the principals which augured well for the cause of their art. But, above all, they had evidently imbibed a love for the play itself as a beautiful piece of literature. Love of good literature is, doubtless, by no means uncommon in our schools, but the drama is a composite art, and, though the right spirit may have been aroused, there are still a whole host of details that need attention. A teacher, as I have said, must needs be something of an actor, yet many teachers have only acquired one requisite of the actor's art, the power to speak clearly and pleasantly on a public stage. Hence clear enunciation may, as a rule, be looked for even now in school entertainments. Further than this, so far as I have observed, the average school play does not attain.

The "staging" of a play is a more difficult affair, and one which demands the manager and artist "born, not made." Some excellent hints towards this are given in a stage arrangement, by Miss Elsie Fogerty, of Tennyson's "Princess" (Sonnenschein). She insists particularly on the careful nourishing of spontaneity and naturalness in the performers. In general, it is good to aim at a noble simplicity of staging, always remembering that the best pieces to a great extent "play themselves." The recent and most interesting performance of the Morality, "Everyman," by Mr. Ben Greet's company, lacked, to my feeling, this very *naïveté*, which might have been attained by a company of "young eyases," as Hamlet called them. With regard to costume, the same rule of simplicity holds. The costumes should be made on the school premises, under the direction of the teachers, and the expenses, which should be reduced to a minimum, might be met by a very small subscription, or by some special fund, so as not to fall as a burden on the least wealthy. The study of archaeological details in connection with costume and scenery (which, like the dresses, should be school-made) should be encouraged as a real study, the efforts in this direction not being left, as sometimes happens, to the labour of the teacher alone.

Where music and dance form part of the essence of a play, as *e.g.*, in the "Tempest," pains should be taken to bring these portions up to the level at least of the spoken parts. The weakest side of most school performances is their class or chorus singing. One has seen a group of children standing to sing with heads bent down, singing (if it can be called "singing") entirely from ear, while the teacher vainly flourished a *bâton*, to which not one gave heed. The quality of voice production, too, leaves much to be desired. More often than not there are "forty" singing "like one." The experiments now being made, under the auspices of Mr. W. B. Yeats, of speaking to the Psalter, may have some effect in inducing a fuller quality of speaking voice, and a more rhythmical and delicate method of acting, and such experiments might be tried in the ordinary schools. So with the dance, the performance of which by school children in public is not without its danger. Perfection and

beauty, dignity and simplicity, must be the aims; to dance, as it were, "before the Lord," as David did, and to sing in the spirit of the "sons of the prophets."

In fine, I look to the school play, if rightly managed, in the end to revolutionise the theatres, first by the cultivation of a taste such that many pieces which now enjoy a high popularity would never see the light; and, second, by such a high level of performance that the actors of the future will pass straight from the ordinary schools and places of "sound and religious education" as do the clerks and scholars and men of science of the present. And if this were not so, the effect of having played a noble part in a noble play is of incalculable benefit. To build up a school capable of performing dramas in the manner and spirit I have indicated, is a task worthy the effort of a lifetime. For children so accustomed to "imitate," to use Plato's phrase, would be imperceptibly won to "*resemblance, love and harmony with the true beauty of reason.*"

PHYSICAL TRAINING IN SCHOOLS.

By THOMAS CHESTERTON.

Organising Teacher of Physical Exercises for the London School Board.

III.—CHESTERTON'S DRILL AND PHYSICAL EXERCISES.

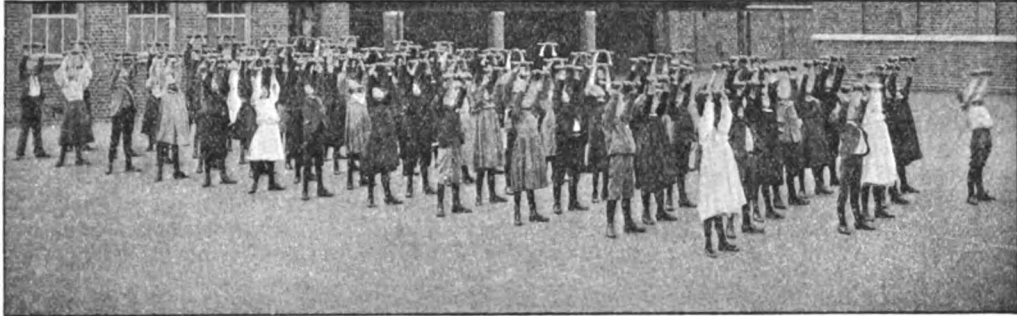
IT is highly irrational, under the existing extensive curriculum of elementary schools, and the limited time during which the children are under the control of the teacher, to attempt to carry out an elaborate system of physical training during school age. It is chiefly the above consideration which led to the compilation of Chesterton's system of Drill and Physical Exercises. The system is both eclectic and synthetic, the scheme drafted claiming to be of the highest physical value, while no hesitation has been felt by the author in availing himself of the assistance to be derived from many other systems. The system is one compiled solely for the use of school-children of either sex, and in its compilation the author has brought to his aid an experience of upwards of thirty years in teaching all branches of physical culture. There is no claim to originality, the adaptation and classification of the exercises being the only part which is original. The classification is the result of a close study of the chief anatomical and physiological features of the body, and was made under expert medical supervision and advice. The system is thus a scientific one.

The classification has regard to the fact that each class in a school consists of a large number of children of varying age, physique, and social position; hence the exercises are adapted to suit the requirements of the average child of school age. Each exercise serves some physiological purpose, nothing being introduced for the sake of display.

The exercises can be performed by the scholars whilst dressed in their ordinary clothing, and can be acquired by the teachers under similar conditions. No movements of a grotesque character are introduced, and nothing is employed which necessitates the hands or any part of the children's clothing coming into contact with the ground.

ways without any alteration (1) as free movements by words of command or numbers, (2) by the aid of dumb-bells, (3) with or without dumb-bells to musical accompaniment, (4) as a silent drill when two or more classes occupy the same room.

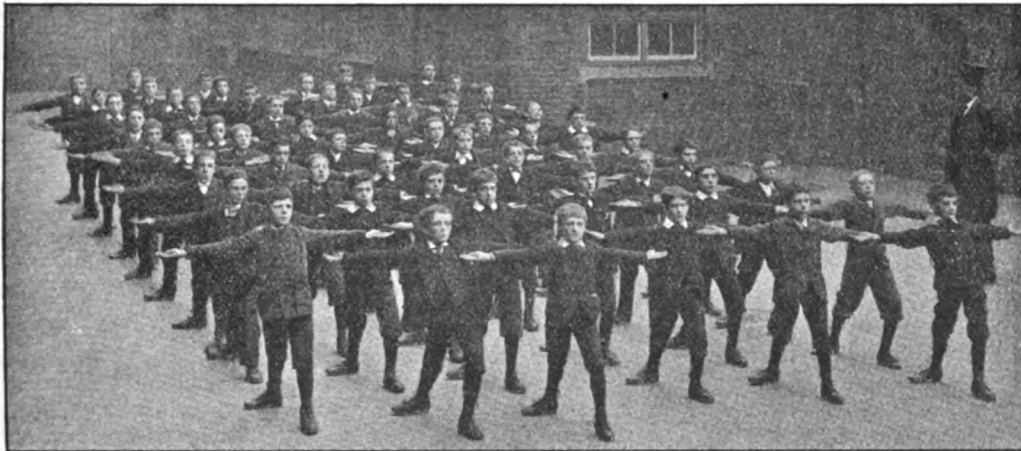
Staves, wands, or bar-bells can be introduced with but slight alteration of the exercises. The



Chesterton's Drill and Physical Exercises.—Dumb-bell Exercises. Cavendish Road Board School, London, S.W.

There are no movements of a complicated character, and not one which cannot be taught to a class of children in a few minutes, providing the exercises are taught in their progressive order. The object throughout is to produce general, all-round development, and the strengthening of the various organs—particularly the heart and lungs—on which a large part of the functional activity of the body depends. The system admits that the con-

ercises are arranged in the simplest manner possible in order that they may be easily learned by the teachers, who can readily select from them those most suitable for their scholars. All exercises are taught in two, four, or eight movements, and are so arranged that both sides of the body are equally exercised, either alternately or simultaneously. The first practice in each group is a lateral movement, and every exercise has a cautionary



Chesterton's Drill and Physical Exercises.—Free Movements. Battersea Park Road Board School, London, S.W.

stitution of a growing child requires all its nutrition for natural development; therefore muscular development is not the chief aim in view, though this is undoubtedly the result of regular and systematic physical exercise.

The exercises are arranged in a progressive form, commencing with the most simple movements, and gradually leading up to those of a more advanced nature. The exercises can be taught in different

word of command peculiar to itself which, in every instance, indicates what the executive word of command is to be.

The exercises are arranged as follow:—Commencing positions, head movements, straight-arm movements, bent-arm movements, trunk movements, trunk and arm movements, leg and hip movements, lunging, lunging with arm movements, balance movements, shoulder movements, exer-

cises when marching in various formations, figure marching, and respiratory movements.

Tables of exercises are entirely absent. The system being a simple one, the teachers can teach it without continual reference to a text-book; consequently they have a free hand in varying the exercises according to circumstances. Monotony is therefore absent, increased interest and benefit being the result. Still a table of progression is given, beyond which teachers should not proceed with their pupils.

A limited amount of military drill is used as an auxiliary to the physical exercises. By it the children are taught how to assemble, to form classes, and to move from one point to another in an orderly manner. This drill, although based on that contained in the Infantry Drill Book, is slightly modified to meet the requirements of children, and nothing is taught which is not essential to the purpose.

It is erroneous to suppose by the foregoing that the system is a military one, although all the exercises contained in the military system of physical training are found therein. The exercises are grouped into more complicated series in the military system, while in the system under consideration we have the elements from which the military system was compiled. The latter was compiled for adults, the other was evolved for children.

By adopting this system the author claims that it is possible for a teacher to give briefly the orders for the most complicated movements and be clearly understood. All the muscles are brought into play in turn, and thus uniform development is attained, the result being a healthy body in the true sense of the term. A change and relaxation from mental studies is effected, whereby the brain is at rest, and the circulation of the blood is accelerated after its partial stoppage during sitting at lessons, while a degree of freshness and energy is afterwards apparent in the ensuing work. The natural craving for exercise and rhythmical movement is satisfied, and the pupils finally become prompt in performing movements, and consequently acquire habits of deportment, becoming more graceful in their movements, and without hesitation responding to commands. Smartness consequently becomes habitual, and the discipline and tone of a school are raised.

The system is widely known and has been extensively adopted throughout the country. The army authorities have adopted it for all their schools at home and abroad. It is also taught to the students of ten training colleges for teachers, and in the London Board Schools and those of numerous provincial boards.

SPINOZA'S almost fierce denunciation of ascetic contempt for the body turns upon the conviction that the well-nurtured body is the organ of all true development, because it brings its possessor into varied practical relations with experience. On his view, to macerate the body is thus to starve the soul.—John MacCunn.

THE FRENCH ARMY ENTRANCE EXAMINATIONS.

By DE V. PAYEN-PAYNE.

IT may be interesting at the present moment, when the regulations for admission to the English army are in the melting-pot, to consider the new regulations that were adopted in December of last year for admission to the "École Militaire de St. Cyr"—the French "Sandhurst." Here are educated the officers for the Infantry, Cavalry, and the Colonial Forces. The course lasts two years, the fees for tuition and residence are £40 per annum, while the outfit costs from £24-28. Many exhibitions are granted, however, which pay the whole or half of these fees.

A candidate has to be of French birth, and between the ages of 17 and 21; he must also have passed the first part of the *Baccalauréat*, an examination which may be compared to our former London Matriculation. Among the documents that the candidate has to forward with his application is one from the military authorities attesting his physical fitness for military service. This strikes one as better than our system, by which a candidate undergoes his Medical Examination only after he has been successful in the Literary. Many candidates are rejected by the medical authorities, which thus leads to much waste of time and money.

The examination is divided into three parts, one written and two oral. This year the written examination lasted from the 5th to the 9th of June. The first oral took place on the 30th of June and the second oral on the 10th of July. The hours of the written examination would astonish some of our Sandhurst candidates. They are as follow:—

June 5th.—7.30-10.30, French Essay. 1.30-4.30, German (translation and composition).

June 6th.—7.30-10.30, Mathematics. 1.30-2.30, Logarithms. 2.35-4.35, Freehand landscape Drawing.

June 7th.—7.30-10.30, Descriptive Geometrical Drawing. 1.30-4.30, History (including Historical Geography).

June 9th.—7.30, Optional Modern Languages.

The first oral examination is the complement of the written work and the marks do not count in the total, but a candidate has to make a certain proportion in the written and first oral examination in order to be admitted to the second or competitive oral. Each candidate at the first oral is examined for twenty-five minutes.

The syllabus required is:—

(a) History of France from Henry IV. to the present day.

(b) Translation into German, reading German autographs, unseen translation and conversation.

(c) Mathematics, arithmetic, algebra (to progressions), plane and solid geometry, elementary geometrical conics, projective geometry, trigonometry (to solution of triangles).

(d) Elementary Mechanics.

(e) Elementary Heat, Light and Electricity.

(f) Elementary Chemistry.

- (g) Elementary Astronomy and Topography.
- (h) Optional Modern Languages (translation into the language).

The full marks allotted to each subject is 20, and a candidate's marks are multiplied by the following coefficients:—

I. WRITTEN EXAMINATIONS.		II. ORAL EXAMINATIONS.	
1. French Essay	10	1. French	2
2. History	10	2. History	16
3. Mathematics	14	3. Geography	14
4. Logarithms	2	4. German	10
5. Descriptive geometrical Drawing	5	5. Arithmetic	8
6. Freehand Drawing	4	6. Algebra and Trigo- nometry	15
7. German composition	8	7. Geometry	12
8. German translation	4	8. Descriptive Geometry	6
		9. Astronomy, Topogra- phy and Mechanics	10
		10. Physics and Chemistry	14

III.—PHYSICAL EXAMINATION.

1. Riding	2
2. Fencing	4
3. Gymnastics	6
Total, 176.	

It will thus be seen that the chief differences between the French and English examination are:

(1) The importance of the oral examination, to which twice as many marks are given as to the written examination. Many subjects, such as the sciences, have no written examination at all.

(2) The marks given for physical exercises, a plan which has been advocated in England for some time.

(3) The few subjects required in the written examination, and the absence of optional subjects.

After all, it is not so much the regulations which matter, as the spirit in which they are carried out. Compulsory military service in France renders the competition for the commissioned ranks very severe; and the majority of French officers are hard workers and take an intelligent interest in their profession.

SCOTTISH UNIVERSITY REFORM.

WHEN the Universities (Scotland) Commission was appointed in 1889, it was hoped that the results of its labours would be to place university education upon a thoroughly satisfactory and permanent basis. That the Commissioners in great measure failed to realise these expectations is now notorious, and the outcome of their deliberations as embodied in the Universities Act of 1899 has never been accepted by reformers within or without university circles as a satisfactory or final settlement. It will, however, be generally allowed that the Act of 1899 marked an important advance on previous conditions, and prepared the way for the more radical reforms that are now calling for settlement. The institution of a preliminary examination, the transference of the powers of initiative and government from a close corporation like the Senate to an elective

body like the University Court, the introduction of options for graduation in Arts, and the admission for the first time of women students, were reforms sufficiently notable to entitle the Commission to an honourable place in the history of university reform. But ten years' experience of the working of the new ordinance has shown that the new scheme has many of the defects of the old, whilst it has developed others, more serious, peculiar to itself. Apart also from specific defects, it is very apparent that the universities require reorganisation upon modern lines. If the Scottish universities are to retain their traditional supremacy and their old-time influence upon the national life, they must bring themselves more into line with great modern universities like those of Birmingham, Liverpool, and London. In education, as in every other sphere of national activity, it is true that—

Emulation hath a thousand sons
That one by one pursue; if you give way
Or hedge aside from the direct forthright,
Like to an entered tide they all rush by
And leave you hindmost.

The most hopeful sign in the present situation is the recognition from within the universities themselves of the inadequacy of the present curriculum to meet the changed national needs. Previous reforms have in great measure been forced upon the universities from without, and have only been gained after a bitter and protracted struggle. The omens on the present occasion are favourable for a speedy and satisfactory solution of the university problem. The Faculties of Arts of Glasgow and Edinburgh Universities have recently issued reports upon the reorganisation of the curriculum. The conclusions arrived at in both cases are in general harmony, though the reforms suggested are of vital and far-reaching character. To Glasgow University belongs the credit for initiating the first concerted steps towards a new reform. A remit had been made to the Arts Professors there regarding a summer session in Arts, and the Professors thought the occasion opportune for reviewing the whole of the present arrangements for university education so far as the Arts course was concerned. The outcome of their deliberations was embodied in a report which was made public over a year ago.

This report begins by pointing out certain changes in the conditions of the university problem now as compared with 1889. The institution of the preliminary examination has relieved the universities of most of the elementary work which they had formerly to undertake. The marked rise in the general level of secondary education resulting from the introduction of the Leaving Certificate has necessitated a corresponding rise in the level of university attainments. The work of the students in Arts, however, is compressed into too short a period to allow of this being satisfactorily secured. It may here be noted that the duration of the academic year in the Arts Faculty extends only from October to March, a period of twenty teaching weeks. This, undoubtedly, was a necessity

of the conditions of life long existent in Scotland. The Scottish universities have all along been national institutions where peer and peasant sat side by side in the same classes. The picture of the frugal Scottish youth spending his long summer vacation in hard manual labour that he might earn enough, to proceed to the university in the ensuing autumn is not one whit overdrawn, as the history of many a notable Scotsman shows, but it is no longer true to life, and is fast becoming a mere tradition. The University Preliminary is too severe a task-mistress to be wooed in this whole-hearted but half-time fashion, and it is felt on every hand that the arrangements of the university course should no longer be framed to suit a class which is either non-existent or rapidly becoming so. The report proceeds to show how during the present short session the whole time of the students is taken up listening to lectures and sitting for examinations. There is no time available in which the student may read and think and work in the subject on which he is receiving lectures. The result is that in many cases he comes to regard the lectures as a compendium of all that should be known of the subject—a meat extract that contains all the invigorating and strengthening qualities of the original ox. As Huxley puts it, "The students work to pass, not to know, and outraged knowledge has her revenge; they do pass and they don't know." The report concludes by advocating the extension of the present session by a third term of seven or eight weeks, making the academic year run from October to June, with breaks at Christmas and Easter.

The report of the Glasgow Faculty was forwarded to the Arts Faculty in Edinburgh. In considering it, the Edinburgh professors thought it best to discuss the whole question of the Arts curriculum and not merely the single issue—the extension of the academic year—of the original report. Naturally so wide a range led to a protracted discussion, but the comprehensive nature of the resulting report more than makes up for any delay occasioned thereby. At the request of the Senate, Professor Chrystal, Dean of the Faculty of Arts, undertook the task of preparing a public report of the proceedings and of the conclusions arrived at. It may safely be asserted that in the long and weary history of the university reform movement no such important and weighty document has ever been issued either from within or from without the university. No apology need, therefore, be made for briefly summarising its leading features.

DEFECTS OF THE PRESENT CURRICULUM.

(1) One of the main defects is that the work of the students is compressed into too short a period of the year. The student sits day by day in the lecture-room, and a series of pictures are thrown on his mind, like lantern views on a screen, each vanishing before it has had time to fix the attention. Lectures to be effective must be broken and assisted by exercises, by recitations, by reading, by reflection, by revision, all done by the student himself, and also supplemented in varying degrees according to the subject by tutorial instruction.

(2) The great variety of the subjects of the ordinary degree, their want of co-relation, and the possibility of taking each of them separately, encourage the student to skim over each as rapidly as possible, and to dismiss each successively from his mind.

(3) The strain of the high-pressure work of the winter session tests to breaking point in many instances the health of both students and professors.

PROPOSED ALTERATIONS IN THE ARTS CURRICULUM.

(1) It should be made possible to extend the courses that qualify for the degree of M.A. over a longer portion of the year, say from October 1st to June 30th.

(2) In the interest of students who are willing and able to do sustained work on particular subjects, some concentration should be allowed with a corresponding degree of relief from the compulsions of the present curriculum for the ordinary degree of M.A.

(3) A greater variety of honours groups should be recognised, and graduation in honours in more than one group fostered by greater exemption from subjects taken on the ordinary standard.

(4) To economise the energy of the students and give a higher tone to their class work, the example of the American universities and of the new Birmingham University should be followed of allowing class work to count in part for graduation under such limitations as may be thought desirable to prevent possible abuse.

(5) To provide for the greater length of the courses, and to indemnify the university for the loss of fees caused by the abolition of the present summer classes, an increased fee might justifiably be charged.

The conclusiveness and authority of the above scheme justify the hope of speedy legislative amendment on these lines, which would settle, at least for one or two generations, the vexed question of university reform.

EDUCATION AT THE CAMBRIDGE SUMMER MEETING, 1902.

(FROM OUR CAMBRIDGE CORRESPONDENT.)

IN the September number of THE SCHOOL WORLD, some account of the general scheme of the Summer Meeting this year was given, and also some impressions of the actual work done during the first half of the meeting. A few notes on the Education section of the meeting may prove interesting, but in writing them I find myself embarrassed simultaneously by wealth and poverty of matter. By poverty, because though I attended some sixty lectures or conferences, they by no means coincided with the sixty meetings to be included in the Education section. By wealth, because nearly all the Education proceedings at which I "assisted" were extremely suggestive.

These proceedings naturally fall into two main divisions, historical and practical; and the latter again fall into two well defined groups, literary and scientific. The Introductory Lecture hardly comes under any of these heads. It was delivered by

Dean Stubbs, of Ely, on the very first day; it was entitled "The Use of Poetry in Education"; and its value may be approximately estimated from its conclusion, "Life is the stuff out of which poetry is made, and poetry is the stuff out of which life is made."

I. THE HISTORY OF EDUCATION was treated in four lectures on "Educational Reformers" (Thomas Arnold, by Dr. A. Sidgwick; Horace Mann and Henry Barnard, by Prof. Foster Watson; Pestalozzi, by Mr. J. Russell; Herbart and his Followers, by Dr. F. H. Hayward); in an address by Canon Lyttelton, of Haileybury, on "Educational Progress in the Nineteenth Century," and in a lecture by M. Kuhn on "Secondary Education in France," in which a methodical and appetising syllabus was provided; but the sudden shifting of the time of lecture (a rather common feature of the latter part of the meeting) compelled me to miss it. Canon Lyttelton's address was, as usual, stimulative and even provocative. He began by enquiring for a suitable test of "educational progress," and tore to shreds the common complacent idea that, as we spend so much more money on "education" than our fathers did a century ago, we must necessarily have made progress in education. He was convinced, however, that real progress had been made in secondary education, especially at the great public schools; he thought it possible that there had been some real progress in girls' education; but he was not at all sure that there had been a very real advance at all made in elementary education.

II. THE PRACTICE OF EDUCATION.—The opening conference on the question, "How far can the school be a preparation for life?" was marked by an inspiring address by Mr. Sadler, but was otherwise neither entertaining nor illuminative. Sir Richard Jebb, the chairman, conspicuously failed to keep the speakers to the point; and his opening speech did not rise above the ordinary level of chairmen's openings. Among the many striking features in Mr. Sadler's address was a glorification of household management as a difficult and beneficent art which was well worthy of receiving more attention from those responsible for the education of our girls. Somewhat similar was the burden of Miss Ravenhill's extremely clear and delightful address on "Hygiene as a Factor in National Education." Perhaps one may also mention appropriately in this place the discussion on the connection between "Village Libraries and Popular Education." Lady Verney's opening paper was full of practical suggestions, made by a woman of experience, towards providing antidotes against the "gutter literature," a demand for which seemed to Canon Lyttelton a prominent result of our "system" of elementary education.

More directly "practical" than the lectures and discussions on general principles was a large number of meetings devoted to the consideration of actual problems in teaching, especially in regard of nature study, geography, and modern languages. I understand that crowds paid the special fees required for the first two of these courses, and were

diligent in attendance. I heard golden opinions expressed by foreign visitors concerning the work done by Mr. J. Russell and Professor Moore-Smith in the English classes for foreign students. Professor Patrick Geddes gave an "Introductory Course of Nature Study," consisting of six lectures with afternoon excursions, and many profited by his catholicity and enthusiasm. Professor Geddes is never tired of denouncing mere bookishness and "cold and pickled information," and his ideas, whether practical or visionary, are wonderfully attractive.

Besides the courses on nature study, Miss von Wyss, of the Cambridge Training College, gave three illustrative lessons to real children on the Water-Spider, the Caddis-Fly, and Poppies respectively. These lessons, though subjected by certain elementary teachers present to comment which struck me as neither courteous nor relevant, certainly interested both the children under instruction and also the majority of the onlookers; and they served to show in a practical way how such lessons could be given to town children or to children in the class-room. In her first lesson, for instance, Miss von Wyss supplied each member of her class with a bottle containing a water-spider in a close reproduction of its natural surroundings, and elicited much information and many ingenious conjectures from her class. Incidentally the lesson demonstrated the necessity of such lessons by exhibiting a common absence of powers of observation; for, after gazing at the spider for nearly half an hour, only half of the pupils were able to state accurately how many legs it had.

The question of modern-language teaching was less exhaustively treated, and for the most part what was said would not be new to readers of THE SCHOOL WORLD. Professor Walter Rippmann's brilliant address at the opening conference on the subject added little to what was contained in his articles on teaching French in the early numbers of this paper; and Miss Ainslie's first lecture on different methods of teaching modern languages was very similar to the American Report on that subject summarised in these columns in July, 1900. Miss Ainslie's two model lessons in French, however, were generally acknowledged to be models—not easy to criticise, less easy to imitate, and still less easy to better. The departure of Miss Ainslie and Miss Punnett will be a heavy loss to the Cambridge Training College, and a corresponding gain to Edinburgh and London respectively.

WHY is the relation of headmaster and colleague harder to fulfil than those of master and apprentice, banker and clerk, colonel and subaltern, rector and curate, and others whom civilisation has yoked together, not equally, in service? Partly because time has not yet settled these relations as it has settled others. No one thinks a colonel has a right to dismiss a company officer, and no one thinks of allowing the right of appeal against dismissal to an unhandy stable-boy. . . . We have not written even in water the name of the bond between headmaster and colleagues.—J. H. Skrine.

OXFORD LOCAL EXAMINATIONS, 1902.

Hints from the Examiners' Reports.

IN their reports, printed at the end of the "Tables Supplementary to the Division Lists, 1902," which have now been published, the Examiners for the Oxford Local Examinations indicate certain general weaknesses of candidates, and point out directions in which the teaching next year may with advantage be improved. The most important of these criticisms are collected below in such a form as will enable teachers quickly to acquaint themselves with the points deserving attention.

RELIGIOUS KNOWLEDGE.—The answers of *junior* candidates to the questions on "Samuel" showed that too much reliance has been, in many cases, placed on notes of lessons rather than a study of the actual text. The papers on "The Acts" indicated that there is need of more practice in writing out answers to encourage greater accuracy and clearness of expression. The chief weaknesses of *senior* candidates were those in the "Greek Testament" papers: they are (1) a tendency to reproduce the English version rather than to translate the Greek; (2) a strong tendency to speak of the grammar of the "New Testament" as though it were to be praised or condemned according to its agreement with or difference from the Attic standard; (3) failure to recognise that differences between the authorised and revised versions are often due to differences of reading, and not merely of rendering.

ENGLISH LANGUAGE AND LITERATURE.—In the GRAMMAR papers, *preliminary* candidates were liable to confuse adverbs and prepositions. Not a few of the *juniors* seemed to have very far from clear apprehension of the meaning and application of the terms printed on the "Form for Analysis." The weak point in the advanced papers of *senior* candidates was the parsing; this was not due to inadequate knowledge, but many pupils had in their minds no definite scheme to serve as a model.

The most serious defect in the ENGLISH AUTHOR papers of the *preliminary* candidates was in the answers to the questions on Macaulay's "Lays," where poetry was written without any regard to division into lines, or punctuation of any kind. Both *juniors* and *seniors* showed weakness in describing the characters of personages in their prescribed book; when asked to describe a character, they gave instead a list of events in the life of their subject.

The chief faults in the ESSAYS of *junior* candidates were: (1) irrelevance (a large number of the compositions would have fitted various kindred topics); (2) want of arrangement and method. Ideas were put down without any method. Minor defects were tendency to a conversational style, neglect of punctuation, and a very loose use of such particles as "and also," "then again," "as," "once," "because," "for," "therefore," and "vice versa," and the misuse of participles without

any grammatical coherence with the structure of a sentence. It should be impressed upon *seniors* "that quality is infinitely more important than quantity, and that half the time employed in writing four pages of bald truism would be better spent in trying to impart vigour and individuality to two." The punctuation, especially the use of the full stop, was very uncertain; and, in the majority of cases, the essay ended abruptly.

HISTORY AND GEOGRAPHY.—In the answers of *preliminary* candidates to the questions in English HISTORY there was a tendency, as in past years, to dwell upon unimportant details and to write lengthy anecdotes, with little attention to salient facts. The clauses of Magna Carta, for example, were frequently learnt by heart, and misquoted in such a way as to show that its main points were not grasped at all. *Junior* candidates appear to have been taught mediæval English history less carefully and less intelligently than later periods. In the case of *seniors* the prevailing faults this year appeared to be: (1) Disproportionate writing and consequent irrelevancy; some questions, or parts of questions, being treated at inordinate length, while others, equally important, were dismissed in two or three lines; (2) Vague answers for which no credit can be given, though the statements in themselves may be true enough, e.g., "The Model Parliament was so called because it was held up as a model of what a parliament should be." The general results point to the unfortunate conclusion that much of the history teaching in schools is still of a haphazard kind; that textbooks are often not supplemented by adequate oral teaching; and that the textbooks used are by no means always the best available.

Judging by the GEOGRAPHY answers of *preliminary* candidates, it would seem that many make too exclusive a use of the small textbooks in which geography is treated merely as a series of statistics; only in a few papers was there evidence of thought. The inveterate confusion between east and west still continues. When asked to give the chief mountain ranges in Europe, many gave lists of British and German hills of secondary importance, and omitted the greater chains. *Senior* candidates are still deficient in their knowledge of the positions of the countries they study, as measured by their latitude and longitude. The application of the general principles of physical geography to particular countries and situations was often weak.

LANGUAGES.—In the pass papers of *junior* candidates in LATIN, the Examiners call attention to the ignorance of the simplest idioms, e.g., that *et*, *suus*, refer to the subject of the principal clause; and that translation of sentences into Latin showed that many were unfamiliar with the most ordinary constructions. The *senior* grammar papers exhibited especial weakness in the irregular verbs and sentences.

In GREEK unseen translation too many candidates made no attempt to place clauses or words in any sort of relation, but wrote straight on, and wrote nonsense.

Carelessness was observable in the FRENCH papers of *preliminary* candidates in the use of accents and of the cedilla in *recevoir*. There was great weakness, too, in the plurals of nouns and feminines of adjectives, particularly in the latter. Many *juniors* displayed a complete ignorance not of French grammar only, but of all grammar. One peculiar feature of the *senior* French answers was the frequent inaccuracy in the translation of the numerals.

Commenting on the *junior* GERMAN papers, the Examiners say that more care should be given to the use of prepositions, and to the order of words in German.

MATHEMATICS.—The division of a sum of money by a mixed number proved too difficult for many *junior* candidates in ARITHMETIC. The frequent neglect of the mention of units calls for comment and was the cause of many imperfect answers. The question on "practice" was correctly done by most of the candidates. Many failed in the question involving a knowledge of discount, and a surprisingly large number showed that they did not know the meaning of the word "assets." An extraordinarily large proportion of the *senior* candidates failed to work out satisfactorily a simple problem involving simple subtraction and division in weights and measures. Very many candidates showed ignorance of the meaning of present worth, and of the relations between the area of the side and the contents of the cube. Both preliminary and junior candidates are accused of knowing little about recurring decimals, but there seems no good reason why they should be bothered with them.

In ALGEBRA, a very uncertain knowledge of the rules governing the change of signs was displayed by many *preliminary* candidates. Many *junior* candidates could not define or find correctly the G.C.M. of two algebraical expressions. The importance of using methods of factorisation in order to simplify algebraical work was not fully realised. The weak points of the *seniors* were indices, surds, and quadratic equations, in regard to which matters much of the knowledge shown was but superficial.

The chief faults displayed in the EUCLID papers of *junior* candidates were: (1) the use of later propositions in proving the one under consideration; (2) much confusion as to the twelfth axiom; (3) an insufficient grasp of the real meaning of propositions—specially noticeable in a common misapplication of I. 4; (4) lack of method in writing out the work. A fresh line allotted to each step should be insisted upon, and all unnecessary words omitted. Proposition I. 6 is as great a stumbling-block as ever, and the majority of the *senior* candidates who inscribe a circle in a triangle omit to prove that the circle they have found does touch the sides of the triangle. Senior candidates would do well to bear in mind that the drawing of additional lines in a figure, before they are sure that they are wanted, does not facilitate the solution of problems. Very few succeeded in writing out Euclid's definition of four quantities in proportion without some omission, apparently

trifling, which shows that they have quite failed to grasp the meaning of it. It would be as well if all who were taught the sixth book of Euclid were shown how the algebraical definition of proportion follows from that given by Euclid.

The general expression for all angles having the same tangent was a cause of difficulty, and proved a stumbling-block to most of the *junior* candidates who attempted the TRIGONOMETRY paper. The same may be said of the equation, in solving which the double sign which arises in extracting a square root was generally omitted. The definition of a logarithm as given in many cases showed a want of appreciation of the difference in meaning of the terms *power* and *index*.

SCIENCE.—Nearly all the failures of *preliminary* candidates in BOTANY are to be attributed either to carelessness or to lack of due acquaintance with the actual *objects*, which ought to form the basis of all elementary teaching in this subject. In the HEAT papers there was too great a tendency to quote definitions learned by heart which, as the context showed, were not understood. The children should be encouraged to write definitions *in their own words*; and they seem to require more practice in *clearly* describing simple experiments.

A large number of the *junior* answers in the BIOLOGY section showed that, whereas the experiment itself was described accurately enough, *even* the particular conclusions to be drawn from it were either quite unknown or, more often, misunderstood. It would be well that, after a demonstration of an experiment, the class should be sent away to work questions, carefully chosen to bring out the conclusions, rather than that these results should be given out, to be learnt by heart.

In the paper on THEORETICAL CHEMISTRY hardly a *junior* candidate could give an answer to the question, as to why, having regard to the composition of water, the atomic weight of oxygen is taken to be 16, and not 8. Most of those who ventured on any comparisons of atomic and molecular weights fell into hopeless contradictions. Also a very few of the candidates seemed to realise that a chemical equation implies the existence of a law of definite proportion. Doubtless the abstract side of chemistry is harder to grasp than the concrete, but the answers to these questions seemed to indicate that the study of the former was greatly neglected.

The general features of the work of the *senior* candidates call for the criticism that in PHYSIOGRAPHY the knowledge of facts is frequently inadequate, and the methods of study are unsatisfactory; there is too much study of books, too little use of graphic methods, and too little reference to personal (*i.e.*, local) experience. Many candidates elaborated a quite incorrect convectional theory of the cyclone, and then remarked that "cyclones are rare in the British Isles." Some explained all the facts of denudation by explaining the plasticity of ice; others wrote freely of "opposition," "quadrature," "priming and lagging," &c., but failed to show any acquaintance with the ordinary facts of high and low water.

Few *senior* answers in MECHANICS made clear the difference between force and pressure; and the HEAT answers showed that the subject of Radiation was not generally understood, and that the laws of pressures of vapours should be taught more systematically.

SCHOOL FURNITURE AND EQUIPMENT.

WITH SPECIAL REFERENCE TO BOYS' SCHOOLS.

By J. W. JARVIS.

Headmaster St. Mark's Training College Schools, Chelsea, S.W.

I.—Desks. The Master's Desk and Discipline.

DESKS are the characteristic feature of a modern schoolroom. In old pictures few children are seen seated at the primitive desk; the greater number are standing round the master, who occupies a prominent position on a platform sufficiently raised to give him the dignity the office demands. The present schoolroom is rather crowded with desks; they appear very closely packed together, and the old open space in the middle of the room has entirely disappeared (Fig. 1).¹

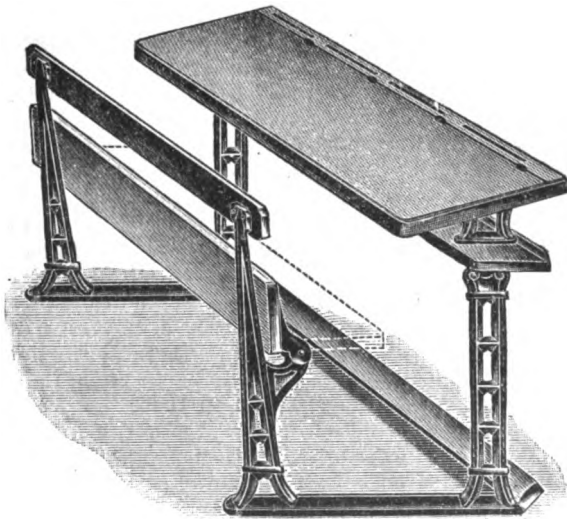


Fig. 1.

There are two distinct styles in desks: long desks varying in size from six feet to twelve feet, and short or dual desks, so called because they are intended to accommodate two pupils only. The latter are invariably made three feet four inches long, and give an allowance of twenty inches a scholar at each desk. In a long desk the allowance

per child is generally reckoned at eighteen inches, and so the exact length will be a multiple of this, e.g., for four children, six feet; for six, nine feet, and so on. This long style of desk spreads a class laterally and suits rooms of a rectangular rather than of a square shape. For some years a silent battle has been going on between these two patterns, and now nearly all modern and reorganised schools are fitted with the shorter form. But, as in many other battles, the dual desk has not won absolutely on its own merits as an educational machine, but on one fatal defect of its opponent. Doctors now tell us that children should have back rests, and that there is an element, if not of cruelty, at least of thoughtlessness in caring for the human frame, if we allow our pupils constantly to lean forward at their work. Now back rests are extremely difficult things to manage with long desks, not in their mechanical attachments, for the blacksmith or ironfounder easily provides for that, but for the difficulty of arranging for any boys to leave their seats when all are at work. Either the boy must crawl under the desk or climb over the back, and neither of these movements can be tolerated by an order-loving teacher. So, by cutting out the middle and joining the two end seats, the modern dual desk has been evolved out of the old long bench. Either boy stands when called upon, and, by taking one step to the right or left, he finds himself in a gangway at least eighteen inches wide leading directly to the front of the class.

If the utmost utilisation of space must be considered, dual desks provide more accommodation than the long desks in the same length of schoolroom, because the latter are arranged only three or four deep, whilst dual desks may be five or six deep. The back of the seat of the front desk nearly touches the edge of the second desk, as no passage way is required behind. The last desk, however, should not touch the wall, because children frequently rest themselves by stretching back, and this behaviour is prevented unless room is allowed. Ready access to each pupil is provided by gangways, and seats can easily be left in order that boys may come to the front to use the blackboard or to perform experiments.

There are certain considerations, however, which occur to the thoughtful teacher when using the dual desks (Fig. 2). The two boys sitting together are brought into close proximity, and the two boys behind can easily glance at the work of the boys in front. The act of copying by raising the eyes is much more difficult to detect and bring home than copying by moving the head sideways. And there is no doubt that class work as opposed to individual work goes on fairly freely unless the teacher is extremely vigilant. The two neighbours help each other openly, they borrow each other's materials and use each other's books, and this is bound not only to weaken independent effort but to prevent each boy using his own energy in solving the problems presented to him. Nothing is more pernicious in school life than mental co-operation, and the help that one boy derives from the other is so worthless

¹ The illustrations throughout this article are taken, with permission, from the catalogue of the Educational Supply Association, Ltd., Holborn Viaduct, London.

that teachers are warned against this co-operative doctrine which so often crops up in our educational history. The teacher is the proper professional helpmeet for the boy and the competition in the class is the right stimulus.

were one asked what educational heresy now prevails in English schools, the reply must be that the pupil is over-talked at and over-taught; his difficulties are smoothed over and the privilege of sitting down quietly and resolutely attempting to solve his perplexities is denied him. The sense of responsibility and the value of individual and unaided effort ought to be fostered in the fifth and sixth forms in our schools.

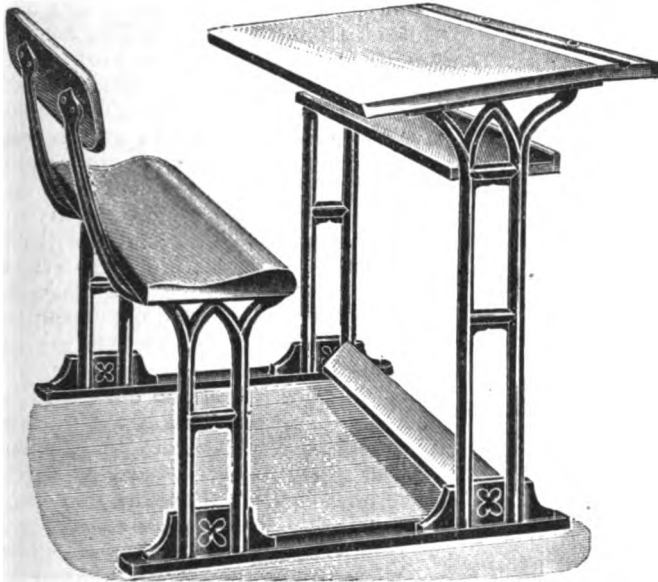


Fig. 2.

In long desks the children can be closed in for oral lessons, and as there are fewer passage-ways the class is compact and easily addressed. In some schools the boys are massed in threes in dual desks for purely oral work; but this is inconvenient, causes overcrowding, and cannot be recommended. Dual desks should not be arranged more than five deep, because in proportion as the depth is increased the teacher must raise his voice to a higher pitch, and this becomes exhausting to himself and at the same time adds inconveniently to the general noise. So far as expense is concerned, a dual desk made of pitchpine, with bookshelf, back, and foot-rail, may be estimated to cost a guinea; while a long desk costs from 4s. 6d. to 5s. a foot, and, as each child requires eighteen inches, the cost for two pupils is from 13s. 6d. to 15s.

For the upper forms of a school single desks (Fig. 3) are most strongly recommended, and these, with locker, back-rest, and foot rail, cost 21s. each. This may seem expensive, but there are many advantages, which cannot be estimated in money, accruing from their use. As the boy grows older he should become self-reliant, and his individuality (though a member of the class) should be developed. The single desk lends itself to private study and to individual work. The boy cannot readily refer to his neighbour, and as these higher classes are not easy to control, much of the noise ceases from want of nearness and temptation. And on the pupil's side there is a gain. Single desks do not lend themselves to oral teaching, and so these bigger boys are not subjected to the set lessons which are becoming too common in all schools. Indeed,

All desks should be arranged in tiers. Three rows may be on the ground floor; the fourth should be raised by blocks of wood about two inches in height placed under and screwed to the standards; and the fifth row should be on a step or gallery not more than six inches above the level of the floor. These low heights are just sufficient for the back rows, and yet not high enough for the boys to easily overlook the work in the desks in front of them.

The dimensions of the desks require special attention, and the demands of the physician as well as the schoolmaster must be borne in mind. The doctor requires:—

(a) A support to the back adapted to the height of the pupil.

(b) The height of the seat so adjusted that when the elbows of the pupil are raised for writing the top of the desk is on a level with them.

(c) The writing surface of the desk to slope at about 15°. And

(d) The seat to be slightly hollowed, and to

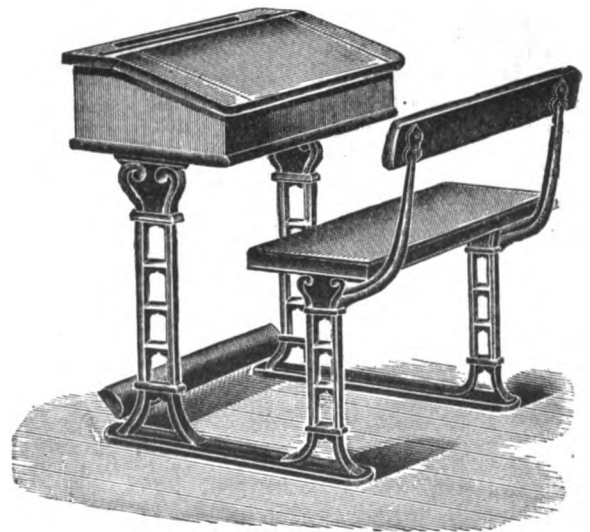


Fig. 3.

have a tendency to throw the pupil backward and upright rather than forward.

The schoolmaster asks for a desk which will

allow the pupil to enter and to leave without noise or disturbance, and so arranged that books and papers can be kept at hand, and that all the pupils are easily accessible to him. School Furnishing Companies make such a number of kinds of desks, each professing to remedy a defect, that it is extremely difficult for the bewildered master to make

leg in a horizontal position. The seat should turn up so that the pupils can enter and leave without discomfort or bending the knees, and it should be from eight to ten inches wide.

The top of the desk is generally made too narrow; some are quoted at 14 inches and others at 17 inches in a catalogue which lies before me.

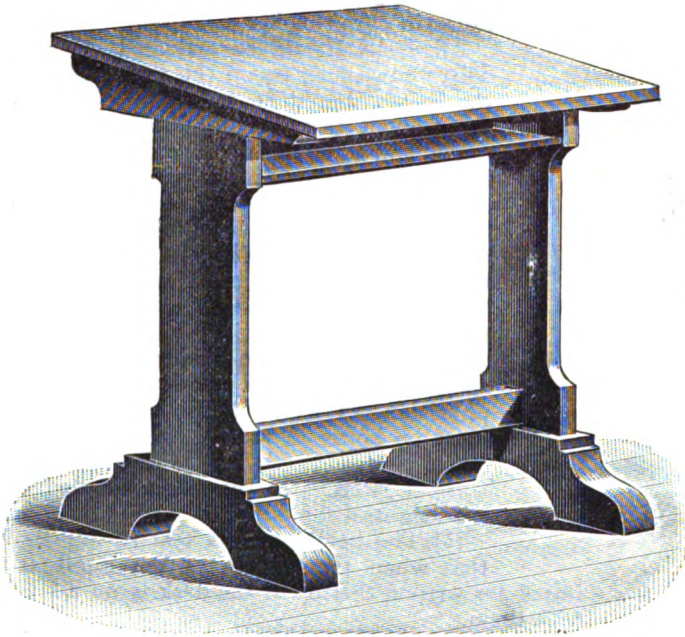


Fig. 4.

a choice among the rival claimants. Perhaps a few "don'ts" may help us to come to a conclusion.

(1) Don't purchase a desk with many patent movements. They get out of order, and the cost of sending them away for repair is too great.

(2) Don't have movable tops, nor half the top convertible into a reading slope. Fingers are often pinched in the hinges, the crack grows wider with use and the writing surface is interfered with. It is much better from a hygienic point of view to move the hand holding the book rather than adjust the body to a rigidly fixed book.

(3) Don't have a raised ledge in front or at the top of the desk; the former interferes with the arm in writing, and the latter prevents the pupil pushing his paper or book upwards as he writes down the page.

(4) Don't purchase a desk without back-rest, hollowed seat, foot-rail, and a book-shelf. As slates are not used in school, don't provide a slot for the slates.

(5) Don't waste money on elaborate ink-well arrangements.

The edge of the desk should be vertically over the front of the seat, and the latter should be high enough to allow the pupil, when seated, to place his foot on the foot-rest with the upper part of his

leg in a horizontal position. The seat should turn up so that the pupils can enter and leave without discomfort or bending the knees, and it should be from eight to ten inches wide. The top of the desk is generally made too narrow; some are quoted at 14 inches and others at 17 inches in a catalogue which lies before me. At least from 18 to 20 inches are required, and as the pupils grow older they need more space. The art-desk top is nearer the ideal (Fig 4). Nowadays boys use more books and papers than formerly, and exercises are worked upon a larger scale. The height of the desk above the seat should be such that the fore-arm can rest upon it without displacing the shoulder, and there should be a groove near the top edge of the desk for pens and pencils. Do not screw the desks to the floor; they should be moved for cleaning purposes.

Now a word about the desk drill in schools. As a rule there is a tendency to make this too elaborate, and to impose too many restrictions on the pupil. Little boys should be required to enter and leave their seats in an orderly and systematic manner, but as they grow up these rules should be relaxed in favour of a general orderly bearing in the schoolroom. If schoolmasters will insist on good manners rather than on good discipline, then the boys will take their seats naturally and the general standard of behaviour will be higher.

Opportunities for friction will be removed, and there will be an air of ease, comfort, and freedom about the schoolroom which is not cultivated by the discipline of the barracks.

The master's desk should be raised on a fairly large platform about six inches in height, so that

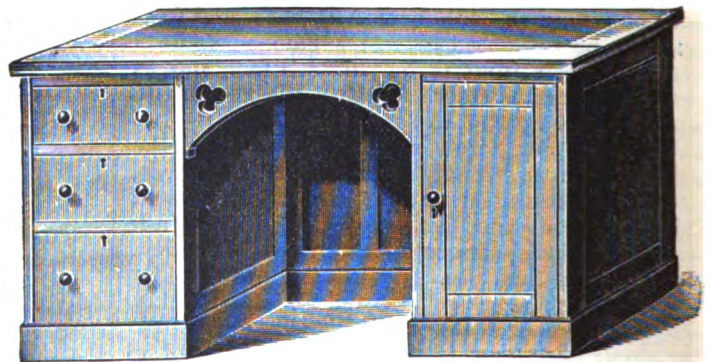


Fig. 5.

from it a clear view of the class can be obtained. The ordinary-shaped pedestal table with flat top and drawers is recommended (Fig. 5). On no account should the top lift up. The cupboard below is rarely tidy—indeed, it is almost impossible to keep it so; papers are forgotten by

being covered up; the top has always to be cleared before it can be opened, and the lock invariably gets out of order. Drawers are more easily kept tidy; and if the top one is partitioned for note-paper, envelopes, pens, and black and coloured leads, and another is reserved for foolscap and drawing paper, the most unmethodical man is gently led into the paths of order and tidiness. One side of the pedestal should be arranged cupboardwise for reference books more exclusively the property of the form master. An inkstand for at least two coloured inks and a pen-tray are necessary equipments; and a duster which should not be used for the blackboard will add very materially to the comfort of a clean man.

A plain, strongly-made table, or a ledge at least a foot wide, against the wall of a room ought to be provided for exercise books and other materials used throughout the day, and these should be cleared away at the close of the afternoon school. In every class-room a notice board should be placed sufficiently low down that the boys can read the notices without craning their necks. Length without much breadth is a capital rule to be observed in making a notice board, and tapes in one part and drawing-pins in another are required.

(To be continued.)

EDUCATIONAL IDEALS IN AMERICA.¹

THE volumes edited so industriously by Mr. M. E. Sadler for the Board of Education have contained from time to time matter of exceeding interest and value, interspersed with some of merely ephemeral importance. But of the two volumes now before us it is hard to speak too highly. Though there is necessarily a good deal of repetition in them, they are nothing less than a veritable armoury of sociological facts and practical philosophy of direct moment to us Englishmen; and the pages which need be read only once are few. It is curious to reflect how little the course of English public education, as interpreted officially, has, so far, been influenced by the rich material thus distributed. In the main, perhaps, this is because the Board to which Mr. Sadler's department is attached is a bureau constituted principally to dole out parliamentary money in such a way as to avoid parliamentary difficulties. It is only faintly concerned with sociological questions, and only faintly, therefore, interested in education as such. How can it be otherwise? The use of strong language of animosity to the address of education has not been confined to Chancellors of the Exchequer classed

as wicked Tories. To English statesmen generally education has been a nuisance (*adjective à choix*), and not a beneficent force ready to the hands of the powerful and willing in politics. And as for English teachers, to hosts of them education is persistently presented, under a pretence of solicitude for children, as a miserable congeries of personal and sectional controversies. To English clergymen, again, of every sect, it has too often been an instrument for mean and angry bickering, half social, half theological. For all this America is too big. That is why it is high time for us to go to school to America. And here the American schoolmaster is at our doors.

It is pleasant, out of the mud and fog of our own quarrels, to get into an atmosphere in which the best way of bringing up children and of preparing adolescents at every stage for the next is seriously and bravely faced as a question of supreme national moment. Open these pages where you will, you will find that the highest practical sagacity of America (*financeering* is not the highest *πραξις*) is intent on this work. It is impossible in America to imagine this most vital of all national interests placed in the hands of a gentleman of large property merely because something must be found for him. It is perfectly true indeed, (though little is said of it by the witnesses here called into court), that in some American places the smaller educational offices are occasionally bestowed on mere political grounds; but such corruptness is an infantile malady, fast disappearing before the social and spiritual sanitation of American public opinion. It is nothing in comparison with the immense energy and intelligence which are exerting themselves seriously, cheerfully, and confidently in the solution of educational questions.

In the space here available one is unable to do anything like justice to the many admirable monographs which Mr. Sadler presents in these volumes. The right line of introduction is taken by Sir Joshua Fitch, and put in the second volume with especial point by Mr. Sanford, to the effect that no thoughts on education, no educational practices, are so important to us as are the American. We have been so loudly and persistently told to go to Germany for our lessons and our models that some worthy "educationists" would have us do nothing less (or more) than "Germanise" our education. But our needs and our national destinies cannot be measured by any "wee wee German lairdie;" it is amongst our own kinsfolk, free like ourselves, but subject to less traditional and social constraint, that we shall most profitably see to what forms our free institutions tend—not amongst far-away connexions politically and spiritually police-ridden, and so notoriously and even blatantly out of sympathy with us as are the Germans.

For a combination of close observation and philosophy, Mr. H. T. Mark's contributions are notable. With less crudity of style than previous work of his reviewed in these columns, he puts and discusses the sociological problem exactly.

¹ Special Reports on Educational Subjects (Board of Education). Eyre and Spottiswoode. Vol. x., pp. 525, 2s. 3d.; vol. xi., pp. 612, 2s. 6d.

Mr. H. G. Wells and Sir John Gorst and their like may sneer at the Formation of Character being made the aim of education; but there is no doubt about the American view. It is commonly supposed that the American aim is rigidly "commercial," whereas, as Mr. Sanford says, the talk of "commercial supremacy" in connexion with education is far more frequent in England and Germany than in America. In Germany, the classic land of pedagogy, sacred to Froebel and Herbart and Rein, national necessities as well as a wooden tradition work hard against civilisation. But we English are under no such stress. This is a democratic community; the important thing to us is not the maintenance of garrisoned frontiers, nor the respected dynasty, nor any particular part of our constitutional framework. And in this we are subject to the same conditions as the United States. The aim of the American school and college is not, as set forth here, chiefly intellectual; it is chiefly moral. School and college are the nurseries of freedom, places where men and women are to learn to rule themselves in order that they may make the best of every power they have for the good of their community. This affects all sorts of questions pressing on us, here in England, for solution: co-education, the employment of women, school discipline, curriculum, *lehr-freiheit*, centralisation, common schools.

Of course one writer after another admits the demerits of many of the varieties of organisation in which this spirit finds expression. The school, for instance, in which the scholars make their own laws, like those in which they make their own reading-books and are set serious "research problems," by "heuristic" method, will seem to most people a flagrant waste of traditional stores of wisdom and discovery and achievement. "Strong personalities," as Principal George Carman calls them, may be too dearly purchased. The democracy mentioned by Plato, in which the donkeys were too democratic to get off the foot-way, was hardly a progressive community, even for donkeys.

Many English readers will be particularly impressed by the accounts given by Mr. Sanford and others of the curriculum in American secondary schools. They will learn that intensive specialisation is less common under the American system than under ours. It was only yesterday that an egregious person advised England to break up its education into such fragments as would correspond with the units of educable individuals; the common ground that is the basis of common knowledge, and of character, and is the root of human sympathy, was too wide for him to see. There have been too many sad experiments on these lines in very sensitive areas of our public education. By all means conserve individuality, but let elective studies be complementary. *I met a hundred men on the road to Delhi, and they were all my brothers.*

The wisest man is he who takes the longest views and fits most sagaciously the intervening steps between aim and effect. It is not surprising,

then, that the solicitude of American education concentrates itself on the provision of efficient teachers. America knows better than to trust to the hedge-rows and highways. In 1899, as Miss Findlay's figures show, in American normal schools of one type and another there were 90,000 students. It is to be remembered, of course, that the normal schools are by no means all used exclusively by persons who are intending to become teachers; yet that very fact shows that in American opinion the highest general education possible is properly housed where the main work is the preparation of schoolmasters and schoolmistresses. A departmental committee of our English Board of Education once proposed that the Pupil Teacher Schools should be gradually turned into secondary schools, open to pupils destined to any profession. We have replied by telling them to put up their shutters; but the committee was right, *et prae-valebit*.

To be sure, amongst the multitude of counsellors collected round Mr. Sadler there are many differences of opinion. For instance, one authority warmly recognises the advantage of our English habit of having form-masters charged with the bulk of form work—a view with which the reviewer sympathises; another would apparently have none but specialists in the secondary schools, each teacher being acquainted, as some one has said, with only a part of each pupil. Similarly, while the great bulk of opinion regards "method" as applicable alike to every part of the teacher's work, a writer here and there has such a touching belief in machinery as to desiderate for every "subject" a special "method."

Mr. G. L. Fox calls particular attention to the differences between English and American secondary schools as they strike a working teacher and administrator; his contribution will therefore be read with special interest by his English brethren. Of course he falls into a few errors of fact—as, for instance, when he affirms that with us success in Latin and Greek verse-composition is indispensable if a boy is to win a "classical" scholarship; but he is generally as accurate as he is acute and suggestive. We wish English public opinion would, with him, condemn the public cock-crowing of headmasters on prize days; but let us meantime thank our stars that the distributors of prizes do not kiss the happy recipients nor bestow upon them green-paper garlands.

To conclude: a reviewer is in despair when he is called upon to summarise his impressions of so monumental a set of papers as are here collected; for a reasonable disquisition he would require as much space as is covered by the originals. It must be enough to say now that Mr. Sadler's own contributions are worthy of the best he has done in his series, and that every teacher and every person sincerely concerned in English education should read the two volumes. Taken together, they constitute a full and authoritative account of the present most significant organisations and aims of a noble and puissant nation, a branch of our own solid stock.

EDUCATION AT THE BRITISH ASSOCIATION.

WHEN Dr. Armstrong suggested that a section of Educational Science should be added to those already forming part of the British Association, it was scarcely expected that the section would assume at once the important and influential position it now occupies. The general impression was that the section would serve a useful purpose as a place to which papers upon educational matters might be sent if other sections did not want them, but this undesirable tendency was immediately checked by the decision of the Committee not to accept a variety of papers upon small details of educational science and practice, but to make each meeting a debate of some specific subject upon which expressions of authoritative opinion would be of value. This was the course adopted at the opening of the section last year, and it has been followed at Belfast with decided success. Subjects of prime importance have been introduced by persons of distinguished eminence in science and education, and they have then been discussed with astonishing freedom and fervour. Every meeting of the section has been largely attended, and the interest shown in the subjects has been so keen that other sections are regarding the rapid growth of the new member of the Association's family with mixed feelings. Certainly, no section of the Association has had more successful meetings than that of Educational Science, and none have received more attention from the general public.

It may not be realised at first how valuable the work of the section can be to the educational world. Though the number of members of the teaching profession present at the meetings this year was greater than that of last year, yet no one would suggest that the meetings were representative gatherings of masters and mistresses in schools. But it would be a pity if on this account teachers regarded the work of the section as having little concern with them. The Association is a powerful organisation, and it exists to promote the advancement of all subjects with which it is concerned. Moreover, men who are inspired with the spirit of science are ever ready to lend their assistance to movements of reform and progress, without consideration for the interests of traditional schools and methods. The Headmasters' Conference and the Headmasters' Association have been with us for many years, but they have done very little to increase efficiency of teaching, and have shown little sympathy with those who are working with that aim. An influential and independent body devoted to the progress of educational science was, therefore, needed.

In its two years of existence, the Education section of the British Association has directed public attention to many serious deficiencies in our systems and methods of instruction, and its great influence is already being felt in the educational world. Take, for instance, the movement started

by Prof. Perry for reform in methods of teaching elementary mathematics. The Report of the Committee upon this subject is printed in another part of this number; and it will be seen to consist of suggestions with which most teachers will find themselves in agreement. We have in this Report an expression of opinion of men of the first rank that the traditional methods of teaching elementary mathematics in this country should be superseded by others of greater educational value. Since the Committee was appointed other associations have taken up the matter, and the result is that we are now within sight of developments which have been desired by progressive teachers for many years. Public authorities concerned with examinations have been led to revise their requirements in the light of the views expressed by leading mathematicians, and examiners have shown their sympathy with them by modifying the character of their questions. It is by this kind of influence that the British Association will affect the work of schools, and it is on this account that teachers should welcome the efforts that are being made to relieve them of some of the dismal tasks of the schoolroom. They may depend upon it that whatever subjects are taken up in the same way will be considered with the idea of improving conditions of teaching and making the work of schools less discouraging than it is for both teacher and pupil.

The Committee which has been appointed to consider the teaching of botany in schools will doubtless suggest directions of work of a far more inspiring kind than that which has usually been attempted in the subject. The study of botany should not depend upon dried specimens with Latin names, but upon simple observations of living plants from the seed to the mature organism with its provision for carrying on its species. There are few teachers of the subject but would welcome this change if they were free to choose their methods, and it only needs the influence of the British Association to induce examining bodies to modify their requirements from young pupils studying botany. The Committee consists of Prof. L. C. Miall (chairman), Mr. Harold Wager (secretary), Miss L. J. Clarke, Mr. A. C. Seward, Dr. Blackman, Prof. J. Reynolds Green, Prof. J. B. Farmer, Dr. C. W. Kimmins, Prof. Marshall Ward, and Prof. T. Johnson.

From this list it will be understood that whatever recommendations are made by the Committee will represent the expression of competent opinion, and will provide reasons for action by authorities and individuals desiring reform in methods of studying plant life.

The presidential address delivered by Prof. Armstrong before the Education section, and that given by Prof. Perry before the section of Mechanical Science, will perform similar valuable services for the educational world. Important questions are raised, and they will influence public opinion and administrative bodies in a way which men with limited ideas and experience have a difficulty in estimating. What we want more than anything else is to impress the public with a sense

of responsibility for the means of educational progress. Once let it be understood that members of the teaching profession are concerned with matters of national importance, and we are on the way to increased efficiency and more liberal recompense.

All the subjects brought forward in the section have been discussed in the most lively and helpful manner. The meetings devoted to Irish educational work consisted of a series of vigorous pronouncements upon administration and programme. Dr. Starkie, Resident Commissioner of National Education in Ireland—a position equivalent to that held recently by Sir John Gorst in England—has given Irish educational management and methods such a shaking that it will never be able to settle down comfortably until a new basis has been found. Mr. T. P. Gill, Secretary of the Department of Agriculture and Technical Instruction, dealt with the Department's science programme in Irish secondary schools, and described its promising qualities as a factor in educational development. Though by training and sympathies a humanist, he gave his blessing to the science scheme, and in the course of his paper remarked, "Scientific physics, which have now their recognised place in scientific instruction, are admittedly no more difficult to learn or to teach than Latin or Greek, and in our Irish public schools at the present time, I venture to say, Latin and Greek are not so well taught as our experimental science, with all the great drawbacks and the difficulties which have beset us in the endeavour to provide teaching power." Mr. W. M. Heller, who has organised the practical science work in Irish National Schools and is responsible for the admirable course adopted, described the intention and co-ordination of the various subjects of instruction comprised in the scheme. Mr. R. M. Jones, Principal of the Royal Academical Institution, Belfast, gave the views of a practical schoolmaster upon the working of the intermediate education system under the old rules and the new. All these subjects were discussed with astonishing vitality and sound sense, and there can be no question that both the responsible organisers and the working teachers present at the meetings profited by the exchange of views in a free atmosphere.

Schemes of educational work in science were discussed in connection with a paper by Dr. C. W. Kimmins on the subjects to be taught as science and the order in which they should be taken. After the kindergarten it is suggested that children from 8 to 10 years of age should take up the study of natural history—by which is meant simple observations of natural objects and phenomena; botany, from 10 to 12 years of age; elementary experimental science, 12-14; and advanced experimental science, 14-16, with possible modifications for girls above 12 years. The general feeling of subsequent speakers seemed to be that, though this order could be considered as educationally sound, yet no definite rule as to order or ages of study of the various subjects should be followed by all pupils.

A discussion on the training of teachers was

opened by Miss L. E. Walter with a paper having special reference to women, and one by Prof. H. L. Withers. Miss Walter brought together in her paper a large amount of information upon the existing examinations and preliminary training required of qualified teachers, and asked for consideration of practical improvements in the courses of study pursued between the ages of, say, 16 and 18 years. She urged that for girls who intend to become teachers provision should be made for them to receive a good secondary education with girls who have other intentions. Ability and inclination should determine whether they are to be teachers in elementary or secondary schools, and in the case of the former there should be a period of teaching under supervision, the student should study for one year and train for another—the year of training to be entirely devoted to professional work. In the course of an excellent address, Prof. Withers pointed out that the problem of training of teachers in the cases of primary and secondary schools must be treated separately. It was held that, if the analogy of other professions is any guide, a combination between the secondary schools and the universities is essential for the institution of a complete system of professional training. The ideal training would seem to be that obtained at a good school in which the headmaster has a knowledge of the principles of education and a desire to encourage his assistants to become qualified teachers. By this means the best combination of theory with practice is obtained.

Similar views were expressed in the discussion on the training of engineers opened by Prof. Perry. In this case, however, it is not desirable that a boy should enter the workshops at an early age, as he does in an analogous way when he becomes a pupil teacher in a primary school. The engineers agreed that the best foundation for their profession was a liberal education, and that not until this had been obtained should the professional practice be commenced. Work at a technical college with modern machines and tools, and under men who understood the needs of the times, could, however, be made of the greatest value to the student intending to become an engineer.

The last day of the section was devoted to the discussion of the teaching of English and the Report of the Committee on the Teaching of Mathematics. Mr. P. J. Hartog gave an interesting account of the work done in French schools, and pleaded for the rational and systematic teaching of the mother tongue in English schools. By neglecting this teaching he held that the teacher was deprived of the most powerful instrument in education. Mr. Hartog insisted forcibly and eloquently on the necessity for reform, and described the specific proposals put forward by him in the June number of the *Fortnightly Review*. The points suggested for debate were:—

- (1) Provision should be made for the training of teachers in English literature and composition.
- (2) Not less than three school hours weekly should be devoted to the study of the mother tongue in all classes of secondary schools up to the age of 17.

(3) In all entrance examinations for the professions candidates should be required (a) to put into shape, either in the form of a letter or otherwise, a fairly complicated series of facts relating to a subject within the curriculum or their everyday knowledge; (b) to write an independent composition on a subject within the curriculum or their everyday knowledge. Not less than three or four hours should be given to these tests, and all candidates should be required to pass them satisfactorily.

In the course of a paper on the neglect of English grammar, Prof. G. M. Minchin mentioned some of the common errors which are encountered every day. Among misused words and expressions are *not only*, *either* in its wrong place, or used instead of *both*, *scarcely* . . . *than*, *without* instead of *unless*, split infinitives, misplaced *shall* and *will*, *like* instead of *as*, and many others. As the chief purpose of the study of grammar is correctness of speaking and writing, it is important that barbarisms of the kind mentioned by Prof. Minchin should be avoided.

So much has been published already in these columns upon the suggested reforms in the methods of studying elementary mathematics that it is scarcely necessary to go over the ground again. The important point of the discussion this year was that several tutors and masters engaged in teaching mathematics were present and contributed some valuable views of the subject. Among the speakers were Mr. A. W. Siddons (Harrow), Prof. H. H. Turner, Mr. Coates, Prof. A. Lodge, Dr. Macaulay (St. Paul's), Mr. C. Godfrey (Winchester), Mr. W. D. Eggar (Eton), Prof. A. R. Forsyth, Prof. J. Perry, Prof. J. Purser and Prof. H. E. Armstrong.

There was some difference of opinion as to the necessity for adopting a definite standard of uniformity and establishing a central board to which schemes and text-books could be referred, but everyone agreed that practical work with simple mathematical instruments was an essential introduction to the study of formal geometry.

The controlling influences of examinations was mentioned, and it was agreed that little could be done until examining bodies modified their requirements. Judging by the signs of the times, we shall not have to wait long before mathematical teachers will be free to adopt reformed methods of teaching if they are so inclined.

To all who have attended the meetings of which an inadequate summary has here been given, it is evident that the Education Section of the British Association will become a powerful factor of educational progress. The new body provides a platform upon which all questions affecting the work of schools can be discussed from the points of view of teachers and educators of many types, instead of being limited to one particular class. If those who are engaged in educational work do not avail themselves of the opportunity thus afforded of directing public attention to their needs, methods and difficulties, they show themselves indifferent to matters affecting the position and progress of their profession.

Several bodies of teachers were represented at

the meeting which has just concluded, but it is impossible to overlook the fact that not a single headmaster of a great public school was present. Mr. C. M. Stuart, Headmaster of St. Dunstan's College, Catford Bridge, and a few other principals of his progressive type, gave the meeting the benefit of their presence and opinions. Girls' Public Day Schools were represented by Mr. W. Bousfield, and many assistant-masters and assistant-mistresses were present in addition to the delegates of their Associations. Doubtless many of these had a difficulty in finding time to attend, but they had sufficient interest in their work to give up a few days of their holidays to the discussion of subjects connected with it. Leading men of science carry out the same self-denying ordinance, though their holidays are often short and their time always fully occupied. The reason is that they are interested in the development of knowledge, and are anxious to know the views of others upon directions and results of study. It is unfortunate that leading headmasters have not given evidence of the same receptive attitude, so far as the British Association is concerned. The Council of the Association nominated the Rev. G. C. Bell as a vice-president last year, and Canon Lyttelton as a vice-president this year, but neither has been able to attend, though their presence might have helped to remove the impression among men of science and others that interest in education is not fostered in public schools any more than interest in military science is encouraged in the Army. The general absence of headmasters of great schools justifies the remark that assistants can scarcely be expected to show keen interest in the science of education while they know that their chiefs attach so little importance to it.

THE REFORM OF ENGLISH EDUCATION.¹

THE marvellous development of scientific activity during the past century has been consequent on the establishment of fruitful theories. If teachers generally would pay more attention to theory their teaching would doubtless be more fruitful of results; facts they know in plenty, but they lack training in the considered use of facts. False prophets among us have long taught the narrow doctrine that practice is superior to theory, and we pretend to believe in it. That the belief is founded on misconception may safely be contended, however; the two go together and are inseparable. It is true that we have enjoyed the reputation of being a practical people, and have been accustomed to take no little pride in the circumstance, and to scoff somewhat at theory, but behind our practice in the past there was a large measure of imaginative power, of theoretical insight; in fact, we were successful because we were innately possessed of considerable power of overseeing difficulties, of grasping an issue, of brushing aside unessential details and going straight to the point; in other words, of being practical. We are ceasing to be

¹ Abridged from an Address to the Educational Science Section of the British Association for the Advancement of Science, delivered by Prof. Henry E. Armstrong, LL.D., Ph.D., V.P.R.S., President of the Section, at Belfast, on September 11th, 1902.

practical because modern practice is based on a larger measure of theory, and our schools are paying no proper attention to the development of imaginative power or to giving training in the use of theory as the interpreter of facts; didactic and dogmatic teaching are producing the result which infallibly follows in their wake—sterility of intellect.

Our system of education has no proper theoretical basis. Educators have ceased to be practical because they have failed to keep pace with the march of discovery; the theoretical basis underlying their profession having been enlarged so rapidly and to such an extent that it is beyond their power to grasp its problems. The priesthood of the craft are, in fact, possessed by the spirit of narrow parochialism, and upholders of an all too rigid creed, being lineal descendants of a privileged class—"the knowledge caste," to use Thring's expression—whose functions were far more limited than are those which must now be discharged by teachers if teaching is to be given which will serve as an efficient preparation for life under modern conditions. They enlarge *ad nauseam* on the superiority of literary and especially of classical training, forgetting that their preference for classics is but the survival of a practice, and that their arguments in defence of a literary system are but preconceived opinions. Being incapable of appreciating the arguments used on the other side, it is unlikely that they will ever be able to admit their force.

This section is in advance of the times, being concerned with a non-existent science—the science of education. The science will come into existence only when a rational theory of education is developed and applied; but it is clearly on the very eve of coming into existence, otherwise the Section could not have been established; and we may contribute much to its development.

Surely, the primary article of our creed will be that—as Thring has said—"The whole human being is the teacher's care," for all must admit that the faculties generally should be cultivated and educated. At present we make the fundamental mistake of disregarding this truth, but there is evidence that sounder views are beginning to prevail. It is very noteworthy, for example, that in the recent report of the Committee on Military Education it is laid down that *five* subjects are to be regarded as *necessary* elements of a sound general education, viz., English, Mathematics, a modern language, Latin, and Experimental Science. Moreover, it is recognised that each of these subjects has a peculiar educational value of its own. Such a conclusion takes the breath away; indeed, it is almost beyond belief that headmasters of public schools could commit their brethren by attaching their names to a report containing such a paragraph as the following:—

"The fifth subject, which may be considered as an essential part of a sound general education, is experimental science, that is to say, the science of physics and chemistry treated experimentally. As a means of mental training, and also viewed as useful knowledge, this may be considered a necessary part of the intellectual equipment of every educated man, and especially so of the officer, whose profession in all its branches is daily becoming more and more dependent on science."

Just consider what this recommendation means; that it is now publicly admitted by high authority that *all* boys should have the opportunity given to them at school of gaining knowledge *by experience*—by actually doing things themselves, not merely by reading about them or being told about them, because this, and nothing short of this, is what is aimed at by all who advocate the introduction of experimental science as a necessary part of school training.

Unless we are prepared to disregard not only all the lessons of the recent war, but also the lessons we have been receiving during years past in the wider war of commercial competition;

unless we are prepared to disregard the still wider consideration that education must be an effective preparation for life and not merely for business, the findings of the Committee on Military Education must be embodied in our practice. Undoubtedly the real issue decided by the Committee was the question whether the *antecedent*, and not the technical, training of military candidates was properly conducted. In other words, *our public school system was on its trial*. Although not referred to in so many words, this system is most effectively condemned in spirit in every line of the report, and far more between the lines. But the Committee have merely recognised what has been known for years and years; not a single novel point is brought out—not a single novel issue is raised in their report. By making definite recommendations, however, they have lifted the subject on to a higher plane, and it is these recommendations which require the most careful consideration *and revision*; for if carried out as they stand there will be little improvement in our condition. The Committee have certainly done more than they were asked to do, but not more than they were bound to do. By the terms of reference they were to consider and report what changes, if any, are desirable in the system of training candidates *for the Army* at the public schools. Instead they have recognised that education at secondary schools has in a great measure conformed to the course generally prescribed by public professional examinations originally designed to secure the selection of candidates who had availed themselves of the advantages of a good general education; and that the State has been careful in the matter of examinations that they should be so framed as not to disqualify or hinder the unsuccessful candidate from entrance into other professions; or, in other words, that neither more nor less is to be exacted from candidates for entrance into the army than from candidates for other professions. Consequently the requirements to be laid down for army candidates are such as can be met from a sound general education, and in no way special. The Committee have, in fact, pronounced judgment on the subject of all others which is of greatest consequence to the nation at the moment. But they were not actually appointed for such a purpose, although they should have been, as it was to be foreseen that the major issue must be tried if the minor were to be settled. The modern spirit in education was not sufficiently represented on the Committee. Of the witnesses examined too few had any practical acquaintance with the work of education, although a great many who could judge of its effects gave evidence; and the practical side of education was scarcely considered. Only one witness was examined on behalf of "Science," and Mathematics was unrepresented. Such being the case, it is surprising that the Committee should have gone so far in their recommendations, and a proof how overwhelming the case must be in favour of change.

It is to be noted that the recommendations of the Committee on Military Education clearly involve the recognition of two sides to education—a *literary* and a *practical*. I use the term practical advisedly, because it would be wrong to draw a distinction between a literary and a scientific side, as the whole of education should be scientific, and science—true knowledge—and scientific method—true method—should pervade and dominate the whole of our teaching, whatever the subject-matter; and as the object of introducing experimental science into the school is to give the scholars an opportunity of gaining their knowledge at first hand—by practical heuristic methods, as distinguished from literary didactic methods—the introduction of such discipline may be properly said to involve the recognition of a practical side.

The term "practical" must not be understood as the antithesis of "theoretical." Practice is inseparable from theory in all true teaching, the advance from one practical step to the next being always over a bridge of theory. But if it be granted that edu-

tion necessarily has two sides, it follows that the Committee on Military Education are illogical in their recommendation that Latin and experimental science may be treated as alternative subjects; they are but complementary, not alternative, subjects. The only possible alternative to Latin would be a subject in the literary branch—another language, in fact.

But the recommendations of the Committee are also far from satisfactory on the subject of languages. "The study of languages," they say, "forms a third main feature of a sound general education. Of these the most important, from an educational point of view, is Latin. Modern languages, though much inferior to Latin as a means of mental discipline (at least as generally taught), must none the less be regarded as an important part of a sound general education." In face of this conclusion it would have been logical to make a modern language rather than Latin the alternative to experimental science, but obviously the Committee dared not omit the modern language. It is true the recognition of experimental science and Latin as possible alternatives may be regarded as a high compliment to the latter, but it was never intended to be such; in truth, it marks the recognition of the inevitable: that Latin will ere long be deposed from its high estate, and intellectual freedom granted to our schools, greatly to the advantage of Latin, I believe. There is no doubt that the relative value of Latin as an educational subject is grossly exaggerated; those who dwell on its merits are rarely conversant with other subjects to a sufficient extent to be able to appreciate the effects these would produce if equally well taught. As a matter of fact, in the case of Latin the most capable teachers have been chosen to teach the most capable boys, and the results obtained have been unfairly quoted in proof of the superior value of the subject. We have yet to discover the highest value of other subjects, their depth of power as disciplinary agents having been most imperfectly sounded. And if we consider results, do not they afford proof that the belief in Latin (as taught) is misplaced? It has been the staple subject of education and has been supposed to afford the most valuable training possible in composition. Nevertheless, the complaint is general, and not only here but also in Germany—where Latin is far more taught and believed in—that composition is the one subject of all others which the schools do not teach. The fact is, Latin is a subject which appeals to the minority of scholars, and the time of the majority is wasted in studying it. I would give to all an opportunity of proving their aptitude in Latin and Greek, or at least some opportunity of appreciating the construction of these languages; but I am inclined to favour the proposals—made by high authority, I believe—that such studies should follow that of modern languages rather than precede it. The true study of classical languages should be reserved for the University. In any case, it is beyond question that a very large proportion of those who would make magnificent officers are incapable of learning Latin to advantage; such will in future enjoy the inestimable advantage of studying experimental science; but if those who take up Latin are in consequence to lose all opportunity of acquiring some power of reading the secrets of Nature, and of thereby developing thought-power and mental alertness—and such must be the effect of the adoption of the recommendations of the Committee—they will prove to be of little value to the Army in comparison with their colleagues whose eyes have been trained as well as their "intellect." In the course of the evidence given to the Committee, Dr. Warre expressed the view that Science would kill Latin eventually. Nothing could be more unfortunate, but the course adopted by the Committee is that most calculated to bring about such a result, as Latin is thereby put in competition with a subject which must ere long be regarded as a necessary subject of school instruction under all conditions. Latin should be made one of the optional subjects along with Greek.

It still remains to consider the specific recommendations of the Committee with regard to experimental science, as these are most unsatisfactory. Nothing could be more satisfactory than the manner in which the subject is dealt with by the Committee in their general report, paragraph 20, already quoted. But on turning to the scheme of the proposed examination (Appendix A), it appears that not one experimental science but two experimental sciences are contemplated, viz., Physics and Chemistry, either of which may be taken in preference to Latin and together with English, Mathematics, and French or German. A most important issue is involved in this recommendation, and it cannot be too strongly opposed.

It is very strange, and a proof of how little we are accustomed to act consistently or to organise, that having found a good thing we rarely make use of it. In the early days of scientific teaching the elementary parts of chemistry and physics were taught as one subject; but gradually, as the individual sciences developed, this healthy practice fell into abeyance. Then time brought its revenge; it was seen that a very one-sided creature was being trained up; that the subjects were in reality interdependent. Moreover, a revolt had been setting in against the formal stereotyped manner in which chemistry was being taught in the schools; this came to a head about 1887, and a better policy was inaugurated by the Reports and scheme presented to Section B of this Association in 1889 and 1890, which condemned "test-tubing" in favour of problem work, and led to the introduction of the quantitative exercises which are now generally admitted to be of the first importance. Although the scheme dealt primarily with chemistry, being the work of the Chemical Section, it yet had a physical basis; physical measurement, in fact, was its life blood, and all the earlier exercises prescribed in it were in essence physical exercises; moreover, the importance of paying some attention to bio-chemical and bio-physical phenomena was not overlooked. As teachers have gained experience of the educational value of the heuristic methods advocated in the British Association scheme, they have been led to apply them more and more widely, and the teaching of elementary science has in consequence been regarded with growing favour of late years; more and more has been done to give it the necessary breadth so as to constitute it an effective system of "Nature Study."

The University of London—not the reconstituted body of the present day, but the much-abused examining body of the past—after careful inquiry a few years ago advisedly substituted the subject of General Elementary Science for the specific sciences previously prescribed for the Matriculation Examination, and by so doing took a forward step which has generally been admitted by those who can really appreciate the issue to be one of the most important possible from an educational point of view. But the syllabus was imperfectly drawn up—although it had many good points—and the examination was entrusted to men who, besides having little sympathy with the subject, had scant knowledge of school requirements and possibilities. Consequently, the examination was a failure, as everyone foresaw it would be if conducted without proper consideration. The new University has taken the *most unwise* step of reverting to single subjects. It has done far worse than this, however, in making "science" an alternative subject. Such a reversal of the policy so long pursued by its forerunner can only be described as a *national disaster*. I make this statement with utmost consideration, and trust that the fact that it is so pronounced from the Chair of this Section may give increased force to my opinion.

As to the value of "science" to military men, it is easy to understand that they should have little conception what it may do for them; having never received proper training hitherto, they cannot have had the opportunity of testing its usefulness or

of appreciating its merits. But making all allowances, it is difficult to understand an answer such as that given by Lieutenant-Colonel Murray (Q. 4,806) to the Committee on Military Education, viz., that "Science is a narrowing study for the young mind, and we want to widen and open the mind as much as possible; let them learn their science afterwards" (that is, after the entrance examination). The contention of the advocates of "science" has always been that of all subjects it tends most to widen and open the mind. Why attention should be specially called to this answer by the Committee in their report is a riddle; I hope it was because they desired to show they could rise superior to the occasion. But the idea that science "can be learnt afterwards" is a very common one, and one of the most pernicious abroad. Learning from books and teachers is a lazy method of learning, and the average scholar is corrupted at an early age by exclusive resort to such methods. Much of the mental inertness of the day is acquired at school by over-indulgence in book study. But apart from this, early youth is the period when the mind is most alert and the desire to acquire and experiment greatest; it is the time when the powers of observing and of reasoning can be most easily developed into fixed habits; in fact, if they are not then developed, it is only in exceptional cases that the omission can be rectified in after life.

At bottom the spirit of commercialism is the cause of much of the contorted action we complain of. Neither Cambridge nor Oxford will take the step which has long been pressed upon them—and never more eloquently than by the Bishop of Hereford in his paper read before this Section last year—to make their entrance examination one which would be in accordance with our knowledge and the recognised needs of the times, and one which would have the effect of leading schools generally to impart the rudiments of a sound general education. They cannot act together, and are afraid to act singly, each fearing that it would prejudice its entry if it took a step in advance, and in any way sought to influence the schools. The colleges vie with each other in securing the best scholars in the hope of scoring in the general competition. And the schools have discovered that successes gained in examinations are the most effective means of advertising, and are therefore being turned more and more into establishments resembling those engaged in the manufacture of *pâté de foie gras*, in which the most crammable are tutored without the least consideration of the manner in which lifelong mental biliousness is engendered by the treatment. Parents, with strange perversity, worship the success achieved by Tom and Dick, Mary and Jane, and think they are doing their duty by their children in allowing them to be made use of—for private ends. The worst feature of the system is the narrow spirit of trades unionism which it has engendered, which leads to the worship for ever afterwards of those who have gained the prizes, instead of regarding them but as victors for the moment and requiring them at each step to give fresh proof of power. Nothing is more unwise than the way in which we overrate the pretensions of the "first-class" man; we too often make a prig of him by so doing. Those who succeed in examinations are too frequently not those most fitted for the work of the world. A long experience has convinced me that the boys a few places down a class are, as a rule, the best material. Those at the top may have acquisitive power, but more often than not they lack individuality and the power of exercising initiative. We must base our judgment in the future on evidence of training and of general conduct, not on isolated examinations. If any sincerity of purpose be left in us, if any sense of the value of true training—of what constitutes true training—can be rescued from the scholastic wreck on which we find ourselves at present embarked, we must institute some form of leaving examination which will give the requisite freedom to the schools and every opportunity for the development of individuality, and at the same time

necessitate thoroughness of training and patient regard of every grade of intelligence; leaders will show themselves and will not need to be examined for. Examinations as commercial enterprises must suffer an enforced bankruptcy.

At the present time, when the responsibility of controlling all grades of education is about to be cast upon the community, and the actual call to arms is imminent, it is imperative that a sound public policy should be framed, and that nothing should be allowed to stand in the way of the public good.

The first necessary step to take will be to reorganise the Education Department, root and branch; to imbue it throughout with sound ideals, and lead it to understand its great importance as the head centre of the educational system: for disestablish as we may, and however much we may favour local self-government, a head centre there must be to correlate the efforts made throughout the country and to distribute wisdom; but its functions will be those of an exchange and inquiry office rather than directive and assertive. At least, such is my reading of the tendency of the *zeitgeist*. Such a Department will have an Intelligence Board, whose members are partly official, partly unofficial, so that it may maintain itself in constant touch with outside opinion and effort. One function of this Board will be to preside at a monthly bonfire of red tape and official forms; for in future, even if no other subject of Government concern be kept in a lively and living state, education must infallibly be. The whole staff of the office, including the inspectorate, will be required to avail itself of that most valuable institution, the sabbatical year, *i.e.*, to spend every seventh year in some other employment, so that they may not forget that the world has ways sometimes different from those pictured within the office, and which it is advisable to take note of in education. Refreshed and invigorated, they will return to work, prepared to sacrifice all sorts of traditions, and to recognise the existence of short cuts across fields which had before appeared to be of interminable dimensions; and as it will be required that they spend a certain proportion of their close time in the company of children—if they have none of their own—they will learn that a child has ways and views of its own, none the less interesting and worthy of consideration because they are somewhat different from those of grown-up people.

I believe that gradually a complete revolution must take place in school procedure, and that the school building of the future will be altogether different from the conventional building of today, which is but an expansion of the monkish cell and the cloister. Instead of being a place fitted only for the rearing of what I have elsewhere termed desk-ridden emasculates, the school will be for the most part modelled on the workshop, giving to this term the most varied meaning possible, and a great part of the time will be spent at the work bench, tool in hand. Nature's workshop will, of course, be constantly utilised, and the necessary provision will be made for outdoor exercise and physical training. Scientific method will underlie the whole of education.

It will be recognised that education has two sides, a literary and a practical; that the mind can work through fingers; in fact, through all the senses; that it is not only embodied in the so-called intellect, a narrow creation of the schools. The practical training will therefore be regarded as at least equal in importance to the literary. Heads of schools will not only be potential bishops, but almost all careers will be open to them. In fact, I trust the system will be in operation which I have already advocated should be applied to the Education Department, and that the members of the school staff will be forced out into the world at stated intervals, so that they may not degenerate into pedants capable only of applying set rules much after the manner of that delightful creation Beckmesser in Wagner's opera "Die Meistersinger."

The class system will be largely abandoned. Children's school time will not be chopped up into regulated periods in a manner which finds no analogy in the work-a-day world, but they will have certain tasks confided to them to do and will be allowed considerable latitude in carrying them to completion. In fact, they will be treated as rational beings, and their individuality and self-respect developed from the outset. The Boer War will have taught us to adopt open-order teaching as well as open-order firing. Schools will glory in turning out individuals, not machines. The success of the Americans is largely due to the way in which republican doctrines are applied to the up-bringing of children in America. We must follow their example, and set our children free and encourage them to be free at an early age. The human animal develops at a sufficiently slow rate, in all conscience, and there is little need for man to retard his own development. School, with its checks upon freedom and individuality, should be quitted at seventeen at latest, I believe, and all subsequent systematic training should take place at college. Boys are kept at school after seventeen mainly for the purpose of the school. It is claimed that by remaining they gain most valuable experience by acting as monitors and prefects; but this experience is enjoyed only by the few, and might be obtained at an earlier age. Then it is said that seventeen is too early an age to enter Oxford or Cambridge, but this has only been the case since schools have retained boys to prepare them for examinations, and in order that they might assist in the management. I believe that the attempts which have been made in these latter days to do college work at schools and to establish engineering sides in order to find work for senior boys have had a most detrimental effect. It is said that the training given in technical schools is too far removed from practice; but how much more must this be true of technical work done under school conditions? The excessive devotion to literary methods favoured by schools and the older universities tends to develop unpractical habits which unfit many to face the rough-and-tumble life of the world, and is productive of a disinclination for practical avocations. By leaving school at a properly early period this danger is somewhat lessened; moreover, it is necessary in many walks of life that school should be left early in order that the school of practice may be entered sufficiently soon to secure the indispensable manual dexterity and habits. For a long time past we have been drifting away from the practical, and those who are acquainted with the work of the schools, especially the elementary schools, are aghast at the influence they are exercising in hindering the development of practical ability. We must in some way counteract this tendency. On the other hand, we have to meet the views of those who very properly urge that it is cruel to withdraw children from school even at the age we do. The two views must in some way be reconciled. The only way will be so to improve the teaching in schools that school becomes a palace of delight and the continuation schools a necessity. The habits formed at school should be such that study would never be intermitted on leaving school. At present school so nauseates the majority that on quitting it they have neither desire nor aptitude to study left in them: the work done in it is so impossible to translate into ordinary practice, so foreign to outside requirements.

The problem can only be solved by the scientific use of the imagination. The solution I would venture to offer is that an honest attempt be made to teach, not only the three R's, but also a fourth, Reasoning—the use of thought-power—and that a properly wide meaning be given to all the R's.

Thing advocated what I would advocate—the *incidental* method of teaching. Why should there be any set lesson in subjects such as history and geography? Nothing is worse, more stereotyped, more cramping to the intellect, than the set

lesson of so many lines or pages, of a sort of Liebig's Essence of information, with the attendant obligation of committing the facts recorded in them to memory. The child, like the restive, high-mettled young steed, wants to be off and away—not to be held severely in hand. Why should not the method by which we get up a subject in later life be followed in schools? At least, it should be properly tried. Let us give freedom to children, and at least during early years lead them to read hard and wisely; they will do so gladly; and give them pictures innumerable in illustration of their reading. And children must not only be taught to read books; they must learn also to regard and use them as sources of information; the habit of flying for information to books must be cultivated. They must be constantly referred to dictionaries and works of reference generally; they must be sent to hunt up all sorts of stories. Of course the scholastic Beckmesser will object that such a system is impossible, that there would be an end to all discipline; but to say this is to show a want of understanding of children and of faith in them, and is proof of failure to recognise their power of accepting responsibility when it is properly put upon them. The secret of success lies in beginning sufficiently early; once let them appreciate what they are doing and the majority will work eagerly and spontaneously.

But when the full meaning is given to the first of the R's, it will be held to cover not only the reading of printed or written characters, but also the reading of some of Nature's signs, to the end that sermons *may be* discovered in stones and good in everything. That is to say, at the same time that they are acquiring the true art of reading, they must be learning the true art of experimenting—to find out things by putting questions of their own and obtaining direct answers. The teaching of the elements of experimental science must, therefore, accompany the teaching of reading. And great care must be exercised that the palate for experimenting, for results, is not spoiled by reading. The use of text-books must be most carefully avoided at this stage, in order that that which should be elicited by experiment is not previously known and merely demonstrated—a most inferior method from any true educational point of view, and of little value as a means of developing thought-power. I regard Huxley's "Physiography," for example, as a type of the book to be avoided until method has been fully mastered. The great difficulty in the way of teaching the art of reading arises from the comparative paucity of readable books for young people. Text-books are not readable, and in fact tend to spoil reading; and the majority of books are written for grown-up people having considerable experience of the world. The mistake is too commonly made of expecting children to master "classics." On the other hand, we need not fear allowing advanced books to fall into the hands of children; they are the first to despise the namby-pamby stuff that is too frequently offered to them. A new literature must be created if education is to be put on a sound basis; something beyond mere word-painting is required. Books are wanted, written in a bright, attractive, and simple style, full of accurate information, which would carry us over the world and give clear pictures of all that is to be seen, as well as of the character and customs of its inhabitants; and books are wanted which, in like manner, would carry us back in time and sketch the history of the peoples of the earth. The various branches of science all need their popular exponents; our books are for the most part too technical, and whilst much has been done to advocate the introduction of "science" into general education, little has been done to make this possible. Unfortunately, those who attempt to write readable books are too frequently not those who are possessed of sound knowledge, and it is time that it were realised by those who could write well and accurately that there is a duty incumbent upon them; on the other hand, something should be done to stem the torrent of

text-books which is now flooding the field of education with the destroying force of a deluge, and making proper reading impossible.

The true use of books has yet to be found and admitted; we do not sufficiently recognise their value as stores of information and savers of brain waste. Why should long trains of facts be committed to memory but to be forgotten? It is impossible to believe that such a process is mental training; it must involve loss of energy and mental degradation. In future we must give the training at less cost, and teach the art of going to books for minute details whenever they are wanted. Nearly every subject is taught in an eminently selfish manner at the present time, the expert declaring that the learner must become acquainted with all the main facts of the subject, instead of recognising that it is far more important to acquire knowledge of first principles together with the power of acquiring the knowledge of facts whenever these become necessary.

The second R may be held to cover not only mere writing, but also composition. Why is the art of composition taught so badly? Because it is impossible for children to make bricks without straw: they have little to write about under ordinary school conditions. The subject is also one, I believe, which must be taught incidentally, at least during the earlier years, and chiefly in connection with the experimental work; in fact, to make this last the training it should be, an absolute record of all that is done must be properly written out, and while the work is being done too. Many teachers, I know, shy at this, and say that it is their business to teach "science," and not literary style; but they are wrong, and must inevitably accept the burden if they are to succeed in teaching "science" at all. An experiment, like an act, "hath three branches"—to conceive, to do, to utilise: a clearly defined motive must underlie it; it must be properly executed; the result must be interpreted and applied. It is only when the motive is clearly written out that it is clearly understood—that the meaning or intention of the experiment is clearly grasped; and this is equally true of the result. Of course, it is necessary to proceed slowly and not to demand too much from beginners; but it is surprising how the power grows. Drawing, of course, must be included under the second R; but this also may with advantage be taught incidentally, and only receive individual attention at a later stage, when those who show aptitude in the incidental work have been selected for higher instruction.

The third R must be held to cover, not merely the simple rules of arithmetic, and all that is necessary of formal mathematics, but also measurement work. Mathematics claims to be an exact subject, and therefore must be treated exactly, and made the means of inculcating training in exactness, and not on paper merely, but in fact. Moreover, physical science reposes on a basis of exact measurement, so that the introduction of experimental work into schools involves the introduction of measurement work as a matter of course.

The fourth R—Reasoning—will necessarily be taught in connection with every subject of instruction, not specifically. It is introduced as marking the absolute need of developing thought-power; and, in point of fact, should be put before all others in importance.

Under such a system as I suggest the time of study would be spent in two ways—in reading and experimenting. But whatever we do let us be thorough; the danger lies in attempting too much, too many things. Each step must be taken slowly and warily, and a secure position established before going further.

If we are to improve our schools the teachers must be trained to teach properly—or rather, let me say, must be put in the right way to teach, because practice and experience alone can give proficiency. This is the most difficult of all the problems to be faced in providing for the future. It is the one of all others to

be thought out with the greatest care, and in solving it the help of all who can help must be secured. No amount of didactic teaching will make teachers; the training must be practical. To graft on the ordinary training a course of lectures on the theory and practice of teaching plus a certain amount of practice in a school is not enough. How can we attempt to teach the theory and practice of teaching when we are agreed that we do not know how to teach most subjects? How can a master of method instruct us how to teach subjects of which he has only heard? It cannot be done; in point of fact, we are talking about the thing—beating about the bush—instead of treating the problem as one which can only be solved by experiment. To teach method, you must know your subject; one man cannot know many subjects. Of course there are quite a number of good general rules to be learnt, but the application of these must rest with the specialist; and the only proper way of giving training in method is to teach the subject in the way it seems desirable that it should be taught. The end result of training should be the development of a spirit of absolute humility—of the feeling that no task is so difficult as that of teaching properly, no career in which finality is more impossible to attain to, no career which offers greater opportunity for perpetual self-improvement. The effect of the narrow and unimaginative system in vogue to-day is to send forth a set of young persons who arrogantly consider that they are "trained"; if they would only think of the amount of preparation involved in training for athletic competitions, or in training race-horses even, they would entertain more modest views and be aware that they have everything to learn when they commence their work. The Beckmessers reign supreme in our training colleges of to-day; they must be got rid of, and true modest experts introduced in their place. The test of efficiency must be a real one, not that of a mere final examination. The inspectors must see to it that the instruction is given always with a view to the fact that the students are to become teachers, which at present seems to be the last consideration borne in mind. Every effort must be made to secure a higher class of student for the training colleges; a fair secondary training *must be insisted on*. A narrow spirit of trades unionism pervades the primary-school system at the present time, and school boards and managers of pupil teachers' centres make no effort to secure the assistance of secondary teachers.

My receipt for a training college would be: Develop thought-power and individuality; develop imagination. Teach whatever will do this most effectively, and let special subjects be studied in the way that may best be followed in teaching them subsequently.

It is to the lasting shame of our state organisation and of our school boards that so little has been done to provide competent teachers.

The future rests with the universities; but to save the nation the universities must be practical, and broader conceptions must prevail in them. A course of training which will give true culture must be insisted on. The universities have recently shown a disposition—to use a vulgarism—to throw themselves at the heads of the military authorities, and to make special provision for the training of military students. It is much more their office to train teachers. Why should not the example to hand in the engineering school at Cambridge be followed? Why should not a special tripos be established for teachers in training? I believe this to be the true solution of the problem.

But I must now bring this address to a conclusion. The only apology that I can offer for its length is that having had over thirty years' experience as a teacher, and being profoundly impressed by the serious character of the outlook, the opportunity being given me, I felt that, as the walrus said to the carpenter—

The time has come . . .
 To talk of many things :
 Of shoes, and ships, and sealing-wax,
 Of cabbages, and kings,
 And why the sea is boiling hot,
 And whether pigs have wings.
 ("Alice through the Looking-glass.")

This list of subjects is no more varied and disconnected—the problems set no deeper—than those to which we must give our attention in dealing with education ; and the sooner the fate of the oysters is that of our present educational "system" the better. Having shown by this quotation that I am not an absolute modern, but have some knowledge of the classics, let me finally say, in the words of another poet—of him who on various occasions gave utterance to much wisdom at the breakfast table—that "I don't want you to believe anything I say, I only want you to try to see what makes me believe it."

REPORT OF THE BRITISH ASSOCIATION COMMITTEE ON THE TEACHING OF MATHEMATICS.¹

IN submitting their present report, the Committee desire to point out that this is not the first occasion on which the British Association has attempted to deal with the teaching of elementary mathematics. About thirty years ago, a similar body was appointed to consider a part of the subject, viz., "the possibility of improving the methods of instruction in elementary geometry"; and two reports were presented, one at the Bradford meeting in 1873 (see the Report volume for that year, p. 459), the other at the Glasgow meeting in 1876 (see the Report volume for that year, p. 8).

The two reports advert to some of the difficulties that obstruct improvements in the teaching of geometry. One of these is alleged to be "the necessity of one fixed and definite standard for examination purposes"; apparently, it was assumed that this fixed and definite standard should not merely be required from all candidates in any one examination, but also be applied to all examinations throughout the country. In order to secure the uniformity thus postulated, the Committee, thinking that no text-book had been produced fit to succeed Euclid in the position of authority, and deeming it improbable that such a book could be produced by the joint action of selected individuals, suggested the publication of an authorised syllabus. In their second report, they discussed the merits of a particular syllabus—that of the Association for the Improvement of Geometrical Teaching; but, in spite of such commendation as was then expressed, the syllabus has not been generally adopted.

It is still true that (in the words of the former Committee) "in this country at present teaching is guided largely by the requirements of examinations." For some time to come, the practice of the country is not unlikely to allow examinations to retain at least a partial domination over teaching in schools. Accordingly, if the teaching is to be improved, it seems to be a preliminary requisite that examinations should be modi-

fied; and, where it is possible, these modifications in the examinations should leave greater freedom to the teacher, and give him more assistance than at present.

On the other hand, there is a tendency in this country whereby, in such matters as teaching and examination, the changes adopted are only gradually effected, and progress comes only by slow degrees. Accordingly, the general recommendations submitted in this report are such that they can be introduced easily and without any great alteration of the best present practice. It is the hope of the Committee that the recommendations, if adopted, will constitute merely the first stage in a gradual improvement both of teaching and of examinations. For the most part, only broad lines of change are suggested: this has been done in order to leave as much freedom as possible to teachers for the development of their methods in the light of their experience.

Is Uniformity Imperative?

The Committee do not consider that a single method of teaching mathematics should be imposed uniformly upon all classes of students; for the only variations then possible would be limited by the individuality of the teacher. In their opinion, different methods may be adopted for various classes of students, according to the needs of the students; and corresponding types of examination should be used.

It is generally, if not universally, conceded that a proper training in mathematics is an important part of a liberal education. The value of the training depends upon the comprehension of the aims of the mathematical subjects chosen, upon the grasp of the fundamental notions involved, and upon the attention paid to the logical sequence of the arguments. On the other hand, it is freely claimed that, in the training of students for technical aims such as the profession of engineering, a knowledge of results and a facility in using them are more important than familiarity with the mathematical processes by which the results are established with rigid precision. This divergence of needs belongs, however, to a later stage in the training of students. In the earliest stages, when the elements of mathematics are being acquired, the processes adopted can be substantially the same for all students; and many of the following recommendations are directed towards the improvement of those processes.

Teaching of Practical Geometry.

The former Committee recommended (and the present Committee desire to emphasise the recommendation) that the teaching of demonstrative geometry should be preceded by the teaching of practical and experimental geometry, together with a considerable amount of accurate drawing and measurement. This practice should be adopted, whether Euclid be retained, or be replaced by some authorised text-book or syllabus, or if no authority for demonstrative geometry be retained.

Simple instruments and experimental methods should be employed exclusively in the earliest stages, until the learner has become familiarised with some of the notions of geometry and some of the properties of geometrical figures, plane and solid. Easy deductive reasoning should be introduced as soon as possible; and thereafter the two processes should be employed side by side, because practical geometry can be made an illuminating and interesting supplement to the reasoned results obtained in demonstrative geometry. It is desirable that the range of the practical course and the experimental methods adopted should be left in large measure to the judgment of the teacher; and two schedules of suggestions, intended for different classes of students, have been submitted to the Committee by Mr. Eggar and Professor Perry respectively, and are added as an appendix to this Report.

¹ Brought before the Educational Section of the Association at Belfast on September 12th. The Committee was appointed to report upon improvements that might be effected in the teaching of mathematics, in the first instance in the teaching of elementary mathematics, and upon such means as they think likely to effect such improvements. The members of the Committee were Prof. Chrystal, Mr. W. D. Eggar, Mr. H. W. Eve, Prof. Forsyth (Chairman), Prof. Gibson, Dr. Gladstone, Prof. Greenhill, Prof. R. A. Gregory, Prof. Henrici, Prof. Hudson, Dr. Larmor, Prof. A. Lodge, Principal O. Lodge, Prof. Love, Major MacMahon, Prof. Minchin, Prof. Perry (Secretary), Principal Rücker, Mr. Robert Russell, and Prof. S. P. Thompson. The report was drawn up by the Chairman.

Should there be a Single Authority in Geometry?

In the opinion of the Committee, it is not necessary that one (and only one) text-book should be placed in the position of authority in demonstrative geometry; nor is it necessary that there should be only a single syllabus in control of all examinations. Each large examining body might propound its own syllabus, in the construction of which regard would be paid to the average requirements of the examinees.

Thus an examining body might retain Euclid to the extent of requiring his logical order. But when the retention of that order is enforced, it is undesirable that Euclid's method of treatment should always be adopted; thus the use of hypothetical constructions should be permitted. It is equally undesirable to insist upon Euclid's order in the subject-matter; thus a large part of the contents of Books III. and IV. could be studied before the student comes to the consideration of the greater part of Book II.

In every case, the details of any syllabus should not be made too precise. It is preferable to leave as much freedom as possible, consistently with the range to be covered; for in that way the individuality of the teacher can have its most useful scope. It is the competent teacher, not the examining body, who can best find out what sequence is most suited educationally to the particular class that has to be taught.

A suggestion has been made that some Central Board might be instituted to exercise control over the modifications made from time to time in every syllabus issued by an examining body. It is not inconceivable that such a Board might prove useful in helping to avoid the logical chaos occasionally characteristic of the subject known as Geometrical Conics. But there is reason to doubt whether the authority of any such Central Board would be generally recognised.

Opinions differ as to whether arithmetical notions should be introduced into demonstrative geometry, and whether algebraic methods should be used as substitutes for some of the cumbersome formal proofs of propositions such as those in Euclid's Second Book: for opinions differ as to the value of strictly demonstrative geometry, both for training and for knowledge. Those teachers who do not regard algebraic methods as proper substitutes for geometrical methods might still use them, as well as arithmetical notions, for the purpose of illustrating a proposition or explaining its wider significance. It is the general opinion of the Committee that some association of arithmetic and algebra with geometry is desirable in all cases where this may be found possible; the extent to which it may be practised will depend largely upon the individual temperament of the teacher.

Every method of teaching demonstrative geometry has to face the difficulties inevitably associated with any complete and rigorous theory of proportion. In the opinion of the Committee, not merely is Euclid's doctrine of proportion unsuited for inclusion in elementary work, but it belongs to the class of what may be called university subjects. The Committee consider that the notion of proportion to be adopted in a school course should be based upon a combination of algebraical processes with the methods of practical geometry.

Examinations in Geometry.

As regards examinations in geometry, the Committee consider that substantial changes in much of the present practice are desirable. In most, if not in all, of the branches of mathematics, and especially in geometry, the examination ought to be arranged so that no candidate should be allowed to pass unless he gives evidence of some power to deal with questions not included in the text-book adopted. Such questions might comprise riders of the customary type, arithmetical

and algebraical illustrations and verifications, and practical examples in accurate drawing and measurement. The Committee consider the latter of particular importance when the range is of an elementary character; some influence will be exercised upon the teaching, and some recognition will be given to the course of practical geometry that should be pursued in the earlier stages.

Arithmetic and Algebra.

The Committee are of opinion that, in the processes and explanations belonging to the early stages of these subjects, constant appeal should be made to concrete illustrations.

In regard to arithmetic, the Committee desire to point out, what has been pointed out so often before, that, if the decimal system of weights and measures were adopted in this country, a vast amount of what is now the subject-matter of teaching and of examination could be omitted as being then useless for any purpose. The economy in time, and the advantage in point of simplification, would be of the greatest importance. But such a change does not seem likely to be adopted at present; and the Committee confine themselves to making certain suggestions affecting the present practice. They desire, however, to urge that teachers and examiners alike should deal with only those tables of weights and measures which are the simplest and of most frequent practical use.

In formal arithmetic, the elaborate manipulation of vulgar fractions should be avoided, both in teaching and in examinations; too many of the questions that appear in examination papers are tests rather of mechanical facility than of clear thinking or of knowledge. The ideas of ratio and proportion should be developed concurrently with the use of vulgar fractions. Decimals should be introduced at an early stage, soon after the notion of fractions has been grasped. Methods of calculation, accurate only to specified significant figures, and, in particular, the practice of contracted methods, should be encouraged. The use of tables of simple functions should be begun as soon as the student is capable of understanding the general nature of the functions tabulated; for example, the use of logarithms in numerical calculation may be begun as soon as the fundamental law of indices is known.

In regard to the early stages of algebra, the modifications (both in teaching and in the examinations) which are deemed desirable by the Committee are of a general character.

At first, the formulæ should be built on a purely arithmetical foundation, and their significance would often be exhibited by showing how they include whole classes of arithmetical results. Throughout the early stages, formulæ and results should frequently be tested by arithmetical applications. The arithmetical basis of algebra could be illustrated for beginners by the frequent use of graphs; and the practice of graphical processes in such cases can give a significance to algebraical formulæ that would not otherwise be obtained easily in early stages of the subject.

In passing to new ideas, only the simplest instances should be used at first, frequent reference still being made to arithmetical illustrations. Advance should be made by means of essential development, avoiding the useless complications of merely formal difficulties which serve no other purpose than that of puzzling candidates in examinations. Many of the artificial combinations of difficulties could be omitted entirely; the discussion of such as may be necessary should be postponed from the earlier stages. Teachers and examiners alike should avoid matters such as curious combinations of brackets; extravagantly complicated algebraic expressions, particularly fractions; resolutions of elaborate expressions into factors; artificially difficult combinations of indices; ingeniously manipulated equations; and the like. They have no intrinsic value or importance; it is

only the mutual rivalry between some writers of text-books and some examiners that is responsible for the consideration which has been conceded to such topics.

General Remarks.

If general simplification either on these or on similar lines be adopted, particularly if graphical methods are freely used, it will be found possible to introduce, quite naturally and much earlier than is now the case, some of the leading ideas in a few subjects that usually are regarded as more advanced. Thus the foundations of trigonometry can be laid in connection with the practical geometry of the subject-matter of the Sixth Book of Euclid. The general idea of co-ordinate geometry can be made familiar by the use of graphs; and many of the notions underlying the methods of the infinitesimal calculus can similarly be given to comparatively youthful students long before the formal study of the calculus is begun.

APPENDIX.

Two Suggested Schedules of Experimental Geometry.

(Scheme submitted by Mr. Eggar, chiefly Geometrical, on Euclidean Lines.)

Accurate measurements of lines, angles, areas, and (if possible) volumes, should precede any formal definitions. The following suggestions are intended for the earliest stages.

Instruments.—Hard pencil, compasses, dividers, straight edge graduated in inches and tenths, and in centimetres and millimetres; protractor (if rectangular, its connection with the division of the circle should be carefully pointed out); set-squares (45° and 60°); notebook of squared paper; tracing paper; scissors and loose paper for cutting out and folding.

It is important that careful draughtsmanship and the use of properly-adjusted instruments should be insisted on. All constructions should be drawn in fine pencil lines. Inaccurate work, or work done with soft or blunt pencils, should receive very little credit.

Processes.—Test of a straight line; intersection of two lines; notion (not definition) of a point; measurement of a length; estimation of the second place of decimals of inches or centimetres; use of set-squares for drawing parallel lines; construction and measurement of angles from 0° to 360° by the use of a protractor; limits of error in setting off angles; test of a right angle; test for accuracy of set-squares; their use in drawing perpendiculars.

The drawing of parallels and perpendiculars by the aid of compasses; the bisection of angles and straight lines; construction of triangles from given dimensions; the fundamental properties of triangles verified and illustrated by drawing; similar triangles; the division of lines into equal parts and into parts in given proportion; test of equality of angles by the superposition of the angles of similar (not equal) triangles by means of tracing paper.

The construction of rectangles, parallelograms, and quadrilaterals, from adequate data; notion of a tangent line; construction of tangents to circles, using drawing-office methods; notion of a locus; construction of circles satisfying given conditions; verification of the properties of circles.

Measurement of area; use of squared paper; area of an irregular figure found by counting the number of squares.

Illustrations of propositions relating to the areas of squares, rectangles, parallelograms, and triangles. Calculation of these areas from given dimensions (*e.g.*, base and altitude), and verification by squared paper.

The length of the circumference of a circle determined experimentally (*e.g.*, by rolling a coin with an ink mark on its

rim down an inclined sheet of paper, or by wrapping a strip of paper tightly round a cylinder, pricking the paper where it overlaps, unwrapping and measuring the distance between the two marks); the area of a circle determined by squared paper.

The area of a rectangular sheet of paper can be calculated from measurements in inches and in centimetres, and hence the number of square centimetres in a square inch can be obtained by division. To how many places of decimals may the result be regarded as accurate?

Construction of paper models of solids to illustrate the notions of surface and volume.

Measurement of volume should be illustrated by cubical bricks. Cubes of one inch and one centimetre can be obtained cheaply. Volumes of rectangular solids, prisms, cylinders, and cones, should be measured where possible, and the results verified by displacement of water if access to a physics laboratory is to be had. Measurements of area and volume form a useful introduction to the notion of an algebraic formula.

As a pupil advances in elementary algebra, geometrical illustrations may be employed with advantage, *e.g.*, the verification with squared paper of the formulæ corresponding to the propositions of Euclid, Book II., graphs, the solution of quadratic equations with ruler and compasses.

(Scheme submitted by Professor Perry: this scheme is intended to accompany a Course of Arithmetic, Algebra, and Experimental Science.)

Practice in decimals, using scales for measuring such distances as 3.22 inches, or 12.5 centimetres.

Contracted and approximate methods of multiplying and dividing numbers; using rough checks in arithmetical work; evaluating formulæ.

Mensuration.—Testing experimentally the rule for the length of the circumference of a circle, using strings or a tape measure round cylinders, or by rolling a disc or sphere, or in other ways; inventing methods of measuring approximately the lengths of curves; testing the rules for the areas of a triangle, rectangle, parallelogram, circle, ellipse, surface of cylinder, surface of cone, &c., using scales and squared paper; propositions in Euclid relating to areas tested by squared paper, also by arithmetical work on actual measurements; the determination of the areas of an irregular plane figure (1) by using Simpson's or other well-known rules for the case where a number of equidistant ordinates or widths are given; (2) by the use of squared paper when equidistant ordinates are not given, finding such ordinates; (3) weighing a piece of cardboard and comparing with the weight of a square piece; (4) counting squares on squared paper to verify rules. Rules for volumes of prisms, cylinders, cones, spheres, and rings, verified by actual experiment; for example, by filling vessels with water, or by weighing objects of these shapes made of material of known density, or by allowing such objects to cause water to overflow from a vessel.

The determination of the volume of an irregular solid by each of the three methods for an irregular area, the process being first to obtain an irregular plane figure in which the varying ordinates or widths represent the varying cross-sections of the solid; volumes of frusta of pyramids and cones; computation of weights from volumes when densities are given.

Stating a mensuration rule as an algebraic formula. In such a formula any one of the quantities may be the unknown one, the others being known. Numerical exercises in mensuration. The experimental work in this subject ought to be taken up in connection with practice in weighing and measuring generally, finding specific gravities, illustrations of the principle of Archi-

medes, the displacement of floating bodies, and other elementary scientific work. A good teacher will not overdo this experimental work; he will preserve a proper balance between experimental work, didactic teaching, and numerical exercise work.

Use of squared paper.—The use of squared paper by merchants and others to show at a glance the rise and fall of prices, of temperature, of the tide, &c. The use of squared paper should be illustrated by the working of many kinds of exercises, but it should be pointed out that there is a general idea underlying them all. The following may be mentioned:—

Plotting of statistics of any kind whatsoever of general or special interest; what such curves teach; rates of increase.

Interpolation, or the finding of probable intermediate values; probable errors of observation; forming complete price lists by manufacturers; finding an average value; areas and volumes as explained above.

The plotting of simple graphs; determination of maximum and minimum values; the solution of equations. Very clear notions of what we mean by the roots of equations may be obtained by the use of squared paper.

Determination of laws which exist between observed quantities, especially of linear laws.

Corrections for errors of observation when the plotted quantities are the results of experiment.

Geometry.—A knowledge of the properties of straight lines, parallel lines, right angles, and angles of 30° , 45° , and 60° , obtained by using and testing straight-edges and squares; dividing lines into parts in given proportions, and other experimental illustrations of the Sixth Book of Euclid; the definitions of the sine, cosine, and tangent of an angle, and the determination of their values by graphical methods; setting out of angles by means of a protractor, when they are given in degrees or radians, also (for acute angles) by construction when the value of the sine, cosine, or tangent is given; use of tables of sines, cosines, and tangents; the solution of a right-angled triangle by calculation and by drawing to scale; the construction of any triangle from given data; determination of the area of a triangle. The more important propositions of Euclid may be illustrated by actual drawing. If the proposition is about angles, these may be measured in degrees by means of a protractor, or by the use of a table of chords; if it refers to the equality of lines, areas, or ratios, lengths may be measured by a decimal scale, and the necessary calculations made arithmetically. This combination of drawing and arithmetical calculation may be freely used to illustrate the truth of a proposition. A good teacher will occasionally introduce demonstrative proof as well as mere measurement.

Defining the position of a point in space by its distances from three co-ordinate planes. What is meant by the projection of a point, line, or a plane figure, on a plane? Simple models may be constructed by the student to illustrate the projections of points, lines, and planes.

The distinction between a scalar quantity and a vector quantity; addition and subtraction of vectors; experimental illustrations, such as the verification by the student himself of the triangle and polygon of forces, using strings, pulleys, and weights.

Step by Step. By S. C. Peabody. iv. + 98 pp. (Ginn.) 1s. 3d.—This nicely-produced primer will make learning to read a pleasant task for children. The coloured illustrations especially will be a continual source of delight to young beginners. But it is a pity that the colour marked blue on page 91 is, in the copy before us, nothing of the sort.

THE PRELIMINARY EDUCATION OF THE ENGINEER.¹

WHEN a man has become a great engineer, and he is asked how it happened, what his education has been, how young engineers ought to be trained, as a rule it is a question that he is least able to answer, and yet it is a question that he is most ready to answer. He sees that he benefited greatly by overcoming certain difficulties in his life; and forgetting that every boy will have difficulties enough of his own, forgetting that although a few difficulties may be good for discipline many difficulties may be overwhelming, forgetting also that he himself is a very exceptional man, he insists upon it that those difficulties which were personal to himself ought to be thrown in the path of every boy. It often happens that he is a man who is accustomed to think that early education can only be given through ancient classics. He forgets the dulness, the weariness of his schooldays. Whatever pleasure he had in youth—pleasure mainly due to the fact that the average Anglo-Saxon boy invents infinite ways of escaping school drudgery—he somehow connects with the fact that he had to learn classics. Being an exceptional boy, he was not altogether stupefied, and did not altogether lose his natural inclination to know something of his own language; and he is in the habit of thinking that he learnt English through Latin, and that ancient classics are the best mediums through which an English boy can study anything.² The cleverest men of our time have been brought up on the classics, and so the engineer who cannot even quote correctly a tag from the Latin grammar, who never knew anything of classical literature, insists upon it that a classical education is essential for all men. He forgets the weary hours he spent getting off Euclid, and the relief it was to escape from the class-room not quite stupefied, and he advocates the study of pure mathematics and abstract dynamics as absolutely necessary for the training of the mind of every young engineer. I have known the ordinary abominable system of mathematical study to be advocated by engineers who, because they had passed through it themselves, had really got to loathe all kinds of mathematics higher than that of the grocer or housekeeper. They said that mathematics had trained their minds, but they did not need it in their profession. There is no profession which so much requires a man to have the mathematical tool always ready for use on all sorts of problems, the mathematical habit of thought the one most exercised by him; and yet these men insist upon it that they can get all their calculations done for them by mathematicians paid so much a week. If they really thought about what they were saying, it would be an expression of the greatest contempt for all engineering computation and knowledge. He was pitchforked into works with no knowledge of mathematics, or dynamics, or physics, or chemistry, and, worse still, ignorant of the methods of study which a study of these things would have produced; into works where there was no man whose duty it was to teach an apprentice; and because he, one in a thousand, has been successful, he assures us that this pitchforking process is absolutely necessary for every young engineer. He forgets that the average boy leaves an English school with no power to think for himself, with a hatred of books, with less than none of the knowledge which might help him to understand what he sees, and he has learnt what is called mathematics in such a

¹ From an Address to the Engineering Section of the British Association for the Advancement of Science, delivered by Prof. John Perry, M.E., D.Sc., LL.D., F.R.S., President of the Section, at Belfast, September 11th, 1902.

² The very people who talk so much of learning English through Latin neglect in the most curious ways those Platt-Deutsch languages, Dutch and Scandinavian, a knowledge of which is ten times more valuable in the study of what is becoming the speech of the world. And how they do so. Lowland Scotch!

fashion that he hates the sight of an algebraic expression all his life after.

I do not want to speak of boys in general. I want only to speak of the boy who may become an engineer, and before speaking of his training I want to mention his essential natural qualification—that he really wishes to become an engineer. I take it to be a rule to which there are no exceptions that no boy ought to enter a profession—or rather, to continue in a profession—if he does not love it. We all know the young man who thinks of engineering things during office hours and never thinks of them outside office hours. We know how his fond mother talks of her son as an engineer who, with a little more family influence and personal favour, and if there was not so much competition in the profession, would do so well. It is true, family influence may perhaps get such a man a better position, but he will never be an engineer. He is not even fit to be a hewer of wood and drawer of water to engineers. Love for his profession keeps a man alive to its interests all his time, although, of course, it does not prevent his taking an interest in all sorts of other things as well; but it is only a professional problem that warms him through with enthusiasm. I think we may assume that there never yet was an engineer worth his salt who was not fond of engineering, and so I shall speak only of the education of the young man who is likely to be fond of engineering.

How are we to detect this fondness in a boy? I think that if the general education of all boys were of the rational kind which I shall presently describe, there would be no great difficulty; but, as the present academic want of system is likely to continue for some time, it is well to consider things as they are. Mistakes must be made, and the parent who tries during the early years of his offspring to find out by crafty suggestion what line his son is likely to wish to follow will just as probably do evil by commission as the utterly careless parent is likely to do evil by omission. He is like the botanical enthusiast who digs up plants to see how they are getting on. But in my experience the Anglo-Saxon boy can stand a very great deal of mismanagement without permanent hurt, and it can do no kind of boy any very great harm to try him on engineering for a while. Even R. L. Stevenson, whose father seems to have been very persistent indeed in trying to make an engineer of him against his will, does not seem, to a Philistine like myself, to have been really hurt as a literary man through his attendance on Fleeming Jenkin's course at Edinburgh—on the contrary, indeed. It may be prejudice, but I have always felt that there is no great public person of whom I have ever read who would not have benefited by the early training which is suitable for an engineer. I am glad to see that Mr. Wells, whose literary fame, great as it is, is still on the increase, distinguishes the salt of the earth, or saviours of society, from the degraded, useless, luxurious, pleasure-loving people doomed to the abyss, by their having had the training of engineers and by their possessing the engineer's methods of thinking.

It may be that there are some boys of great genius to whom all physical science or application of science is hateful. I have been told that this is so, and if so I still think that only gross mismanagement of a youthful nature can have produced such detestation. For such curious persons engineering experience is, of course, quite unsuitable. I call them "curious" because every child's education in very early years is one in the methods of the study of physical science; it is Nature's own method of training, which proceeds successfully until it is interfered with by ignorant teachers who check all power of observation and the natural desire of every boy to find out things for himself. If he asks a question, he is snubbed; if he observes Nature as a loving student, he is said to be lazy and a dunce, and is punished as being neglectful of school work. Unprovided with apparatus, he makes experiments in his own way, and he is said to be

destructive and full of mischief. But however much we try to make the wild ass submit to bonds and the unicorn to abide by the crib, however bullied and beaten into the average schoolboy type, I cannot imagine any healthy boy suffering afterwards by part of a course of study suitable for engineers, for all such study must follow Nature's own system of observation and experiment. Well, whether or not a mistake has been made, I shall assume the boy to be likely to love engineering, and we have to consider how he ought to be prepared for his profession.

I want to say at the outset that I usually care only to speak of the average boy, the boy usually said to be stupid, ninety-five per cent. of all boys. Of the boy said to be exceptionally clever I need not speak much. Even if he is pitchforked into works immediately on leaving a bad school, it will not be long before he chooses his own course of study and follows it, whatever course may have been laid down for him by others.

Perhaps I had better state plainly my views as to what general education is best for the average English boy. The public schools of England teach English through Latin, a survival of the time when only special boys were taught at all, and when there was only one language in which people wrote. Now the average boy is also taught Latin, and when he leaves school for the army, or any other pursuit open to average boys, he cannot write a letter, he cannot construct a grammatical sentence, he cannot describe anything he has seen. The public-school curriculum is always growing, and it is never subtracted from or rearranged. There is one subject which ordinary schoolmasters can teach well—Latin.¹ The other usual nine subjects have gradually been added to the curriculum for examination purposes: they are taught in water-tight compartments—or, rather, they are only crammed, and not taught at all. Our school system resembles the ordinary type of old-established works, where gradual accretion has produced a higgledy-piggledy set of shops which one looks at with stupefaction, for it is impossible to get business done in them well and promptly, and yet it seems impossible to start a reform anywhere. What is wanted is an earthquake or a fire—a good fire—to destroy the whole works and enable the business to be reconstructed on a consistent and simple plan. And for much the same reason our whole public-school system ought to be "scrapped." What we want to see is that a boy of fifteen shall be fond of reading, shall be able to compute, and shall have some knowledge of natural science; or, to put it in another way, that he shall have had mental training in the study of his own language, in the experimental study of mathematics, and in the methods of the student

¹ Only one subject—Latin—is really educational in our schools. I do not mean that the average boy reads any Latin author after he leaves school, or knows any Latin at all ten years after he leaves school. I do not mean that his Latin helps him even slightly in learning any modern language, for he is always found to be ludicrously ignorant of French or German, even after an elaborate course of instruction in these languages. I do not mean that his Latin helps him in studying English, for he can hardly write a sentence without error. I do not mean that it makes him fond of literature, for of ancient literature or history he never has any knowledge except that Cæsar wrote a book for the third form, and on English literature his mind is a blank. But I do mean that, as the ordinary public-school master is really able to give a boy easy mental exercises through the study of Latin, this subject is in quite a different position from that of the others. If any proof of this statement is wanted, it will be found in the published utterances of all sorts of men—military officers, business men, lawyers, men of science, and others—who, confessedly ignorant of "the tongues," get into a state of rapture over their school experiences and the efficiency of Latin as a means of education. All this comes from the fact, which schoolboys are sharp enough to observe, that English schoolmasters can teach Latin well, and they do not take much interest in teaching anything else. It is a power inherited from the Middle Ages, when there really was a simple system of education. I ask for a return to simplicity of system. English (the King's English; I exclude Johnsonese) is probably the richest, the most complex language, the one most worthy of philologic study; English literature is certainly more valuable than any ancient or modern literature of any one other country, yet admiration for it among learned Englishmen is wonderfully mixed with patronage and even contempt. At present, is there one man who can teach English as Latin is taught by nearly every master of every school? Just imagine that English could be so taught by teachers capable of rising to the level of our literature!

of natural science. Such a boy is fit to begin any ordinary profession, and whether he is to enter the Church, or take up medicine or surgery, or become a soldier, every boy ought to have this kind of training. When I have advocated this kind of education in the past I have usually been told that I was thinking only of boys who intend to be engineers; that it was a specialised kind of instruction. But this is very untrue. Let me quote from the recommendations of the 1902 Military Education Committee (Report, p. 5):—

"The fifth subject which may be considered as an essential part of a sound general education is experimental science; that is to say, the science of physics and chemistry treated experimentally. As a means of mental training, and also viewed as useful knowledge, this may be considered a necessary part of the intellectual equipment of every educated man, and especially so of the officer, whose profession in all its branches is daily becoming more and more dependent on science." When statements of this kind have been made by some of us in the past, nobody has paid much attention; but I beg you to observe that the Headmaster of Eton and the Headmaster of St. Paul's School are two of the members of the important Committee who signed this recommendation, and it is impossible to ignore it. Last year, for the first time, the President of the Royal Society made a statement of much the same kind, only stronger, in his annual address. I am glad to see that the real value of education in physical science is now appreciated; that mere knowledge of scientific facts is known to be unimportant compared with the production of certain habits of thought and action which the methods of scientific study usually produce.

As to English, the Committee say: "They have no hesitation in insisting that a knowledge of English, as tested by composition, together with an acquaintance with the main facts of the history and geography of the British Empire, ought in future to hold the *first* place in the examination and to be exacted from all candidates." The italics are mine. It will be noticed that they say nothing about the practical impossibility of obtaining teachers. As to mathematics, the Committee say: "It is of almost equal importance that every officer should have a thorough grounding in the elementary part of mathematics. But they think that elementary mechanics and geometrical drawing, which under the name of practical geometry is now often used as an introduction to theoretical instruction, should be added to this part of the examination, so as to ensure that at this stage of instruction the practical application of mathematics may not be left out of sight." As Sir Hugh Evans would have said, "It is a very discretion answer—the meaning is good"; but I would that the Committee had condemned abstract mathematics for these army candidates altogether.

This report appears in good time. It would be well if committees would sit and take evidence as to the education of men in the other professions entered by our average boys. It is likely that when an authoritative report is prepared on the want of education of clergymen, for example, exactly the same statements will be made in regard to the general education which ought to precede the technical training; but perhaps a reference may be made in the report to the importance of a study of geology and biology as well as physical science. Think of the clergyman being able to meet his scientific enemies in the gate!

Thanks mainly to the efforts of a British Association Committee, really good teaching of experimental science is now being introduced into all public schools, in spite of most persistent opposition wearing an appearance of friendliness. In consequence, too, of the appointment of a British Association Committee last year, at what might be called the psychological moment, a great reform has already begun in the teaching

of mathematics.¹ Even in the regulations for the Oxford Locals for 1903 Euclid is repudiated. It seems probable that at the end of another five years no average boy of fifteen years of age will have been compelled to attempt any abstract reasoning about things of which he knows nothing; he will be versed in experimental mathematics, which he may or may not call mensuration; he will use logarithms, and mere multiplication and division will be a joy to him; he will have a working power with algebra and sines and cosines; he will be able to tackle at once any curious new problem which can be solved by squared paper; and he will have no fear of the symbols of the infinitesimal calculus. When I insist that a boy ought to be able to compute, this is the sort of computation that I mean. Four years hence it will be called "elementary mathematics." Four years ago it was an unorthodox subject called "practical mathematics," but it is establishing itself in every polytechnic and technical college and evening or day science-school in the country. Several times I have been informed that on starting an evening class, when plans have been made for a possible attendance of ten or twenty students, the actual attendance has been 200 or 300. Pupils may come for one or two nights to a class on academic mathematics, but then stay away for ever; a class in practical mathematics maintains its large numbers to the end of the winter.²

Hitherto the average boy has been taught mathematics and mechanics as if he were going to be a Newton or a Laplace; he learned nothing and became stupid. I am sorry to say that the teaching of mechanics and mechanical engineering through experiment is comparatively unknown. Cambridge writers and other writers of books on experimental mechanics are unfortunately ignorant of engineering. University courses on engineering—with one splendid exception, under Professor Ewing at Cambridge—assume that undergraduates are taught their mechanics as a logical development of one or two axioms; whereas in many technical schools under the Science and Art Department apprentices go through a wonderfully good laboratory course in mechanical engineering. We really want to give only a few fundamental ideas about momentum and the transformations of energy and the properties of materials, and to give them from so many points of view that they become part of a student's mental machinery, so that he uses them continually. Instead of giving a hundred labour-saving rules which must be forgotten, we ought to give the one or two ideas which a man's common-sense will enable him to apply to any problem whatsoever and cannot be forgotten. A boy of good mathematical attainments may build on this experimental knowledge afterwards a superstructure more elaborate than Rankine or Kelvin or Maxwell ever dreamt of as being possible. Every boy will build some superstructure of his own.

I must not dwell any longer on the three essential parts of a good general education which lead to the three powers which all boys of fifteen ought to possess; power to use books and to enjoy reading; power to use mathematics and to enjoy its use; power to study Nature sympathetically. English board-school boys who go to evening classes in many technical schools after they become apprentices are really obtaining this kind of education. The Scotch Education Board is trying to give it to all boys in primary and secondary schools. It will, I fear, be some time before the sons of well-to-do parents in England have a chance of obtaining it.

¹ Discussion last year and report of Committee, published by Messrs. Macmillan.

² To many men it will seem absurd that a real working knowledge of what is usually called higher mathematics, accompanied by mental training, can be given to the average boy. In the same way it seemed absurd 500 years ago that power to read and write and cipher could be given to everybody. These general beliefs of ours are very wonderful.

EDUCATION AND PROGRESS.

WE have dealt in more detail with the proceedings of the Educational Science section of the British Association meeting at Belfast in another part of this issue (p. 381), and selections from the presidential addresses of Profs. Armstrong and Perry are given on pp. 383 and 392. Other leading speakers, however, referred to topics of direct interest to schoolmasters, and it is here proposed to make a few extracts from their remarks.

Why England is losing her Trade.

The President of the Association, Prof. James Dewar, before discussing the main subject of his address, referred to several questions of vital current interest, among which was that of the training of technical chemists. Referring to the utilisation of coal tar for the production of drugs, perfumes, and colouring matter, an industry originated in England, but now most successfully followed in Germany, Prof. Dewar explained our want of success as follows:—

"It is in the want of education among our so-called educated classes, and secondarily among the workmen on whom these depend. It is in the abundance of men of ordinary plodding ability, thoroughly trained and methodically directed, that Germany at present has so commanding an advantage. It is the failure of our schools to turn out, and of our manufacturers to demand, men of this kind, which explains our loss of some valuable industries and our precarious hold upon others. Let no one imagine for a moment that this deficiency can be remedied by any amount of that technical training which is now the fashionable nostrum. It is an excellent thing, no doubt, but it must rest upon a foundation of general training. Mental habits are formed for good or evil long before men go to the technical schools. We have to begin at the beginning: we have to train the population from the first to think correctly and logically, to deal at first hand with facts, and to evolve, each one for himself, the solution of a problem put before him, instead of learning by rote the solution given by somebody else. There are plenty of chemists turned out, even by our universities, who would be of no use to Bayer & Co.' They are chockfull of formulæ, they can recite theories, and they know textbooks by heart; but put them to solve a new problem, freshly arisen in the laboratory, and you will find that their learning is all dead. It has not become a vital part of their mental equipment, and they are floored by the first emergence of the unexpected. The men who escape this mental barrenness are men who were somehow or other taught to think long before they went to the university. To my mind, the really appalling thing is not that the Germans have seized this or the other industry, or even that they may have seized upon a dozen industries. It is that the German population has reached a point of general training and specialised equipment which it will take us two generations of hard and intelligently directed educational work to attain. It is that Germany possesses a national weapon of precision which must give her an enormous initial advantage in any and every contest depending upon disciplined and methodised intellect."

Progress of Geographical Education.

In concluding his address to the Geographical section the President, Colonel Sir T. H. Holdich, spoke in the following terms of recent attempts to improve the teaching of geography in our schools:—

"The progress of geographical education in the country,

although it is by no means so universally apparent as might be considered desirable, yet shows encouraging symptoms of vitality in many directions. The Civil School at Oxford, for instance, conducted by Mr. Mackinder, has already made most successful efforts to produce expert teachers of geography. Here, in addition to 163 undergraduates attending courses during the past year, five students have already won the Post-graduate Diploma granted by the University, and it is encouraging to note that four out of the five have already obtained distinctively geographical work. Others similarly qualified, if of sufficient ability, would probably not have long to wait for opportunities. In addition to its regular University functions, the Oxford school has this year organised a summer course of three weeks' study. This has been well attended by teachers and instructors from all parts of the country, and even from America. In London a department of economic geography is in course of organisation at the School of Economics and Political Science, and geography will become a compulsory subject in examinations. In the matter of examinations we have to chronicle the issue of a most excellent syllabus for the new London Matriculation, which should ultimately have great influence on the teaching in many schools. Further, the Geographical Association, a body now of several hundred teachers, has made great progress. It has recently commenced the issue of a journal known as the *Geographical Teacher*, one of whose functions appears to be the criticism of the questions set in various public examinations. In the University of Cambridge the interests of geography are doubtless not overlooked, but they are not conspicuously *en evidence*, and I have no trustworthy data of the progress made in their maintenance. In military schools the report of the late Committee appointed to consider the education of Army officers shows clearly enough that, amongst all the necessary subjects for a cadet's education which have to be crammed into the exceedingly short course of his military schooling, that branch of geography which is embraced by the term 'military topography' finds a very conspicuous place. The short course of a military school will never turn out an accomplished geographical surveyor; nor does it in any way outflank the necessity for a military school for professional topographers. But it teaches the young officer how maps are made, and instructs him in the use of topographical symbols. It would be well if it could be pushed a little further—if it could teach him how to make use of the maps when they are made—for personal experience convinces me that the apathy shown by many of our foremost generals and leaders on the subject of maps arises chiefly from a well-founded doubt of their own ability to make use of them."

What is Technical Education?

Towards the end of his address to the Engineering section, the President, Prof. Perry, thus defined the meaning of technical education:—"In Germany and France, and to a less extent in America, there is among employers a belief in the value of technical education. In England there is still complete unbelief. I have known the subscribers of money to a large technical college in England (the members of its governing board), to laugh, all of them, at the idea that the college could be of any possible benefit to the industries of the town. They subscribed because just then there was a craze for technical education due to a recent panic. They were ignorant masters of works (sons of the men who had created the works), ignorant administrators of the college affairs, and ignorant critics of their mismanaged college. I feel sure that, if the true meaning of technical education were understood, it would commend itself to Englishmen. Technical education is an education in the scientific and artistic principles which govern the ordinary operations in any industry. It is neither a science, nor an art, nor the

¹ A German firm employing 5,000 workmen, 160 chemists, 260 engineers and mechanics, and 680 clerks.

teaching of a handicraft. It is that without which a master is an unskilled master, a foreman an unskilled foreman, a workman an unskilled workman, and a clerk or farmer an unskilled clerk or farmer. The cry for technical education is simply a protest against the existence of unskilled labour of all kinds."

NATURE NOTES FOR OCTOBER.

By the REV. CANON STEWARD, M.A.(OXON.)
Principal of Salisbury Training College.

Birds.—Autumn migration is in full force. Rare birds may occasionally be observed. Hawks on their passage to southern Europe are caught by falconers in Holland with the aid of the Shrike. Swallows and House Martins all leave us, as well as the Corn Crake and Sandpiper. Woodcock and Snipe arrive, the former generally in lean condition. Ospreys visit harbours on the sea coast. Shorthorned Owls may be flushed on the downs and in turnip fields. Fieldfares with harsh clattering note arrive from Norway, as does the Redwing, often mistaken for the Song Thrush. Siskins and the Lesser Redpoll occasionally visit us. The Brown Owl hoots on clear autumn evenings. The Missel Thrush is now in fine voice, and the young birds of the Song Thrush and Blackbird begin their education, and sometimes the Chaffinch and Greenfinch may be heard singing.

Butterflies and Moths.—The Death's Head Moth may be taken this month, and the larva of the Hornet Clearwing (*Egeria*) found on the trunks of willows. Otherwise but few moths may be seen. These are: *Noctua*, *Exoleta*, *Lambda*, *Seladonia*, *Aprilina*, and *Præcox*; *Geometra*, *prospariaria*, *defoliaria*, *pennaria*, *psittacata*, and *spartiata*. Entomologists will continue to search for chrysalids or pupæ in the ground at the base of the trunks of the poplar, oak, willow, &c., to be hatched out in the rearing boxes, by which means the best specimens may be obtained.

Plant Life.—Botanists may study Fungi, as Puff-balls, Birdsnest, Yellow Tremella, Black Bulgaria, Purple Clavaria, Orange Stereum and Crimson Agaric. Some of these form tempting subjects for advanced brush-work. Truffles are sought for in beech groves by trained dogs. Among the few plants in flower are *Ulex nanus*, Ivy, Saffron Crocus, Corn Wound Wort, Arbutus, Bitter Persicaria, White Horehound, Woodsage, Tall Red Mint. Hedgerows are red with the fruit of the Spindlewood and Mountain Ash, and with the leaves of the Corvel or Dogwood. Old Man's Beard straggles over the bushes.

A more thorough study of the various methods of seed dispersion may be made, and the drawings in the note-book completed. These are:

- (1) The winged fruits or seeds, as of the ash, maple, sycamore, pine, and larch.
- (2) The hairy fruits or seeds of dandelion, thistle, and willow herb.
- (3) The hooked fruits or seeds of the burdock, cleavers, agrimony, &c.
- (4) The explosive fruits, as of the herb Robert, broom, wild pansy, and *noli me tangere*.

Microscope work can be done in the long evenings.

Folk-lore :—

By the 1st of March the crows begin to search,
By the 1st of April they are sitting still,
By the 1st of May they are flown away,
Creepin' greedy back again with October wind and rain.
A good October and a good blast,
To blow the hog acorn and mast.

ITEMS OF INTEREST.

GENERAL.

THE Modern Language Association recently petitioned the Secretary of State for War not to abolish the teaching of modern languages at Woolwich and Sandhurst, as has been recommended by the Committee on the Reform of the Education of Officers. Though the Committee acknowledged, however, the importance of modern languages for an officer by making one compulsory in the Entrance Examination, and recommending that extra daily pay be granted to every officer who qualifies as an interpreter. We understand that the new Commandant of Sandhurst, Colonel Kitson, has decided that the teaching of French and German shall continue until Christmas. The War Office is expected to determine early in October what is to be done next year.

MENTION has already been made of the coming departure of Mr. P. A. Barnett to an important educational post in South Africa. He sails in the middle of October for Natal, where he is to act for two years as Director of Public Instruction. Large numbers of teachers and others interested in education will join us in good wishes for the success of his work. He will be specially missed in the Training Colleges, the work of which during the last thirteen years has been influenced in no small degree by his leadership and inspiration, first as Principal of the Borough Road College from 1889—1893, and afterwards as H.M. Inspector. It is satisfactory to know that Mr. Barnett's absence is only to be temporary. He does not quit the service of the Board of Education, but is "seconded" in view of a speedy return. It is no exaggeration to say that English education cannot afford to spare him.

THE Technical Education Board of the London County Council recently appointed a sub-committee to report upon the "application of science to industry." The committee examined a number of leading men of science and employers in various industries, and has published a valuable report, in which the following conclusions are to be found :—(1) That England (and London in particular) has suffered the loss of certain industries, and that others are in danger; (2) that this loss has been largely due to defective education, especially in the higher grades; and (3) that London is still seriously behind other cities, notably Berlin, in the provision for the higher grades of scientific training and research. Our chief deficiency is the want of highly-trained men of science capable of undertaking research work, and, as the last "special report" prepared under Mr. Sadler's guidance shows, this is the very direction in which the United States are showing great activity just now. It is clear that, if we are to compete commercially with Germany and America on anything like equal terms, we must indeed "wake up." Whatever direction the effort to equalise matters may take, it must not be forgotten that it is worse than useless to attempt to specialise without having a sound foundation of a thorough general secondary education.

IN an article in our issue for February of this year (p. 55) attention was directed to a comparison instituted by the Council of the Association of Technical Institutions between the number of students of fifteen years old and upwards taking complete day technological courses of not less than twenty hours a week in all the technical institutions throughout Great Britain and Ireland, and the number of students over eighteen attending full day-courses in the technical high schools of the German Empire. His Excellency the German Ambassador has kindly

supplied the Council of the Association of Technical Institutions with additional statistics in regard to German technical high schools. We find that the total number of German students of the age mentioned attending day courses in the different branches of technology is 15,442, and that of these 935 have attended for more than four years. In Great Britain and Ireland, even counting students of fifteen and upwards, the total only reaches 3,873, and only 113 of these have attended for so long a time as three years.

A RECENT parliamentary return tabulates the sums applied by local authorities to the purposes of technical education. It shows that the total amount expended in this direction in England and Wales during 1900-1 was £1,051,422, and this does not include sums allocated to intermediate education under the Welsh Intermediate Education Act. The total sum derivable from the "whisky" money during the same year under the Local Taxation (Customs and Excise) Act, and available for technical education, was £924,360, but £60,513 of it was devoted to the relief of rates. It is, however, satisfactory to learn that forty of the forty-nine county councils included in the return devote the whole of the money they receive from this source to education.

THERE has recently been a marked advance in the extent and quality of the work of evening continuation schools in Cornwall. During the past session the number of students increased by over twenty per cent. The influence of the central technical school at Truro has been very great; the lectures given by members of its staff in outlying districts especially have done much to stimulate interest. The mining schools of Camborne and Redruth continue to prepare students to take a useful part in the mining industries of the county, while the fisheries and agricultural pursuits are both served by systematic teaching.

A SHORT time ago the Zwickau Chamber of Commerce wrote to all the various chambers of commerce in the German Empire to ascertain the sum expended by them in supporting commercial education, and the supervision exercised on schools in their respective localities. The replies from 145 chambers of commerce show that no less than 112 are actively engaged in promoting commercial education. Of the remainder many have been but recently established, or commercial education in their districts is maintained by the merchant unions or by municipal governments.

At the recent Trade Union Congress in London the Education Bill gave rise to a long discussion. A resolution was carried almost unanimously which condemned the Bill "because it does away with the principle of direct representation; will increase sectarian jealousy; repeals the Acts which stand alone in giving statutory recognition to the need for manual instruction in the application of special branches of science and art to specific industries and employments; and will prevent women educationists from being elected upon education committees." The Congress followed up this expression of opinion with several recommendations, such as "it is essential that all grades of education should, in districts of suitable size, be under one local authority, directly elected, and elected solely for educational purposes"; "that no fees be charged in any of the elementary, evening continuation, higher-grade, or technical schools, and that all grants to any of these schools recently withdrawn or reduced be re-established"; "that the obstacles to the continuance of free and properly-equipped evening schools be abolished"; "that there be adequate provision of training-colleges for teachers, such colleges to be free from sectarian bias or control."

THE September reviews contain a number of essays dealing with educational subjects. In addition to an editorial article on "Public Schools and their Critics," *The Monthly Review* contains a continuation of Mr. Julian S. Corbett's consideration of "Education in the Navy." There are two contributions to the education controversy in the *Fortnightly Review*. His Honour Judge Bompas writes on "The Education Bill," and the Rev. J. Gregory Smith on "Educational Prejudices." Prof. Armstrong, in the *National Review*, complains of "The Need of General Culture at Oxford and Cambridge." The *Nineteenth Century and After* also has two educational articles, one "Education in Egypt," by Mr. R. Fitzroy Bell, and the other "'Reasonableness' and the Education Bill," by Mr. A. W. Gattie. The *Empire Review* leaves the general subject for a part of it of more particular interest to teachers, in the article by Mr. M. A. Gerothwohl on "The Teaching of History and Geography." Who will say, in the face of this imposing array, that English people are uninterested in educational topics?

THE September number of the *Cornhill Magazine* contains the first of a series of articles dealing with the professions from the point of view of a parent who wishes to launch his sons on the world, but who is ignorant both as to the necessary preliminaries and the reasonable prospects in the various careers which are open nowadays to young men. Whether it be the Army, the Navy, or what not, a man whose own experience and connections lie in other walks of life is inevitably at sea on a thousand-and-one points. He wants to know, in the first place, what is the sort of training best adapted, where it is to be obtained, and what it ought to cost. Judging from the article on "The Royal Navy" before us, the anxious parent cannot do better than purchase the *Cornhill*, month by month, so long as this series lasts. The articles are all to be anonymous, but it is quite clear from the opening paper that the writers have a practical, working acquaintance with the details of the professions of which they treat.

THE September number of the *Empire Review* contains an interesting article by Mr. Maurice A. Gerothwohl on the "Teaching of History and Geography." "History and geography are," the author says, "the most neglected subjects in the routine of a secondary school. The scanty hours nominally devoted to their study are, if not evaded, at least rendered ineffective by dull and misguided reading of insipid, antiquated, and prejudiced text-books, occasionally varied with the parrot recitation of facts and dates." It is maintained in the course of the article that "within the five or six years which form the usual secondary course the pupils should have been taken through the general evolution of mankind from the earliest days to our own. Each year should be devoted to a distinct period of the world's history, and a certain portion in the first term in every year to a compendious revision of the work of the preceding years, thus ensuring the constant comprehension *in globo* of the unbroken chain." Teachers of history and geography would do well to study Mr. Gerothwohl's essay.

WE have received the first number of *Indian Education*, edited by Mr. J. Nelson Fraser, and published in Bombay by Messrs. Longmans, Green and Co. The new monthly record is intended to deal with all fields of educational work in India—vernacular, university, artistic, and industrial. Judging from the first number of our contemporary, we should say that Indian teachers will find it both useful and interesting. Dealing as it does with education in Europe and America in a concise and correct manner, subscribers to it will not only be kept informed as to what is happening in the schools of India, but also learn the most important educational events throughout the world.

We learn from the *Pioneer Mail* of Allahabad that the report of the Indian Universities Commission has been published. From the fifty pages of recommendations which the report contains reference can only be made to one or two. It is recommended that there shall be no more than five Faculties: Arts, Science, Law, Medicine, and Engineering. It is maintained that it is unnecessary to establish a Faculty of Teaching, which may come under the Faculty of Arts. It is urged that fees should not be so high as to check the spread of education, nor so low as to tempt poor boys unfit for higher instruction. State scholarships would provide openings for really deserving poor boys. The Commissioners think that the Universities should recognise no school not recognised by the Education Department, excepting well conducted schools in adjoining native states. Among the paragraphs relating to teaching, it is recommended that the use of keys which present skeletons of text-books, prepared for easy committal to memory, should be discouraged; that no text-books in English should be prescribed, but the text-books to be read should be so long as to exclude the possibility of all of them being committed to memory. Books criticising literary works which students have not read should be excluded. Two of the later recommendations will strike many persons in this country as strange, viz., "no private student should be admitted to the higher examinations," and "the conduct of the school final examination should be regarded as outside the function of the University."

SCOTTISH.

SIR HENRY CRAIK, in his annual report on Secondary Education in Scotland, just issued as a blue book, states that 94 higher-class schools were inspected this year. Of these 32 were under the management of school boards, 27 were endowed schools, and 37 were under private management. The report emphasises the necessity for increased attention to the pronunciation of modern languages. In many instances it has been found that the only method of teaching this important side of modern-language study is by a haphazard imitation of indifferent models. The systematic study of the phonetics of the language has rarely been attempted, and until that is done little improvement in pronunciation can be expected.

SIR HENRY this year again makes an appeal to employers to second the efforts of the Department to raise the general level of education. He admits that for some time past there has been a growing dissatisfaction in Scotland regarding the defective education of youths entering upon a mercantile career. The remedy for this, he plainly tells employers, lies in their own hands. The educational machinery of the country can never have a fair chance until merchants as a body set their faces against the practice of taking boys into business at 13 or 14, and until, in their selection of apprentices, they give preference and reasonable encouragement to those who can produce evidence of having profited by their school training.

THERE appears in this blue book, for the first time, a report on foreign languages by the assistant-director of higher inspection. It states that, in the largest of Scottish centres of population, a fair proportion of secondary schools ought to make it their main business to supply a "thorough education" through the medium of modern languages, and the so-called "modern side" of many schools he regards only as a *pis aller*. But he surely forgets that the whole trend of the recent action of his own Department has been in the direction of still further lowering the position of

modern languages, and of branding by implication the course of study in which they occur as "unsatisfactory and unthorough."

AN official intimation appears in the *Gazette* stating that the King has been pleased to grant a Royal Charter to the Carnegie Trust.

THE examinations for leaving certificates and intermediate certificates, conducted by the Scotch Education Department, have now been completed. Candidates were presented from 190 higher-class and state-aided schools, and 364 leaving certificates and 605 intermediate certificates have been awarded as the result of these examinations. The most notable feature in the results this year is the extraordinary decline in the number of honours certificates in French and German. However severely this may bear on individual teachers, the true friends of modern languages must rejoice at this marked raising of the standard which will give to honours certificates in modern languages as great a value as have all along pertained to those in English, classics and mathematics. No one could hitherto make such a claim on their behalf.

THE Royal Commission on Physical Training (Scotland), presided over by the Earl of Mansfield, held twenty sittings and examined seventy-seven witnesses during the months of May and June. No representatives of the Press have hitherto been admitted to the proceedings, but it is understood that during the sittings which are to be held in October and November, in the leading towns of Scotland, full reports of the proceedings will be issued daily. It is rather unfortunate that the Commission has come under the suspicion of being tinged with militarism, and of having a mandate to formulate a scheme converting the national schools into embryonic barracks. The strict secrecy which veiled all the sittings of the Commission naturally tended to strengthen this suspicion, but a calm review of the evidence taken completely dissipates such a view, which has been disavowed by almost every one of the Commissioners.

THE enquiries of the Commissioners are directed to the provision of physical training partly in elementary schools for children under 14, partly for older boys and girls up to 18 in continuation schools or otherwise. The evidence taken so far shows a general agreement in favour of more physical drill being given than at present, of it being compulsory and systematic, and of some more definite system of inspecting, registering and classifying the health and physical condition of the children, with a view to ascertaining and tabulating the effect of physical exercise upon health. This latter recommendation seems a most necessary one, in view of the results of the German experts in mental fatigue, who place gymnastics with geometry as easy firsts in the table of mind strains. As to the application of the general principles fairly unanimously entertained, there is a wide diversity of opinion. Military exercises, Swedish drill, and organised games have each their enthusiastic supporters. It is to be hoped that no hard and fast schemes will be drawn up by the Commissioners, but that liberty will be allowed to combine in judicious measure all three as essential elements in a sound physical training.

IRISH.

THE results of the Intermediate examinations held last June were sent to the managers of the various schools concerned on September 1st. The publication of a results' pamphlet containing the marks of every pupil examined has this year been abandoned. This is a new departure, one immediate outcome of which is that no comparison can at present be made be-

tween different schools, nor can any criticisms be offered with certainty on the results as a whole. The Intermediate Board of course may and should make good the deficiency as far as possible by giving a summary of the results in the various subjects in the different grades. With these reservations, may we add that the results in Greek seem to justify our opinion, given in these columns in the August number, that the papers in that subject were too difficult, and that in the Preparatory Grade generally there has been a larger mortality of failures than is consistent with a sound system?

THE results as forwarded to the managers are given in a somewhat complicated manner. The full marks for each paper both pass and honour were 400. In the case of candidates who passed on a pass paper in any subject the gross marks obtained are given; in the case of those who passed on honour papers 100 marks are subtracted from the total marks in Greek and German and 120 marks in other subjects, *i.e.*, only the marks above the pass standard on the honour papers are given; while in English composition, again, the marks are recorded only when over fifty per cent. The results also include the result of the inspection held in the spring by the Department of Agriculture and Technical Instruction in the subject of Experimental Science and Drawing. As there were no marks in this subject, only pass or failure is indicated. Would it not be simpler or better to give the marks throughout in full?

THERE is one rule of the Department which is likely to cause a great deal of inconvenience and difficulty, especially in the smaller schools. And are not most of the Irish schools small? A large number of candidates who have failed in the Preparatory Grade as a whole have yet passed in Experimental Science and Drawing. Others who have not failed would, in the opinion of their teachers, benefit by taking the same course again, especially as many passed who had not completed the first year's course. The Department's rule, however, is that all candidates who have passed in the first year's course must proceed to that for the second year. The attention of the Department was called to this point early in the summer, but apparently the point has not been appreciated.

THE Rathkeale Board of Guardians has called attention to a difficult point in the organisation of technical education in the rural districts, which should not, however, be beyond the power of the Department to solve. The fear is that in framing schemes of technical instruction provision may be made for the towns and the rural districts forgotten, in which case there will be no remedy provided against emigration from the country. Why should not itinerant instructors be provided to give regular instruction in different villages?

THE Rathmines School of Commerce has published its prospectus, and its classes open on Monday, September 29th, all work being done in the evenings. It will be the only school of its kind at present in Ireland, and is intended to supply technical instruction in commercial pursuits. There will be junior and senior classes with special courses of lectures. The junior classes are roughly for junior clerks, and include instruction in shorthand, typewriting, commercial arithmetic, book-keeping and English correspondence; the senior classes are intended for those in more responsible positions, and will make a special point of modern languages, particularly with a view to their practical use in speaking and in correspondence. Special courses of lectures will also be occasionally given on such subjects as banking and business credit, insurance, finance and taxation as affecting trade, trusts and combinations, trade unions, the organisation of offices and factories, &c. The com-

mittee seem especially anxious to impress on the public that they are not going to compete with other similar private enterprises. It will probably not compete with ordinary day-schools, but if it teaches shorthand, for example, will it not compete with other places where shorthand is taught in the evenings? But the School of Commerce supplies a want and should be a success.

IN Belfast they are also alive to the needs of commercial education. Dr. Hamilton, the President, in his report on the Queen's College, Belfast, states that it is proposed to found in the college a Faculty of Commerce. £1,000 has already been promised for it, and a scheme drawn up by the Belfast Chamber of Commerce in consultation with the heads of the Queen's College, proposing the institution of a diploma and a degree in commerce. A site has also been given by the Right Hon. W. J. Pirrie for a Pirrie Laboratory, which will include departments for physical, optical and engineering science.

THE Intermediate Board has published some modifications of the set authors in English for the current year. In the Senior Grade it is explained that Shelley's "Ode to the Nightingale" ought to be "The Woodman and the Nightingale." In the Middle Grade either Lytton's "Harold" or Wiseman's "Fabiola" may be taken as an alternative to Thackeray's "Esmond"; in the Junior Grade Scott's "Talisman" is given as an alternative to "The Fortunes of Nigel," and "Measure for Measure" is to be omitted from Lamb's "Tales from Shakespeare."

WELSH.

THE subjects in which county governing bodies of the Intermediate schools have to interest themselves are very varied. The following are some of the points raised at a meeting of the Denbighshire County Governors. In the discussion on the syllabus for entrance scholarships to the county schools in 1903, it was urged that modern educationists had brought about a reaction against the time-honoured drill in parsing, and analysis and parsing were made alternatives. The establishment of a mining school at the University College, Bangor, was next considered, and the claims upon Denbighshire to contribute a due quota from the funds for technical instruction were admitted and embodied in a resolution. Then came applications for increased grants from Abergele, Denbigh, Llangollen and Wrexham county schools. A teachers' pension scheme was then considered, but unfortunately decision was again deferred. The teaching of modern languages came on for discussion. The county governing bodies are thus quickly becoming county educational parliaments.

IN the meantime, a newspaper correspondent declares that the success of the county schools is hampered by the unsatisfactory condition of primary schools in Wales. For this position facts can be brought forward which should indeed give pause to Welsh enthusiasts. Here are two facts which have been mentioned: (1) The attendance in Primary Schools. In Wales the county average is 77.4, English 82.6. The attendance average in Denbighshire is 75.4. (2) The staffing of the schools. We are told that the average number of children for every certificated teacher under the London School Board is 45. The average for Welsh counties is 101; for Denbighshire, 107. There can be no doubt that the staffing of the primary schools is matter for urgent consideration in Wales. With a single authority for primary and secondary schools, this is bound to claim early attention.

THE cry is arising that there is not a satisfactory number of candidates for entrance scholarships into the county schools. At Denbigh, it is reported, only five boys sat, and of these only two obtained the minimum number of marks for a scholarship. At Ruthin County School for Girls, a school so successful that an extension of the school-buildings is contemplated, it was recently reported that only 13 candidates sat for 17 scholarships. The highest candidate obtained 340 marks out of a maximum of 600. It is, however, manifestly unreasonable to throw the blame on the elementary schools. It is a comparatively new demand to require the elementary schoolmaster to prepare for these competitive entrance scholarship examinations, and the conditions under which this work has to be done require re-consideration.

THE 1901 census returns have been published for Wales. The following shows the relation of the English and Welsh-speaking population. The minimum age adopted in the 1891 report was two years, and in 1901, three years :—

Languages spoken.	Proportion per cent.	
	1891. Age 2 years and upwards.	1901. Age 3 years and upwards.
English only ...	49·8	55·9
Welsh only ...	21·8	6·6
Both English and Welsh ...	27·2	36·9
Other languages ...	0·4	0·4
No statement ...	0·8	0·2

NOTICE has been given of a motion in the Carmarthenshire County Council "that unless the Education Bill provides for satisfactory public control over rate-aided schools, the Council will refuse to carry out the provisions of the Bill."

THE North Wales Calvinistic Methodist Association, representing 170,000 adherents, has resolved "unanimously" that the least that would be satisfactory in their view in the management of the schools would be a Board made up of one-third of the trustees, one-third appointed by parents, and one-third by the local education authority. Unless this and other concessions are made, "serious and determined opposition would not fail to arise, which would seriously impair the cause of education, and Wales will not rest satisfied until these unjust proposals of the Bill are removed."

CURRENT HISTORY.

WHEN the King of Italy recently visited the German Emperor, William II. made another of those speeches which mean so much, specially to those of us who can see their historical significance. In proposing the toast of his guest, he said: "Welcome to your Majesty as the King of that magnificent and beautiful Italy, *land of our dreams*, source of the inspiration of our artists and poets." He might have added "of our uncivilised forefathers and of our mediæval Emperors." To say nothing of the invasions of Italy from the north, the story of which Dr. Hodgkin has told again for our generation, what memories crowd round the four words we have italicised. From the coronation in 800 of Karl the Great as Emperor, till Italy achieved her unity against her Austrian oppressor in the last century, the destinies of Germany and Italy were inextricably mingled to the confusion of both. The mediæval King of Germany claimed to be Emperor, but could not be fully so regarded till he was crowned in Rome by the Pope. To attain this shadowy dignity what history was made! We think of

Otho III. and his dreams, of Frederick I.—the "Barbarossa" of his Italian subjects—of Frederick II.—*Stupor Mundi*—of Henry VII. and Dante—and of the long conflict for Italy between France and Germany. But to tell all the story would be to tell the history of Europe. What does William II. mean when he still speaks of Italy as the land of German dreams?

OUR readers have doubtless read in their newspapers, even though it has been vacation with most of us, some account of the meetings of the Colonial Premiers with the Colonial Secretary. We draw attention to them again to point out that they form a stage in the history of the British Constitution. The English Parliament itself began in the middle ages with no more noise and attracted less attention from the chroniclers of the time than this new development. (We are assuming, of course, that our readers know that neither Simon de Montfort nor any one else *founded* the House of Commons.) This is now the second instance at least of such a gathering, and we all know that "twice" establishes a precedent in English law. At least John Hampden knew that when he refused to pay the famous thirty shillings. It was five years ago, in the year of the Diamond Jubilee, that the Colonial Premiers met last, and this accidental interval is already prescribing the periodicity of the new Imperial Parliament. It is suggested that it should meet every four or five years, just the interval that, on the average, separated the meetings of Parliament in the days of "Good Queen Bess," the period at which we may date the commencement of our modern constitution. And finally, this Parliament (=talking thing) is like the States-General of the old United Provinces of the Netherlands, for they are but deputies and can decide matters only *ad referendum*. They must consult their constituents. How long will they remain at this stage?

ONE day last July some twenty Bengal Lancers visited the Houses of Parliament, and happened to be in the lobby of the Commons just as the Speaker was entering with the mace. The daily papers recording the incident state that "Mr. Gully was obviously taken aback by such an unwonted reception." May we be allowed to speculate, not perhaps too seriously for once, on the thoughts that rapidly passed through the Speaker's mind? Did he think, we wonder, of January 4th, 1641-2, when armed men thronged the lobby and Charles I. paid the only visit that ever King of England has paid to the floor of the House of Commons? Or were his thoughts occupied with the events of April 20th, 1653, when the soldiers that waited in the lobby actually entered the House and put a forcible end to its sittings for seven years? Or, being a lawyer, did he mentally repeat to himself "that the raising or keeping a standing army within the kingdom in time of peace, unless it be with consent of Parliament, is against law?" To his predecessors of the seventeenth century the January and April days were real memories, and the clauses of the Bill of Rights seemed real securities against the possibility of their recurrence. But though the loyalty of the Bengalese is probably far more to the Crown than to the House of Commons, Mr. Gully's fright was surely only momentary.

IT is difficult for those of us whose information on current events is derived solely from the newspapers to know what is going on in China. Much more is it for us to discover the tendency of things in that large country. Whether China is gradually waking up and is about to become "civilised" according to western ideas, or whether we are on the eve of another anti-foreign rising, it seems impossible to tell. But, subject to this inevitable uncertainty, it seems that, under the terms of the newest treaty, one between Great Britain and China, the taxes known as *li-kin* are to be abolished, and all

that imported goods will have to pay henceforth will be paid once for all at the seaport. What the origin of *li-kin* is, whether it is only a recent introduction, or whether it dates back to an antiquity which may be "immemorial," we cannot say, but the abolition reminds us of the French Revolution. In France, under the *ancien régime*, goods paid taxes at many an inland frontier, relic of the feudal times when, properly speaking, there was no "France," but only provinces, Burgundy, Brittany, Languedoc, &c. But when there arose the Republic "one and indivisible," and the government of France was centralised in Paris, these barriers were swept away. Will the abolition of *li-kin* lead to the unity of China? Will united China be strong to the point of aggression?

RECENT SCHOOL BOOKS AND APPARATUS.

Modern Languages.

Erickmann-Chatrion, Madame Thérèse. Edited by A. R. Ropes. xvi. + 227 pp. (Cambridge University Press.) 3s.—Mr. Ropes was happily inspired when he determined to edit this excellent story, which will interest boys and girls alike, even more than the two tales by Erickmann-Chatrion which he has already edited for the Pitt Press, viz., "Le Blocus" and "Waterloo." The text is rather long (168 pp.), but it can be read in a term, if the pupils are encouraged to take some of it cursorily. The notes on the subject-matter are as good as could be desired, and the grammatical notes are agreeably free from technical terms. In some cases German words are not given correctly (e.g., Innsbrück, Kreutzer, Schnapps, Drück).

Blackie's Little French Classics. (1) *Chateaubriand, Selections from Les Martyrs.* Edited by E. T. Schoedelin. 40 pp. (2) *Cornéille, Selections from Le Cid.* Edited by Louis A. Barbé. 40 pp. (3) *La Fontaine, Select Fables.* Edited by A. H. Wall. 32 pp. (4) *Musset, Selections in Verse and Prose.* Edited by F. W. B. Smart. 32 pp. (5) *Racine, Les Plaideurs.* Edited by D. Lowe Turnbull. 48 pp. (Blackie.) 4d. each.—This cheap but well-printed and well-edited series is evidently becoming popular, for it is growing rapidly. The five volumes before us are very satisfactory pieces of work, and may be recommended particularly to the lecturer on French literature, as convenient for his audience. The selections from "Les Martyrs" are welcome, as they give a fair idea of a remarkable book not often found in libraries. The selections from La Fontaine and Musset are happy; another eight pages might be added to each with advantage. We question the advisability of selections from "Le Cid," which should be read without "cuts"; however, the editorial matter of this volume is excellent. The edition of "Les Plaideurs" is the least satisfactory; nor was there any need for a further edition. To recommend it for its "purity of diction" and as "an excellent medium for exhibition purposes" is quaint.

J. de Glouvet, France de Montorel. Edited by F. B. Kirkman. xi. + 83 + xxxv. pp. (Black.) 1s. 6d.; without vocabulary and English notes, 1s. 3d.—Mr. Kirkman is busily and judiciously adding to his series of illustrated reading-books. The latest volume he has edited himself, and we can recommend it warmly. The narration is full of adventure, the helps afforded by the notes are just what the pupils require; and incidentally they will learn something about the period of history which lies between the battle of Agincourt and the advent of the Maid of Orleans. This will be of all the more value as the events are

presented from the French point of view, and illustrated by exceptionally good reproductions of old engravings, coins, &c. The book is carefully printed; we have noted only a few slips. The statement on p. 57 (note 1) does not agree with that on p. 83 (l. 6); and *voilà* was not originally an imperative (note on p. 13). The vocabulary is practically complete.

Jeanne Mairé, La Tâche du Petit Pierre. Edited by O. B. Super. 134 pp. (Heath.) 1s. 3d.—This pretty story has been somewhat shortened so as to take up only 80 pages of text; and it is illustrated by three full-page pictures. A few pages of notes are added, and a vocabulary, which seems to be complete. The exercises for re-translation will be welcome to many teachers.

A First Book of "Free Composition" in French. By J. E. Mansion, B.ès-L. xiii. + 64 pp. (Blackwood.) 1s.—The importance of suitable exercises in "free composition" is gradually being recognised, the translation of English passages into another language being too difficult a task for young pupils who have as yet no conception of style, as Mr. Mansion rightly remarks. He has been encouraged to write this capital little book by the fact that the Scotch Education Department has recently introduced this "free composition" into the Leaving Certificate papers in Modern Languages. The book is compiled with great care, and admirably graduated; we recommend it warmly to all teachers of French, and trust that it will have a wide circulation.

Molière, Les Fâcheux. Edited by E. J. Trechmann, M.A., Ph.D. 86 pp. (Clarendon Press.) 2s.—We can recommend this edition of Molière's amusing *comédie ballet*, which is well suited for reading in the upper forms of our schools. The history of the play is sketched in the introduction, and La Fontaine's description of the *Fête, donnée à Vaux* is given in full. The notes are distinctly good; a little more attention might, however, have been given to questions of prosody.

Français pour les tout petits. Scenes from child-life in France. By Jetta S. Wolff. viii. + 96 pp. (Arnold.) 1s. 3d.—Miss Wolff is already favourably known by her little volumes of French life entitled "Les Français en Ménage" and "Les Français en Voyage." The present "scenes," meant for younger readers, are written with the same lightness and sense of humour and deserve to be compared with Mrs. Frazer's charming books, except that the illustrations are much inferior, some (e.g., that on p. 24) being ludicrously bad. It must not be thought that this is a "first book," for it assumes a fair knowledge of French words, but it will do very well as a supplement to the chief book in use. The subject-matter makes it more suitable for girls than boys. The notes are adequate, but it was a mistake not to number the lines of the text and thus indicate the place of the words annotated. The vocabulary is practically complete; in a second edition it would be well to consider the advisability of giving not only the infinitive of irregular verbs, but also forms like *irai, veut, va*, which occur in the text,

Alexandre Dumas, Napoléon. Edited by W. W. Vaughan, M.A. lx. + 156 pp. (Macmillan.) 2s.—The historical introduction to this volume is excellent. The text itself describes the life of Napoleon from the time when he was "King of the Isle of Elba." The very brief account of Waterloo is, however, taken from Léon Meyniel, because of the numerous inaccuracies in Dumas' description of the battle. The notes are good, but rather too copious, and considerable care has been devoted to the vocabulary and the appendices, a key to which has been published.

Little French Folk. By C. V. Onions, M.A. 101 pp. (The Norland Press; Simpkin Marshall.) 2s. net.—This is a

charming book—with only one blemish: the four pages “to teachers.” Fortunately, they can easily be detached. Not that there is much to find fault with in this preface: Mr. Onions writes sensibly and well, even on the pronunciation. Indeed, the hints to teachers might well be expanded; but they should be issued separately—not as a part of the child’s book. The text is quite simple and well suited for children; it is rendered still more attractive by Mr. Williamson’s really excellent illustrations. It seems ungracious to find fault, as the feeling in them is no less admirable than the drawing; but would it not have been better to make them characteristically French? Nothing could be more English than *le Berger* on page 53 or the *commissionnaire* on page 41. We heartily recommend this as a delightful book for little English folk.

French Songs and Verses. Arranged and edited by A. L. Middleton, B.A. 29 pp. (Sonnenschein.) 1s.—This convenient selection consists of eighteen songs, with ordinary and sol-fa notation and piano accompaniment; and twenty-one poems. Among the former we see some of the old favourites, such as “Au clair de la lune,” “Ma Normandie,” and some which have the merit of novelty, such as Mr. Middleton’s setting of Lafontaine’s “Rat de ville.” Several are by the distinguished “reform” teacher, Dr. Max Walter. The poems are somewhat mixed; we have nursery rimes, fables, Victor Hugo’s “La Charité” and Béranger’s “oleograph,” the “Adieux de Marie Stuart.” This book, which is well printed, should find a sale all the more readily as it is free from notes or other ballast.

The Plays of Molière. With a new translation and notes by A. R. Waller. *Tartuffe, or the Hypocrite. Don Juan, or the Feast with the Statue. Love’s the Best Doctor.* 336 pp. (Grant Richards.) 3s. net.—To render Molière’s Alexandrines in natural, easily flowing, English prose is well-nigh impossible; a poetic version is conceivable. Mr. Waller has undertaken to give a prose rendering, and he can hardly be said to have succeeded. Open the book at almost any page of “Tartuffe,” and read the English; then run through the French on the opposite page; memories of Bohn will come to you inevitably. The translation is correct enough; but the elegance, the charm, have gone. Two short speeches may serve as an example:—“*Elmire*: Your delusion has lasted too long, and you have taxed us too much with imposture. You must, to satisfy me, and without going any further, be a witness of all that has been told you. *Orgon*: Be it so. I take you at your word. We will see your cleverness and how you can carry out this undertaking.” It is only fair to add, what must be obvious, that the difference between the original and the rendering is less marked in “Don Juan,” which is written in prose and is on a much lower plane of literary excellence.

French Prose Composition. By R. R. N. Barton, M.A. viii. + 125 pp. (Methuen.) 2s. 6d.—A very good selection of English passages, some moderately hard, others offering very considerable difficulties. In the First Part each piece is followed by a “vocabulary” of words over which a pupil might go wrong if he had the dictionary only, and by notes which suggest the proper way to turn English phrases by recasting them in such a form that the words can be literally translated. The Second Part consists of thirty well-chosen passages without any such aids. A Key is published for the use of teachers.

Gottfried Keller, Kleider machen Leute. Edited by M. B. Lambert. ix. + 140 pp. (Heath.) 1s. 6d.—This amusing story, of moderate difficulty, makes a good reading book. The editor has supplied a brief account of the gifted author of “Der grüne Heinrich.” In a second edition it might be found possible to add a few of his fine lyrics. The notes are fair, and the

vocabulary is good. A picture of Keller forms the frontispiece.

The Pictorial German Course. Edited by Henry Baumann, M.A. a-e + 126 pp. (The Modern Language Press.) 2s.—This German Course is a kind of compromise between old and new methods: first a grammar lesson, then a number of German sentences based on an ugly picture (often typically English), with the words translated in the margin. A very large number of words are given, but there is no repetition of these; indeed, the exercises are quite inadequate. The German type used is very bad, and the proof has not been read with sufficient care. We cannot recommend the book as a German Course; but for purposes of revising the vocabulary of our pupils it may serve. The publishers inform us that the lessons are placed upon phonographic records; but as we have had no opportunity of hearing them, we cannot express an opinion on their value.

Rivingtons’ Modern German Series (Beginner’s Text). (1) *Deutsches Allerlei.* Prepared and selected by R. J. Morich. 54 pp. (2) Selections from *Hebel’s Schatz Kästlein.* Adapted and edited by R. J. Morich. 46 pp. (Rivingtons.) 9d. each.—The first of these booklets contains a small number of anecdotes, from twelve to twenty lines in length; twenty *lustige Schnurren*, most of which are extremely silly; and short poems, some of which seem singularly out of place—particularly Uhland’s poem “Die Rache” and Schiller’s “Drei Rätsel.” The selections from the “Schatz Kästlein” are more acceptable; Hebel’s simple language and sound common-sense will be appreciated by the beginners for whom the volume is intended. The notes and vocabulary in each case are satisfactory.

Ferdinand Schrafer, Friedrich der Grosse und der Siebenjährige Krieg. Adapted and edited by R. H. Allpress, M.A. xvi. + 161 pp. (Macmillan.) 2s.—This short account of the Seven Years’ War is brightly written, and can be recommended for use in Army classes. The style is perhaps not quite so excellent as the editor thinks; there is the excessive use of the superlative which is often found in popular patriotic writings, and there is not much variety in the vocabulary, the same phrases having to do duty many times, and often at very small intervals. The notes are satisfactory, though at times not quite full enough. Thus the phrases, *etwas im Schilde führen, einem die Spitze bieten*, should have been explained; in connection with the battle of Kunersdorf, some reference should have been made to H. von Kleist; with *gehangen* (p. 31, l. 17) compare the very common *er hing seinen Hut auf*. There are very few slips in the printing; we have noticed *sehl* for *fehl* (p. 51, l. 2); *Cologna* (p. 80, l. 9). A list of strong verbs and a vocabulary (practically complete) are added, as well as the appendices with words, phrases and passages for re-translation usually to be found in the volumes of Mr. Siepmann’s popular series. The “Word and Phrase Book” and the “Key to the Appendices” have also been published.

History.

The Abbey History Readers. Book III. The Tudor Period. 163 pp. 1s. 3d. Book IV. The Stuart Period. 221 pp. 1s. 6d. Book V. The Hanoverian Period. 192 pp. 1s. 6d. (Bell.)—We reviewed the first two books of this series in our last issue. We can but repeat what we said then, and add that the eighteenth century is better treated than it is generally in books of this kind.

The Granville History Readers. Book II. From the Roman Period to the Wars of the Roses. iv. + 207 pp. 1s. 3d. Book III. From the Wars of the Roses to the present Reign. iv. + 226 pp. 1s. 6d. Edited by T. J. Livesey, revised by

R. Smythe. (Burns and Oates.)—In these readers there are pictorial illustrations of various merit, and summaries of the lessons. The publishers in an accompanying circular say that "the first purpose of these volumes is to serve as reading books rather than as rigid manuals of history." We think they have achieved their purpose, at least on the negative side. Book II. is fairly correct, but Book III. contains the most extraordinary statements. The Rye House Plot is invented by Titus Oates. Shaftesbury is one of the Tory leaders in Anne's reign, and the South Sea Company becomes bankrupt in 1720. These are some of the more obvious deviations from "rigid history." Every person in these books has an epithet—"clever and witty," "good," "bad," "wicked," &c.—a plan which is likely to give children wrong ideas as to the simplicity of describing the characters of men.

Geography.

The Pictorial Geographical Readers, Asia. 256 pp. (Longmans.) 1s. 8d.—A pupil who has read carefully the fifty-five "lessons" in this book will have gained a clear idea of the structure, climate, and products of Asia, and of the connection between them and human occupations. The book is well illustrated; an appendix of thirty pages presents the geography of the continent in a summary form, and contains several useful maps and diagrams.

We have received from Messrs. Ginn and Co. two more books in their "Youth's Companion Series," entitled *Under Sunny Skies and Towards the Rising Sun*. There is one point about this "American Invasion" that is always striking us—the uncompromising nature of the orthography. English schoolboys look with surprise on such words as *traveled, honors, centers*. "Towards the Rising Sun" contains sketches of life in India, China, Japan, Korea, by various American writers. "Under Sunny Skies" deals in a similar manner with the countries bordering the Mediterranean. The books will prove interesting to youthful readers, either in or out of school. Each contains 138 pp., and costs one shilling. We are not particularly struck by the illustrations, but can personally recommend the series for use in the lower forms of our secondary schools.

Grammar and Composition.

A Practical English Grammar. By F. Ritchie. xii. + 254 pp. (Longmans.) 2s. 6d.—The writer of an English Grammar is confronted with many difficulties; for example, those due to a lack of uniformity in the use of terms, and to a tendency to follow the lead of Latin in all things. Mr. Ritchie has given us a book that we can confidently recommend. In the first place, there is a copious supply of suitable exercises, well graduated. Secondly, his terminology is satisfactory. Thirdly, Latin models are not slavishly adhered to, and, consequently, as an "English" Grammar the book may be recommended for its accuracy. The author has done well in making much use of Mr. Mason's books; they are still, in many respects, unsurpassed. At the bottom of p. 14 *Pronoun* is a misprint for *Preposition*.

Science and Technology.

Nature Study and Life. By Clifton F. Hodge, Ph.D. xvi. + 514 pp. (Ginn.) 7s.—There are as many methods of teaching nature study as, according to Kipling, there are ways of constructing tribal lays; and, if it succeeds in training the child to see what he looks at, and to think about what he sees, "every single one of them is right." Prof. Hodge is an experienced teacher, and he frankly admits that utility is the key-note of his method. He relies largely upon the domesti-

cation of animals and the cultivation of plants as a means not only of arousing a spirit of research, but also of training the æsthetic and ethical sides of the pupil's nature. Of structural botany and zoology, therefore, the book contains little; it is concerned rather with out-of-door interests. The subject-matter is rich and varied, the style is stimulating, and the book is beautifully illustrated. Though it is an essay rather than a text-book, teachers will find it full of valuable suggestions.

Injurious and useful Insects: an Introduction to Economic Entomology. By Prof. L. C. Miall, F.R.S. viii. + 256 pp. (Bell.) 3s. 6d.—Beginners who wish to acquire a practical knowledge of our common insects will find this book most useful. It commences with a short course of practical work on the structure of the cockroach, and then passes on to the examination—in order of difficulty—of the structure and life-history of well-known types of the various orders. Part III. deals with classification, and Part IV. with methods of exterminating insect-pests. We are glad to see that Prof. Miall employs plain English, whenever possible, in place of the technical terms which too often repel the elementary student from one of the most fascinating branches of biology.

Nature Lessons with the Blackboard. By F. F. Lydon. 88 pp. (Burns and Oates.) 3s. net.—We can speak highly of these 43 full-page schemes for blackboard illustration, but their value is almost neutralised by the notes of lessons which accompany them. These latter, with one or two exceptions, betray a misconception of the most elementary principles of biology, and abound in inaccuracies. We are sorry to find that polar bears, ostriches and elephants are still regarded as suitable subjects for "nature" lessons in English class-rooms.

Miscellaneous.

General Information Test-Papers. By P. Lyddon-Roberts and E. E. Denney. 45 pp. (Normal Correspondence College Press.) 6d. net. Key 1s. net.—There is a danger that the introduction of questions to test the "general information" of candidates at the King's Scholarship examination will encourage pupil teachers to learn by heart all sorts of quaint facts and pellets of information which really will do nothing towards educating them. The authors of the questions before us are well known as coaches for the examinations to which teachers in elementary schools have to submit, and they have taken the shortest way of supplying their clients with "information" in the form of questions and answers. Many of the questions are good and will serve to develop the intelligence; others are not satisfactory. Why need anybody know who wrote "The Sorrows of Satan"? Yet it appears in two of these papers. Or, what good purpose is served by naming six sciences, excluding eight the names of which are supplied? Is it not time to learn the cost of a journey to New Zealand and other places when one has to go to them, or to pay the fare of some other passenger? The fact is that, unless these "general" papers assist the growth of common sense, they are not very valuable; they only help to make incomplete encyclopedias.

Key to Cooke's Test Papers in General Knowledge. 224 pp. (Macmillan.) 4s. 6d. net.—Attention was directed to Mr. Cooke's test papers in our issue for July (p. 245). Instructors at pupil-teachers' centres and candidates for the King's Scholarship examination will welcome the key which Mr. Cooke has now prepared, for reference to it will supply information not easily accessible to ordinary readers. Appendix II., giving the sources of familiar quotations, should be particularly useful.

School Gymnastics on the Swedish System. By Allan Broman. 114 pp. (Bale, Sons and Danielsson.) 3s. 6d.—The author

has given us the purest form of the Swedish System in his book, the title of which correctly describes its contents. There are so many expounders of this system that it has been difficult to decide whose interpretation is the best. This book settles the question in favour of the author, though, from the alterations introduced in the present edition, it is evident that finality in this system is not yet reached. Confusing terms of former editions are replaced by others which more clearly indicate the performance of the exercises. The second part of the edition deals with gymnastics as a means of physical education, and is worthy of the careful study of all concerned in the physical welfare of the young. The illustrations are excellent, but some of them would be more appropriate if they depicted scholars instead of adults. The great want of this system is attractiveness, which has induced many to discard it in favour of one more recreative in character, and with which dumb-bells and wands could be associated and music advantageously introduced. To teachers and others desiring to give the system a trial this book is strongly to be recommended, as it is (with the exception of the late Baron Posse's work) the best exposition printed in English.

Education in the Netherlands. By J. C. Medd, M.A. Special Reports on Educational Subjects. Supplement to Vol. VIII. (Eyre and Spottiswoode.) 5d.—As all readers of Mr. Medd's previous publications would expect, the little volume before us is remarkable both for the ability of its author and for his enthusiasm. So true an appreciation of the determining factors in a successful system of education is evident on every page of the report that, as the reader passes from page to page, the mental picture of what is actually happening in the schools of the Netherlands grows in vividness until the reader begins to believe that he has actually seen and heard the teachers at work. "Intelligent enthusiasm is a characteristic of all Dutch teachers. The teacher is alive; there is no lading out of unrelated facts, and there is an entire freedom from dull mechanical methods." "In the Netherlands, as elsewhere, the quality of each school depends mainly upon the character, capacity and sympathy of the teacher, and the public spirit of the school authorities." By remarks like these Mr. Medd shows that independent observers, even though they have no personal experience of work in the class-room, can, when they possess a wide sympathy, justly and adequately estimate the relative values of educational methods. We cordially commend this supplement to the attention of teachers anxious to keep abreast of modern methods of education.

The Rose Reader. A new way of Teaching to Read. By Edward Rose. 231 pp. (Methuen.) 2s. 6d.—We do not know whether this is Mr. Rose's first work: we hope it will not be his last. "If you can once teach a child to read for pleasure, your work is done." "We must find out what actually *does* interest a child—not merely what, according to our grown-up ideas, ought to interest him." Here speaks the enthusiast, and behind his speech there appears to be knowledge and wisdom. Briefly stated, the book advocates the use of phonetics—but no phonetic symbols jar upon the conservative respect for the alphabet. It advocates the use of pictures to recall symbols to the child mind: but this, like the use of phonetics, is no new thing. The discovery of Mr. Rose is, we think, this: that the pictures hitherto provided are misleading and inadequate, and that pictures and phonetics together help one another amazingly. The illustrations are charming, and the pictures whereby O and S are represented—(a) as sounds, (b) as ideas, (c) as letters—would, we think, convert anyone at once. The teacher who can draw, and surely nowadays this means every teacher, will find this book a source of delight: and the reviewer only regrets that he cannot go straightway

and use it with a class that has never learnt its alphabet. It is next to impossible to make it plain how Mr. Rose connects *g* with *g*-lasses, or a pair of spectacles; *a* with *a*-pple, *i* with *i*-nk, *u* with *u*-ch, and *n* with *n*-arrow; but it is all done convincingly. A. M. Sowerby has illustrated the book, and to him (or her) great praise must be given. Part I. costs sixpence, and this part will be quite enough to show the intelligent teacher how much labour may be saved, and how pleasant the learning to read may be made. In these days of outlandish methods and of many books, we can heartily recommend one so simple, so clever, and so beautifully prepared.

CORRESPONDENCE.

The Editors do not hold themselves responsible for the opinions expressed in letters which appear in these columns. As a rule, a letter criticising any article or review printed in THE SCHOOL WORLD will be submitted to the contributor before publication, so that the criticism and reply may appear together.

Migration of Birds.

IN your "Nature Notes" for September you suggest sketch maps for the migration of the birds. I should be extremely obliged if you could suggest to me books or other means whereby I could get such maps, or ideas for the same.

F. M. WETHERMAN.

Clifton, Sept. 5th.

THERE is a great deal of information given under "Birds" in the "Encyclopædia Britannica" which may be available for your correspondent, who may also refer to "The Structure and Life of Birds" (ch. xiv.), by F. W. Headley. But most modern books that deal with bird life generally will contain something on the subject, for the migration of birds has been studied very thoroughly of late years, and is treated by both English and continental writers.

The four regular flight routes of birds to Africa are:—

- (1) Across the Straits of Gibraltar.
- (2) From Genoa through Corsica and Sardinia to Tunis.
- (3) From Italy *via* Sicily and Malta to Tripoli.
- (4) From Asia Minor by Cyprus to Egypt.

E. S.

The School World.

A Monthly Magazine of Educational Work and Progress.

EDITORIAL AND PUBLISHING OFFICES,
ST. MARTIN'S STREET, LONDON, W.C.

Contributions and General Correspondence should be sent to the Editors.

Business Letters and Advertisements should be addressed to the Publishers.

THE SCHOOL WORLD is published a few days before the beginning of each month. The price of a single copy is sixpence. Annual subscription, including postage, eight shillings.

The Editors will be glad to consider suitable articles, which, if not accepted, will be returned when the postage is prepaid.

All contributions must be accompanied by the name and address of the author, though not necessarily for publication.

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A Monthly Magazine of Educational Work and Progress.

No. 47.

NOVEMBER, 1902.

SIXPENCE.

SUGGESTIONS FOR THE REFORM OF METHODS OF TEACHING CLASSICS.

By E. A. SONNENSCHN, M.A., D. Litt. (Oxon.)

Professor of Latin and Greek in the University of Birmingham.

HAVING been invited by the Editors of THE SCHOOL WORLD to contribute to the discussion of the subject indicated by the above heading, I gladly avail myself of the opportunity of writing on one or two points to which my attention has been called by many years' experience of the qualifications possessed by school boys and school girls entering college; though I am aware that some teachers regard "reform" in the time-honoured disciplines of Latin and Greek as out of the question, and suggestions for the same as more or less of the nature of an impertinence. I can only hope that readers of THE SCHOOL WORLD are not among their number.

My suggestions fall into two groups: (1) those relating to improvements in the teaching of the Latin and Greek languages; (2) those relating to the teaching of the classical literatures.

(1) Under the head of language, my main concern is with the elementary stage of teaching. I am not content with any method which divorces reading, writing, and grammar teaching. Yet as currently taught, reading, writing, and grammar are to a large extent divorced. The grammar is taught as a preliminary and a thing apart; the reading and the writing do not always go hand in hand. Again, I do not believe in a reading book which in respect of its subject matter is distasteful or meaningless to the youthful mind. Perhaps the term "abstract" will serve to characterise both the errors to which I have alluded. The grammar teaching is too abstract; the subject matter of the sentences which form the bulk of the reading book is too abstract. No doubt a rigorous application of the oldest of old-fashioned methods may produce, and has often produced, excellent scholars; but the days of mere rigour are over or numbered, and I am one of those who think that equally good results may be obtained by a method tempered by the modern spirit of gentle persuasion and appeal to the minds and interests

of the young—a method which can be applied without so great an expenditure of effort and leaves no distaste for study behind. In a word, I see no reason why the learning of Latin and Greek, in becoming less revolting, less mechanical, and less contrary to nature, should cease to be a valuable discipline, or why teaching, when it becomes more sympathetic and more humane, should lose its power of turning out the highest type of scholars.

But I am far from advocating the so-called "natural method" of learning the classical tongues, or, indeed, any foreign language. What I want is a method which combines some of the features of the "natural method" with the advantages of art, and order, and system. Grammar is a way of systematising a language, and it cannot be neglected with impunity. But does it follow that it must be swallowed whole or apart from that concrete speech to which it owes its very existence? I think not. Let the pupil learn so much grammar as is necessary for the immediate purpose in hand; and let that purpose be determined by a reading book in which small doses of grammar, arranged according to a well-considered plan, are *made to be sufficient* for the interpretation of a piece of Latin of interesting and intelligible content. It would be quite a mistake to describe this as a non-grammatical method. The pupil gets his grammar—or gets to his grammar—in the approved form; but it is grammar pressed into the service of man—grammar divested of its mystery and unintelligibility. I have tried this method of teaching with my own children; I have also tried it with classes of beginners of somewhat more mature age; and I have found it work well. No doubt it calls for vigilance and activity on the part of the teacher; but at the same time it makes the work interesting to the teacher as well as to the taught. After a certain amount of grammar has been taught in this way and the pupil has got to see what grammar really is—not a set of arbitrary and *a priori* prescriptions, but a summary of the principal usages of the language based on observation and simplified by science—then there is no reason why he should not go ahead at a more rapid rate and fill up the gaps in his grammatical knowledge by dint of sheer mechanical rote work. The knowledge thus ac-

quired will not stick so fast as that acquired on the slower and more interesting method; but it will serve to enable him to attack an easy Latin author, and the impression made will be deepened by time and repetition. At any rate, he will not have acquired any misleading habits of thought or rooted prejudices which will be stumblingblocks to his future progress. All his knowledge will be firmly based in reality, and his mind will at the same time have received a fore-taste of the discipline of observation.

I must not pass from this part of my subject without a word on the cultivation of the ear side by side with the cultivation of the eye. Current methods, I am convinced, rely too much upon the eye alone—upon the look of the word on paper as distinct from the sound of it to the ear. Yet surely a word or a phrase is remembered more easily by its sound than by its look. And a language which exists for the student of it only on paper is only half a language. I would go further and insist on the importance of as much oral work as possible. No teacher of Latin and Greek neglects this altogether; perhaps most teachers rely on it more than they know. And in the schools of the past the oral element occupied a more prominent position than it does at the present day. In this matter we may wisely revive the practice of our forefathers and make Latin and Greek as far as possible living languages. To treat them as dead is the best way to kill them. To cultivate the art of reading aloud with intelligence and expression goes a long way to make them live again in our schoolrooms: but we may go further and make easy conversational exercises a part of our elementary drill. Professor Mahaffy, in his address to the Modern Languages Association last year, recommended that the system of teaching the classical languages should be assimilated to that which he had shadowed forth for the teaching of modern languages. That there are differences between modern languages and ancient languages involving differences in the methods of teaching may be freely conceded. But, at any rate, the antithesis so commonly heard, that the method in the one case depends on the cultivation of the ear and in the other on the learning of grammar, is a false antithesis. Grammar plays a part in both cases, though not exactly the same part; so does cultivation of the ear. The true distinction between the ancient and the modern in this connexion is not easy to formulate in brief; but it seems to depend on the fact that modern languages are less remote from our own sphere of thought and expression, and therefore less in need of an exhaustive grammatical analysis to make them intelligible than ancient languages; and that the power to converse is more of an imperative necessity in the one case than in the other. But a protest is needed against a definition which represents modern languages as chaotic and Latin and Greek as a kind of Chinese puzzle to be put together according to rule. No language can be taught without some appeal to the sense of speech possessed by the pupil; and the sooner this is

recognised in theory as well as in practice the better.

(2) The study of classical literature is of course part and parcel of the study of the classical languages, and can only be separated from it for convenience of discussion. I would have the pupil approach his first Latin author, and even his first Latin reading-book, in a literary spirit; that is, I would have his attention directed to what is said and not merely to the language in which it is expressed. To think of the meaning is a way of keeping the mind alert and preventing the formation of a bad habit of mechanical reading. If the book is Caesar, let the pupil try to follow the main outline of the narrative with intelligence; if a poet, let him learn to feel what the poet wished his readers to feel. It does not follow that the young pupil should attempt to grasp *all* that there is in the book he is reading; but he should try to grasp what he is capable of grasping. If there is nothing in it that he is capable of grasping except the language, then the book has been ill-chosen. I am well aware of the difficulty of finding classical works adapted to the minds of the young, and great care is needed in the selection of authors as far as possible suitable to the various ages of the several forms of a school. This consideration is too much neglected in England, with the result that pupils in the lower forms often read authors who are altogether above their heads. In Germany the *Lehrpläne* prescribe certain authors for certain forms, regard being had not only to ease of language but also to intelligibility of subject matter. The "Odyssey" comes early in the Greek course, though not until the Attic accidence has been mastered. Sophocles comes only in the two highest forms. Examining bodies have been largely to blame in the books that they have prescribed; but teachers also have been too indifferent in the matter. They have been too ready to think of the classical authors as so many specimens of the language, or of dialects of the language, and too little alive to their character as human documents. Can there be a surer way to stultify the literary sense?

There are two points in this connexion on which I would lay special emphasis.

(a) Let attention be directed in a single-hearted fashion to the matter in hand, and not dissipated over all sorts of matters arising out of it. Detail should be studied only so far as it throws light upon the main conception. What I am opposing here is the "peg-system," as it is sometimes called, whereby the text under study is made the vehicle of all sorts of learned comment upon points incidentally alluded to by the author. The system is a weariness to the flesh, and the wood is generally invisible owing to the trees. Let us frankly give up the idea that our pupils after reading a classical work shall be prepared to answer any question suggested by it; let us be content if they have understood it as a whole. If they do, they will have gained something far more valuable than a mass of antiquarian lore *de omnibus rebus*. Examinations must be improved; but improve-

ment will only come if teachers set up a standard of good teaching and aid in the formation of public opinion. It would often be a distinct gain if teachers were to take up the attitude, "What I do not know is not knowledge for the purposes of this class."

(b) Secondly, I would have works of classical literature read so far as possible as literary wholes. No author can produce his proper effect upon the reader if he is read in a perverse order. Yet what order is maintained in the reading of such a work as the "Aeneid" in our schools? No attempt is made to give the pupil a consecutive idea of the poem as a whole; the several books are read in any order that chance may dictate. Vainly does the poet plunge *in medias res* if his reader repeats the process by taking him up in the middle, then proceeding to one of the last books, and ending perhaps with a study of Book IV. Such a method of study is literally preposterous.

How, then, are we to proceed, it may be asked? Most of the classical masterpieces are too long to be read from cover to cover. Yes, but does it follow that the idea of sequence in reading must be abandoned? To study a literary work as a literary whole does not necessarily involve reading the whole of it. The teacher may omit large sections as not essential to the story, and replace them by summaries of their contents sufficient for the purpose in hand, supplementing them, if you will, by translations in English of parts of the omitted passages. I am not pleading for "selections"; for selections merely give specimens, whereas the method which I advocate preserves the unity of the work intact. Some classical works do not need abbreviation for school purposes; for instance, the Greek plays, though some passages might be occasionally curtailed, such as the account of Io's wanderings in the "Prometheus;" others lend themselves to an episodic method of reading, such as the "Gallic War" or the "Metamorphoses." But there are others which ought to be presented to the pupil in an abbreviated form, and then read consecutively. A conspicuous example of this is the "Aeneid." If the first half of it were thus mastered in outline at school, a sound basis would have been laid for further study at the university, and I believe the development of the pupil's literary taste would have been consulted better than by a haphazard and scrappy method of reading odd books. For to disregard the sequence of an epic is to take its interest and much of its meaning out of it. The beauty of the parts cannot be appreciated if the beauty of the whole is lost sight of.

"The best is the enemy of the good" is a saying which has its application to the history of classical teaching. A false conception of thoroughness in grammatical training and a too ambitious programme of literary study incapable of being carried out in practice have been responsible for some of the faults to which I have called attention.

VERSE WRITING.

By W. H. D. ROUSE, M.A.

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THE opponents of classical education have never failed to deliver a bold attack on verse-writing, which they judge to be the weakest point of a weak position. It appears so very obvious that a poet is born, not made, that they feel they have only to state their case and win it, with an added joy that their victory is won by a weapon from the classical armoury. They have also the abuses of past generations to quote, and the more modest claims of the present are confused with these. But now the hubbub has somewhat subsided, and it has been discovered that man does not live by the laboratory alone, it may be of service to state briefly what are the benefits of verse-writing, and how far it can be taught.

In the first place, verses are not always poetry. If our claim were to teach schoolboys to write poetry, we might well despair, but it is not. Verse-writing for the average boy means learning how to render thoughts of others in metrical form. The poetry, or what passes for it, is supplied; the task is formal. It is the same in kind as prose translation, but different in degree, and more difficult. The earliest stage consists in arranging given Latin or Greek words to fit into a metrical scheme—a kind of literary puzzle, which may be made quite interesting to minds in a certain stage of their growth, the solving of which teaches quantity and the rules of metre. Moreover, it is the easiest way of learning quantity, and without quantity the ancient languages are not. To study Greek or Latin without reference to quantity is to treat language as a thing of books, not as speech addressed to the ear. Any corrective to this particular fallacy is useful now-a-days, when the minds of the uneducated are so askew that they confuse language with spelling. Verse-writing is also the easiest way of learning thoroughly the rules of ancient metre; and how can poetry be rightly appreciated if its rhythms are not understood?

Secondly, verse-writing is the best way of bringing home to a pupil what is meant by literary form. This is especially true of the Latin elegiac couplet, which has therefore a value in literary training far beyond what Latin elegiac poetry is worth as poetry. No pupil can fail to see that there are certain definite rules which must be observed, otherwise his work is "bad form" from a literary standpoint. This learnt, he can be led step by step to apply the principle to antistrophic verse, and finally even to prose. Here he has the priceless aid of the Latin period; but periodic laws are not nearly so strict or so obvious as those of the elegiac.

Both the first two stages, the elementary, consisting of the arrangement of given words in a metrical scheme, and the second, the rendering

of full-sense English into the elegiac couplet, are well within the reach of the average boy or girl; they do not need much time, if not too early begun, and the advantages are obvious. The next stage in Latin verse-writing leaves the pupil to choose his own epithets; and this may serve to train a rudimentary feeling for what is fitting. He will have to keep his eyes open to choose what is properly descriptive; to avoid inconsistencies and contradictions with the rest of the picture; in a word, to think, and the thinking will impress on him the conviction that unity of conception is necessary in a literary piece. He will learn that a sun which scorches must not be called "gentle," a goat fast asleep on a rock must not be represented as leaping, nor the soft breeze of summer be rendered by blustering Boreas. Training of this kind he will never get from prose translation, where his task is merely to render a given thought with exactness.

In later stages, where he has to render an English poem, memory and imagination will both be brought into play, when he thinks how this or that thought would be expressed by the ancients, how a certain picture would have struck them. Here the sheep will begin to separate from the goats, and the teacher will pick out those who show aptitude for higher flights; the rest, having learnt all they can take in, now turning their attention to more useful or congenial pursuits. And in the Latin hexameter and Greek verse ample scope will be found for ingenuity and skill in coping with difficulties, and for poetic feeling or imagination.

Verse, again, has distinct advantages over prose. For one thing, its range is wider; the higher emotions and passions are rarely expressed in prose, but in verse find their proper place. Again, the subtle associations of words are felt far more keenly in verse. Everyone knows the line which compares the ancient city of Petra to a rose—

A rose-red city, half as old as time.

Substitute *rose-bud* for *rose-red*, and the line becomes ridiculous. In verse we cannot away with a vulgar or trivial association when speaking of great things; but in prose the opportunities for such a mistake are rarer, and the mistake, if made, is less offensive. Verse alone can give a training to the literary sense in all its delicacy, even for those who do not pretend to be poets.

"But," says Apollyon triumphantly, "the same arguments apply to English." They do, and to French and German, or to any other language which is to be studied as a literary medium rather than as a means of informing customers of the price of tea or sugar. The technique of English verse ought to be taught as part of English composition, and in some schools exercises are actually set in English verse. Naturally this does not take nearly so long to learn as Latin or Greek verse, but the advantages are of the same kind and are great. A rather extensive acquaintance with the works of minor poets leads me to believe that the

technique of English verse is not learnt merely by reading; it is possible that, if the study of verse had been carried further in the past generation, the works of minor poets might be less faulty, and perhaps some of the writers might even have learnt at school that more goes to the poet than a desire to write poetry. This is a very practical advantage.

Such, in brief, are the advantages of Latin and Greek verse-writing; and it will be seen that the main objections to it are met in the proposed scheme. No one would ever advocate that verses should be begun early, practised constantly and continued in spite of Minerva. The elementary stages, indeed, which are within the reach of practically all, should be gone through by all; but verse-writing should be begun later (say, when the boy has been reading Ovid for a year), and discontinued in the third stage as soon as a fair trial has proved that a pupil has got to the end of his capacity in that line. The time will not have been wasted; all will have learnt something of quantity and metre, of literary form, most will have learnt a little of poetic diction, many will have awakened the imagination and purified the taste, and in addition the mastery of difficulties will have given some added power to deal with the problems of prose composition.

SCHOOL EDITIONS OF THE CLASSICS.

By PERCY SIMPSON, M.A.

IN what form can a Greek or Roman writer best be put before the modern schoolboy? Editions flood the market, and the stream will not run dry till every "series" is complete. Is it possible to find in them any guiding principle, any clear conception of method? The work is too limited in scope to leave much margin for original treatment; but need it be a mere compilation "knocked off," as the phrase goes, when the day's work is over? Somebody lately made himself responsible for the statement that masters do their editing in school hours. I have never known a case of this, and in any school where it is possible the boys must be exceedingly tame. But it is undeniable that much raw and hasty work has found its way into print. Possibly it was done at high pressure; but a man too lacking in self-criticism to revise either his manuscript or his proofs should ask a charitable friend to do this office for him. In an extant edition of Caesar there is a note on a construction offering as alternative explanations: (1) that Caesar was trying to be clear; (2) that he was confused. The editor, eager to exhibit the working of Caesar's mind, gives an exquisite revelation of his own. Perfectly natural, in the circumstances; but why obtrude it upon boys?

Notes on elementary grammar are, perhaps, the worst blot in current text-books, the want of pro-

portion is so ludicrous. An editor seems to say to himself, "Whatever happens, I must make a point of the grammar;" and every construction, hard or simple, is pitilessly run to earth. *Neve liturarum pudeat*, says Ovid to his *Tristia*; a scholar who has produced a careful and in many respects an attractive school edition annotates: "*Sc., te.* The impersonal verbs *pudet*, *piget*, and the like, take an accusative of the person and genitive of the thing." Naturally, that is a point to be raised in class; but a boy ought to get it from his grammar, and not in this way escape the trouble of thinking. Still worse is the tendency, now greatly on the increase, to classify ordinary constructions in an appendix. The subjunctive mood, for instance, is displayed in a cut-and-dried assortment, jussive, deliberative, final, and so forth, with a series of references to the text. A boy soon loses himself in a tangle of syntactical usages, and the most helpful clue that can be given him is to make him fill in such outline lists for himself. Instances collected in that way appeal to his intelligence and lodge themselves in his memory. But I hold it not honesty to have them thus set down by an editor. His energies should be reserved for writers who need special treatment—for Homer, say, or Tacitus; and, of course, a poet will require more annotating than a prose writer. A beginner reading Ovid will not be familiar with consecutive *ut*, or will be bewildered by *quamvis* with indicative; he should have help for these conundrums. In the case of a poet, the best type of comment often is, "In prose the idiom would be . . .," leaving the boy to grapple with it from this point of view. And more use might be made of the interrogative form of note: "Why is so-and-so subjunctive?" "Is the sequence regular?" It is the accepted principle in oral teaching; judiciously employed in books, it might be made very suggestive. It would indicate in preparation time, when a boy has leisure to reflect, the existence of a problem which has to be faced. The class will soon come to regard it as a danger signal; they may go ahead for the moment, but there will be a collision next morning.

Translation is another trouble. Here, again, far too much help is given. The precise amount which is required is not easy to apportion; it varies with the author and with the age of the readers. But, broadly speaking, it should be confined to idioms utterly un-English in structure, and therefore tasking a boy's limited powers of expression; to clauses or sentences of extreme difficulty; to occasional suggestions with a view to style. In dealing with the last point scholars unfortunately sometimes require a lesson themselves.

ἔνοικίου δ' ὄρνιθος οὐ λέγω μάχην—

"I will not dwell on the fighting of the domestic fowl," says an editor, and we devoutly wish he wouldn't. If that is the manner of Aeschylus, our boys will pick it up quite rapidly without assistance from us. The question is supremely important. If Greek style merits all we say of it, the least we can do is to exhibit it to our pupils in a manner

not ignoble or ridiculous. Translation is a question for the class-room; but it is objectionable if an editor supplies an unsound model before the lesson begins. My own experience is that valuable work can be done here. I remember vividly the surprise and pleasure with which, in my school days, I lighted on Dean Wickham's rendering of *privata* as "unqueen" in Horace's ode on Cleopatra. I felt that there was poetry in that, that the dictionary would have failed me for it, and that, left to myself, I should have said, "as a private person." More than one happy turn of phrase came to me as a revelation. *Tremulo splendet sub lumine pontus* will for me be always associated with the first rendering I heard of it: "Light dances on the gleaming sea." But touches like these, to be effective, must suggest and stimulate; they must therefore be sparingly supplied. Amid the welter of notes on drier detail they should appear, like the wrecked sailors of the "Aeneid," *rari nantes in gurgite vasto*.

But if we agree to subordinate points of elementary grammar and to pare down an over-liberal allowance of translation, the notes will be mainly concerned with the elucidation of the subject-matter. Here precisely is the point in which an editor is useful, and even necessary. Puzzles of allusion or antiquarian references a boy cannot clear up for himself. But he can be interested in such things as the form of an ancient book, a soldier's accoutrements, or a Roman funeral. He looks with a certain amused curiosity on these indications of a life so different from his own. I sometimes suspect that the funeral pyre conveys far-off suggestions of a bonfire or fireworks; and he smiles when you tell him what use was made of the *imagines*. Full help should be given him in such points. But the range of the classical literature is too wide to admit of a complete discussion; a few typical cases only can be taken. To begin with history. Here the general treatment of the subject has greatly improved. Caesar's editors usually have something to say about the Roman army, and they discuss the campaigns. In this respect Mr. W. C. Compton's edition of the seventh book (Bell, 2s. 6d.) is admirable. In days when editors were satisfied with Napoleon III.'s compilation, or were apt to remark that such and such a village "seemed" to fit Caesar's description, Mr. Compton travelled over the ground, sifted the authorities for himself, and had sketches made on the spot. Our knowledge of this phase of the subject has widened of late years, and the criticisms and conclusions of Mr. T. Rice Holmes are sure to filter into school-books. But the political side of the "Commentaries" is still largely ignored, and their significance entirely depends upon it. Something might be done to indicate the nature of Caesar's apologia in a book like the seventh, which is not usually read with beginners. The skill with which Caesar has "edited" the narrative of Gergovia imperatively calls for comment. With Ovid, again, what unused sources of illustration exist in comparative folklore. For instance, the small boy whom Ceres turned into a newt because he was impudent to

her; when she transformed him, he kept for the moment his original size: "inque brevem formam, ne sit vis magna nocendi, contrahitur." Compare the Red Indian myth about the squirrels. Originally an Indian tribe, they were turned into animals for a punishment; but squirrels the size of a man did so much damage that the god had to make them smaller. If a boy finds this in his notes, he turns with fresh heart to the uses of *cum*; the very name "Red Indian" has magic in it. Or, in doing the "Georgics," let us keep an eye on the botany. Mr. J. Sargeant (Georg. I., Blackwood, 1s. 6d.) is an excellent guide to follow here; Mr. T. E. Page (Bucolics and Georg., Macmillan, 5s.) also has treated this point very fully and sympathetically. To sum up—for it would be tedious to specify further, and to begin a catalogue of editions—an editor, even in the elementary stages, can try to make it clear that the subject-matter has a human interest.

Illustrations are a great help here, and they have suddenly become the fashion. In books purely elementary archaic designs naturally appear modernised; but at a later stage exact reproduction is desirable if text and picture are to harmonise. One well-chosen illustration, not too accessible in other works, is worth a series of fancy sketches and reconstructions. The hoplite from a Greek vase which Mr. W. H. D. Rouse has reproduced in his Thucydidean excerpt, "The Retreat from Syracuse" (Rivington, 1s. 6d.), is an ideal specimen. In its combination of quaintness, spirit, and archaeological interest, it may be compared with the figures of the Bayeux Tapestry. Where old blocks are re-used, by the way, care should be taken in selecting them; they should not be too old. A view of the Forum, as it looked fifty years ago, throws no light on the text of Cicero, though it is offered for that laudable purpose in a late edition. An obvious subject for illustration is a page from a noted manuscript—such as the Laurentian Sophocles or Venetus A of the "Iliad"—to indicate the actual form in which the text has reached us; but it is rare to find this type of illustration.

Many points remain undiscussed, and among them the different treatment required by boys of different ages. Those at either extreme must be specially provided for. For the absolute beginner special means of help exist; probably most of us use simplified texts. These are useful for the boys, but the authors suffer. An admirable edition of this kind is Mr. J. W. E. Pearce's "Tales of Ancient Thessaly" (Blackwood, 1s.), an adaptation from Apuleius. It is open to objection as unclassical, but a boy at this stage of his reading pays little heed to style; he is too busy with the problem of fitting together nouns and verbs and smoothing out the constructions. He will certainly enjoy the romance. Sixth-form work, on the other hand, rises above the level of a school edition in the strict sense of the term. Typical books to use here are Thucydides in the masterly editions of Mr. Marchant (II., VI., VII., Macmillan, 3s. 6d. each), or Dr.

Reid's speeches of Cicero, which are a manual of Ciceronian style (Archias, Balbus, 1s. 6d. each; Milo, 2s. 6d.; Sulla, 3s. 6d.; Pitt Press), or Dr. Gow's "Odes of Horace" (Pitt Press, 5s.). The last in particular is marked by one quality as precious in a commentator as accurate scholarship—the union of terseness with lucidity. No point which calls for treatment is left untouched; yet throughout the book I doubt if there is a wasted word. That is not invariably a school-master's gift.

LATIN AND GREEK AT THE LONDON MATRICULATION EXAMINATION.

By S. E. WINBOLT, M.A.
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THE revised regulations for the London Matriculation Examination certainly came as a great surprise. We had convinced ourselves that no such revolution as is revealed in the new regulations for Latin was possible; and when the unexpected happened we felt stunned by the blow. But it is time to pull ourselves together. Possibly this thing may yet be capable of alteration; but if the upholders of Latin are to go under, let the victorious waves of the pseudo-liberal spirit choke the protest in our throats.

My present intention is to give the new regulations a candid consideration. Possibly I may be a less prejudiced judge of the case from the fact that during my experience of ten years' teaching my interests and work have been nearly equally divided between the modern and classical sides, with a slight balance in favour of the former. The points of the new regulations are these:—

I. LATIN is made an optional subject; set books give place to unprescribed passages; accuracy is especially demanded in answers to grammar questions and in the rendering of easy English sentences into Latin.

II. GREEK also is optional, and the requirements are the same as for Latin.

To clear the way I will approach the question of Greek first. I take it that at the present time there are not really two opinions about the position of Greek in the curriculum of our schools. It is the view not only of those insidious enemies of all education alike who confuse education with apprenticeship and ask for definite utility in all subjects taught, but also of the more thoughtful and cultivated few who ask merely that a just balance of subjects should be maintained, that a Greek training, in spite of its unique advantages, is only for those who show aptitude for it. No doubt in the history of the world the study of the ancient Greek language has been a *sine sacris hereditas*, an unmixed gain to the moral advance of humanity. But, except for the few, the study of this language is now unnecessary, because the

secrets of Hellenism have become part and parcel of the life and language not only of England, but of all the countries of western Europe and America. Modern history, philosophy and art have received the indelible impress of the Greek character. We should not now be in danger of losing our heritage of Hellenism if the line of Greek scholars entirely ceased from off the face of the earth. All the Greek that is likely to come to light has been translated into modern tongues with accuracy and elegance enough for practical purposes. *Ars longa, vita brevis*. Modern literatures and the departments of physical science clamour for a hearing, and they must be heard; and as human minds cannot assimilate much of everything, and as the advance of knowledge depends upon the conjunction of a modicum of general information with keen specialisation in one or two subjects, it is obvious that some of the old subjects must go by the board. Greek is one of these. Hellenism we may all have, but the Greek language is for the few minds that are naturally attracted to it. The simplicity and earnestness of Greek literature and art, so alien to our modern life, may still be felt by the Greekless; but we must be content to tell off some few to spend their days in the labours of philological minutiae and to keep us in contact with ancient Athens through the medium of the language of Pericles and Plato. For these and other reasons we can have no quarrel with the regulation which makes Greek optional.

Now let us turn to the Latin question. It is well that in place of the set books previously demanded a candidate should have to face passages not prescribed. Is it necessary to go through the arguments of this now generally accepted principle? That there should be questions on grammar is laudable but obvious, and that accuracy should be specially considered in assigning marks is only what would be expected. Composition in Latin, as here demanded, is undoubtedly *the* test of intelligent apprehension of the language in any stage of the student's career.

So far, then, we believe, the new regulations have been greeted with a chorus of assent; and there is only one point left for us to assail. But here's the rub. This one point of making Latin an optional subject serves to overthrow the whole classical structure which the framers of these regulations have built with such seeming liberality of spirit. And having reached this point of view, we look round and see that all this progressiveness, all this fine indulgence, is little but a deliberate blind. It is surely a Tantalus trick to make such pretty arrangements for an examination, and with the same stroke of the pen to rob it of ninety per cent. of its candidates. "Optional Latin means neglected, rejected Latin": so wrote Mr. Shipham in an admirable paper on this subject in the *Circular* of the Assistant-Masters' Association. It is a bold statement, but a true one. For how many candidates not in public schools will deliberately choose the toil and the moil of Latin if they can attain their end by other means? And the schools themselves—many of them will be sorely tempted

to let Latin slide in order to make sure of more liberal grants from technical instruction committees. The schools which are represented at the Headmasters' Conference are continually confessing that when the universities lead one way they are powerless to go another. If this is true for the great and powerful schools, how disastrous must be the effect of this new regulation on the poorer struggling schools. But leaving the probable effects to themselves, it is here our business to urge that the step now taken is one in the wrong direction, and reiterate, even to wearisomeness, the arguments for compulsory Latin. These arguments are not such as would be advanced only by teachers who have vested interests in Latin, and, moreover, they are not advanced in days when, as a century ago, thirty hours a week are given to Latin and Greek. We have reduced Latin in schools to its irreducible minimum: we cannot stand by mutely and see it entirely banished from the curriculum.

Let us look at the case historically. In the first place, the average schoolboy soon becomes aware that for centuries men who were brought up on Latin have qualified themselves excellently, character and intellect and all, for that inner life which is practically independent of the particular trade or profession by which a man earns his bread, which more than trade or profession determines his usefulness and happiness in the world. Aware of this, the boy cannot fail to have a strong presumption in favour of a Latin training.

Next, the healthy boy's mind, if rightly directed, soon appreciates the sportive interest of overcoming difficulties. Are we to emasculate all our system of study? Shall we not leave one discipline involving pains and hardships to be endured, and testing grit in the aspirant? In these dodgy days of options offered to striplings incapable of discerning, we feel disposed to be very loath to let go one of the last instruments of wholesome coercion. Latin is a hard language; it cannot be acquired by a quick ear; it tasks reasoning power, it demands memory. It is a test, as nearly infallible as may be, of a boy's fitness or unfitness to proceed with a mental training more advanced than that which is required for the lowest grades of industry or trade. De-classing is a social evil of our times, and we are now proposing to fling away one of the means best adapted to check the evil.

Third, we will advance in confident assurance what the enemies of Latin equally confidently call "the cant of the psychological argument." Accuracy and reasoning power are a sure result of sound training even in elementary Latin; that wider understanding which is applicable to any and all of the branches of human knowledge is steadily developed as the student progresses in his Latinity. Language and thought are inseparably interlaced; to progress in the one is to progress in the other, and it is a hundred to one that he who shows himself capable of grasping *the* language has in him the germs of a philosopher. These are the funda-

mental arguments bearing on the issue. Their general character is taken by the enemies of Latin to spell weakness, but we would ask whether the real value of anything worth the having is not infinitely easier to feel than to express, and whether any but the lowest forms of knowledge can be justified at every point on the ground of practical utility. Further experiments of a less essential calibre are: first, that the success of the technical schools of our rival, Germany, is largely attributable to the fact that Latin is taught in nearly all the secondary schools; and second, that the modern languages based on Latin are *ceteris paribus* acquired with much greater facility by the student of Latin than by the student who is Latinless. All these arguments apply to the acquirement of Latin up to the standard till lately demanded for the London Matriculation. We are not seeking to enforce a specialisation in Latin, but merely asserting the necessity of a good grounding in Latin as one of the essentials nowadays of the general training and knowledge that must precede specialisation.

I proceed to offer a few suggestions as to good books in the market. The list is in no wise meant to be exclusive:

LATIN.—Translation, grammar, and sentences are admirably covered by "Macmillan's Latin Course," in three parts. This is an excellent book, which I should unreservedly recommend.

Translation.—The moral of the regulations is that the translation done must be done thoroughly: the motto should be *thorough*. Read preferably books which arrange sentences adapted to the text, such as: Cicero "De Senectute," A. S. Warman (Bell); Caesar's "Gallic War," John Brown (Blackie), each book 1s. 6d., or "Livy, Book V.," Laming (Blackie).

A good deal of practice in *unseens* will be necessary: use, perhaps, Rivingtons' Single Term Latin Readers (six terms) (9d.—1s. each).

Grammar.—Begin with "Shorter Latin Primer" (Longmans) and later on use the larger "Latin Primer." In testing knowledge of grammar, use "Latin Examination Papers," A. B. Stedman (Methuen).

Sentences.—Apart from "Macmillan's Latin Course," and the sentence practice in the reading book, North and Hillard's "Latin Prose Composition" (Rivington), 3s. 6d., is very good, being skillfully graded.

GREEK.—**Translation.**—Begin with "First Greek Reader" (to the stage of Xenophon), by E. C. Marchant (Bell), 1s. 6d. Then Xenophon, with edition by G. H. Nall (Macmillan's Elementary Classics). Excellent also are "Thucydides," by F. H. Colson, and "Thucydides II. and III.," by Sutthery and Graves, in the same series.

For unseens, Rivingtons' "Single Term Greek Readers" (three terms), 9d. each, are handy.

Grammar.—Use Rutherford's (Macmillan), Grammar Papers, or A. C. Liddell (Blackie), or A. M. Stedman (Methuen).

Sentences.—First use Sidgwick's "First Greek Writer" (Rivington), then North and Hillard's "Greek Prose Composition" (Rivington), 3s. 6d. With Rutherford's grammar use "Exercises in Greek Accidence," adapted to Rutherford by H. G. Underhill, and "Exercises in Greek Syntax," by G. H. Nall (Macmillan).

THE CONSTRUING LESSON.

By W. H. S. JONES, M.A.

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THE construing lesson with which I became familiar during some periods of my school-days was of the following type. A certain amount of "author" was "prepared" beforehand. In this preparation we used the usual annotated editions and any other means we chose. "Cribs" were not encouraged, but were not forbidden. During the lesson the scholars in turn construed a few lines of the original. The renderings often consisted of a patchwork of tags from the notes combined with our own uncouth efforts. Then the master would point out blunders and ask some questions on grammar. Finally, he gave us his own version and a few notes.

When this system is successful, the cause lies, I am convinced, not in its inherent excellence, but in the personality of the teacher. For my own part, I found all such lessons excessively tiresome, consisting as they did of a weary succession of faltering versions. The teacher rarely spoke except to correct. It was all very uninteresting and no small strain upon the nerves. I have since tried much the same method as teacher. It was not long before I was compelled to abandon it, for I made very little headway. So I gradually came to believe, as I still believe, that the system is faulty in the following respects. The Latin and Greek tongues, if studied in this way, are "dead" indeed; but to the pupil they should be living. Before the lesson too much is done for the pupil—at least, for the more advanced pupil—by annotated editions; during the lesson too little help is given by the teacher.¹ Vigour and fluency are not encouraged. Insufficient attention is paid to subject matter. It must be borne in mind that, besides the immediate aim of the construing lesson, the teacher has other objects in view. He wishes to improve composition in Latin and Greek; to develop the pupil's power of expressing himself in English; to cultivate a literary taste; to awaken the critical faculty and a capacity for dealing with difficulties; to interest boys in the facts of ancient life, and make them bring this knowledge to bear upon the problems of to-day.

Now the suggestions I am about to offer are, I venture to believe, educationally sound, and they are principles which admit of many modifications in practice.

- (i.) Let the class learn how to *read* the classical languages with proper expression.
- (ii.) Let the boys be taught how to use an editor's annotations.
- (iii.) Questions and answers ought to be in Latin and Greek, as well as in English.

¹ A master of my school-days, whose memory is precious to many, used to say to us: "A learned schoolmaster is a mistake. What you need is a brilliant young ignoramus who will help you to solve your classical problems during the lesson hour." One is reminded of that best of teachers, Socrates, and his *συζητήριον*.

(iv.) Fluency and elegance should be insisted upon at the earliest opportunity—say, as soon as the class can make out the sense of an easy Latin author.

(v.) Subject matter demands adequate treatment.

I will now develop these principles by applying them to an illustrative construing lesson of one hour. The pupil's private preparation and the actual lesson will be considered separately. My remarks shall, as far as possible, embrace classes of every grade except the youngest boys, but I will distinguish when necessary.

THE PREPARATION IN PRIVATE.—Care must be taken to choose editions the notes of which do not give too much help in the way of translations. To translate is often merely to cut the knot, and if a translation of a difficult passage be given, the majority of boys will systematically discard the rest of the note. What is needed is an edition in which difficulties are clearly stated and scientifically explained. Mr. Page's well-known editions are excellent in this respect. Notes that *suggest* an explanation are useful in their place, and stimulate the more thoughtful boys. With the higher forms at least one book every year should be read with a plain text. The fact is that boys need to be taught how to use annotations. They seldom grasp the drift of an editor's remarks. But with a plain text before him a boy is forced to think, to be independent, and to solve problems for himself. He receives a training in research. Only those who have tried this plan can appreciate how it develops the power of tackling difficulties.¹

To secure thoroughness of preparation, and therefore fluency, the day's portion of author may be translated on paper before the lesson. If it be deemed inadvisable to continue the practice, it is at any rate useful in the first lessons with a fresh author. But in general it is unwise to have these translations read out in class, as attention is thereby withdrawn from the original.²

"Cribs" must be prohibited altogether. They are dishonest, and the proverb about honesty is somewhat musty.

THE LESSON.—This might include (i.) revision (five minutes); (ii.) reading and translation by the boys, with the teacher's corrections, notes, &c. (thirty-five minutes); (iii.) the teacher's translation (ten minutes); (iv.) *viva-voce* in Latin and Greek (ten minutes).

(i.) Revision should never be omitted. It is both a confirmation and a test of the previous lesson, and a few minutes devoted to questions are well spent.

(ii.) Young boys always find it difficult to track correctly the windings of a complex sentence, so that in their case one sentence, or even less, is enough for a boy to translate. Let each boy read his passage fluently and with just emphasis in the original. This will be an aid to composition, prose

and verse; it will accustom the ear to ancient rhythms; the teacher can often detect where the pupil has missed the sense of a passage, and the pupil amend mentally his own blunders from the teacher's corrections. The original pronunciation should certainly be reproduced as far as possible. Something has been done already for Latin, but Greek is sadly neglected. Boys are still led to suppose that an Athenian dog barked *aw, aw*, not *ow, ow* (*αὐ, αὐ*, Aristophanes, "Wasps," l. 902). Quantity needs special care. How can a boy appreciate the melody of verse when he is encouraged to say *bōnus, mīlēs, kārds*?¹

With more advanced classes, especially the Scholarship class, each boy should have a passage long enough to be interesting and to show whether he has mastered the general sense and the bearing of the various parts on the whole. Before commencing to read he might state, briefly and clearly, the substance of what he is going to translate. In this way a boy is taught to summarise, and to go to the root of a matter.

Then comes the translation. Accuracy, fluency, and good style are essential. Fluency is important for its own sake, and because it saves time for questioning and comment. Accuracy is necessary as a safeguard against superficial elegance, especially if the teacher wisely makes a point of good style. A mere word-for-word construe is generally justifiable only as an explanation of a difficult passage. Such a version cannot but be injurious. Being ugly it must tend to stifle any artistic sense the young scholars may have. From the first it should be impressed upon a class that an unnatural, un-English rendering is bad; that although occasionally a word-for-word construe is a translation, in the majority of cases it is not, and must be avoided. The construing lesson aims at producing, not a hideous jargon of English words arranged according to a foreign idiom, but the best version the scholar's powers enable him to achieve. After a boy has translated, one or two out of the class should be asked to criticise. Boys are bad critics; few, even in higher classes, know what to criticise in a performance and how to criticise it. When a difficulty arises, let the boys *locate* it, state exactly where it lies, and what it is. To locate a difficulty is, in many cases, to solve it. The difficulty clearly seen, an opportunity is afforded for practice in the weighing of evidence, for the correct explanation can be elicited by the Socratic method. In this way the pupil is prepared to profit by annotated editions.

There is a difficulty in making boys choose appropriate words. Their vocabulary of *recognisable* words is fairly large; their *working* vocabulary is small. Accordingly, alternative renderings should be asked for, and a few leading questions will often suggest a suitable phrase. English literature, especially the older writers, can supply many an

¹ A further advantage of this plan is that in time each boy collects with slight expense a useful library of complete texts.

² These translations serve very well as passages of English to be translated according to that admirable system advocated by Ascham in his "Schoolmaster."

¹ In a recent lecture on "How to Teach Latin," Prof. Wilkins remarked that a boy at his school would have been caned for making the last syllable of *mīlēs* long in his verses. The teacher would have said, "Don't you know that the *-ēs* of '*mīlēs*' is short?" "It was the teacher who needed caning," was Dr. Wilkins' comment.

excellent translation. Boys are delighted when they discover a classic phrase in Shakespeare, Milton, Pope, or the Bible, to represent some Latin or Greek idiom. A firmer grip of English, and an increased facility in choosing the right word, will be the reward of those older boys who master Trench's "Study of Words."

After the criticisms the teacher may rapidly dictate such brief notes as the previous discussion shows to be necessary. These should supplement and explain the notes of the annotated edition. A few remarks on sentence structure are invaluable. I have known boys improve considerably in Greek composition by being impressed with the fact that a participle often bears the chief stress in a Greek sentence. If the class can be interested in the subject matter, much has been done to kindle that spark of enthusiasm which turns drudgery into a labour of love. I shall return to this question later. Let me now mention the advantage that accrues from an appeal to the eye. The Attic dramatists become more interesting when a few photographs, restorations, models in plasticine or cardboard, have thrown light on the workings of the Athenian stage. The time will soon come, I trust, when every school will have its classical museum.

(iii.) When the day's lesson has been translated by the class and commented upon, it will be profitable for the teacher himself, if time allows, to read it in the original, clearly and with expression. The boys must *feel* the meaning. They must learn to *think* during the lesson in Latin and Greek, and appreciate the literary beauty of what they are reading. Mere translation is inadequate here. The teacher's own version should be a model in every respect. Let it be delivered fluently and impressively. Boys will appreciate such a rendering, and their attention will be caught in spite of themselves.

(iv.) The last ten minutes of the hour are usefully occupied by a few questions, put in Latin or Greek, and answered in Latin or Greek, that test whether the teacher's remarks have been assimilated. This plan affords an opportunity for grammatical drill. The numerals are quickly learned if the number of marks obtained be given to the teacher in the language that is being taught.

The following may be recommended as an occasional variation of the construing lesson. Let the teacher read or relate, in Latin or Greek, a simple story suited to the attainments of the class. If delivered in a lively manner the boys' attention is caught at once. Afterwards grammatical points may be explained. Finally, either the whole class can write out the story from dictation, or a few boys can be chosen to repeat it, in Latin or Greek, after the manner of the teacher. If the tale contains several characters, one boy can relate it as one character, another boy as another.

I am constrained to say a few words on the choice of authors, should these not be determined by the requirements of public examinations. Surely some weight should be attached to the interest a book has for the class. It may be heretical, but I venture to hold that Horace is unfit for young

pupils under, say, sixteen. Pleasure loving, lax in morals, praising virtue with a mean desire to please Augustus, Horace cannot be called an attractive character. Certainly he does not attract schoolboys. As a stylist, of course, he is supreme, but I venture to believe that not even his style outweighs the objections against him. Vergil is different. Boys like the Aeneid and its story of wonder and adventure. Lucretius has some claim as a school author. He must, indeed, be read in extracts, but his Latin is good and fairly easy to translate. Being manly and sincere he attracts boys, as I found out by accident. With secret misgivings I decided to read with a class of boys about fifteen years old a book of selections from Lucretius. To my surprise the poet was appreciated and enjoyed. Livy is a good model for Latin prose, and interests boys more than Cicero. In spite of his difficult vocabulary, Aeschylus will prove more attractive to boys than either Sophocles or Euripides. The last, as a rule, they detest. The "Memorabilia" might be studied more than it is, if only for the sake of the excellent pictures of Greek life and manners presented by the Socratic talks.

Every teacher cherishes a few aspirations, although the limits of the time-table, and a natural reluctance to wander too far from the beaten track into the wilderness of fads, cause him to hesitate before advocating what may turn out in the end impracticable. But even an impossible ideal may impart life and increased efficacy to the humdrum routine of the class-room. I believe, for instance, that it is want of time, more than any inherent incapacity of boyhood, which prevents the teacher from forming in any but a favoured few the habit of constantly asking, "Wherein lies the beauty of that passage? Could I have expressed myself as well as Vergil, or Cicero, or Sophocles has done here? If not, why not? Where is my deficiency?" The late Prof. D'Arcy Thompson, in his stimulating work, "Daydreams of a Schoolmaster," relates that he translated the whole Aeneid to his class, portion by portion, after the day's lesson. These scholars, he adds, were probably the first boy-mariners to circumnavigate Vergil's splendid poem. If it were only possible now! "Daydreams" contains many noble ideals, rarely capable of realisation in ordinary schools, which are always the aspirations of a mind devoted to duty and brimful of sympathy for child-nature. And perhaps these qualities stand for more than all the schemes and methods that the wit of man can devise.

To set a boy down without any preparatory help to translate an author like Caesar is like expecting him to grope his way through an unknown town in the dark, without giving him any clue as to the main streets. If a boy is set to prepare a passage from Caesar or Nepos by himself, his first idea, as a rule, is to make a list of the words he does not know, to look them out one by one in the dictionary, taking that meaning which happens to strike him first, to enter all these on his list, and then by the help of this list to try to puzzle out the meaning. No conceivable course could be more fatal to success.—J. L. Paton.

LANDMARKS OF CLASSICAL ARCHAEOLOGY, 1899-1902.

By J. L. MYRES, M.A.

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THE object of this note is to enumerate some of the principal points of classical study, in which recent archaeological discoveries have justified changes in the interpretation of classical texts, or a change of standpoint in the treatment of historical or antiquarian topics. To summarise even in outline the actual results of recent travel or excavation would be impossible within the limits assigned; and even so, many important pieces of work are necessarily passed by the results of which are either still difficult of access, or would involve long preliminary explanation. For reasons which will be painfully obvious to those most concerned, I confine myself, wherever that is possible, to publications in the English language.

In the first place, much has been done on broad general lines to familiarise classical teachers with the results of classical archaeology. It is not merely that classical sites are far more easily visited than even four or five years ago; that the results of excavation are on the whole more promptly published and better illustrated, or that the mechanism of illustration, by casts and models, by large-sized photographs, and (above all) by lantern slides, is many times more copious than formerly. The noteworthy feature rather is, that, as in other departments of education, a distinct move is perceptible in the direction of broader methods of teaching, and a more frankly naturalist and humanist treatment of classical texts and topics, which may, with good luck, go far to put classical studies on a fairer footing of comparison with the newer subjects in which the ancient ways of teaching were not quite so deep-rooted as here.

Among these general studies a foremost place should be given to Prof. P. Gardner's brief essay on "Classical Archaeology in Schools," prepared by request of a committee of the Headmasters' Conference, and intended as a review of the conditions under which archaeological teaching of any kind is practicable in public schools. By request of the same committee, the essay is furnished with an appendix containing lists of archaeological apparatus; which is the first step towards a directory of such aids, and quite supersedes the "Teachers' Guild Museum Catalogue" of 1896.

More directly instructive in its scope, written and edited with experience and discretion, and practically complete down to the year of publication, is the volume of essays entitled "Authority and Archaeology Sacred and Profane," of which the introduction (by the editor, Mr. D. G. Hogarth) deals with the general characteristics and the relative value of archaeological and documentary evidence; while the sections on Egypt

and Assyria, Prehistoric Greece, Historic Greece, and the Roman World deal, in effect, with the archaeological commentary on Herodotus, Homer, the Tragedians, and the Roman historians respectively, and will form a convenient *terminus a quo* for the present survey of subsequent additions to our knowledge.

For Greek history, one brilliant attempt to focus recent inquiry, on the strictly historical side, is provided by the recent "History of Greece" of Prof. Bury, the copious footnotes to which, particularly in the second (library) edition, form almost an inventory of the more recent work in this kind. The survey of "Archaeology in Greece, 1889-00, 1900-1, 1901-2," in the corresponding volumes of the *Journal of Hellenic Studies*, will give a clue to the principal excavations and their results; and more elaborate abstracts of recent work are printed quarterly in the *American Journal of Archaeology*; while for the history and civilisation of the older nations of antiquity the cautious and weighty articles on "Babylonia," "Assyria," "Egypt," "Phoenicia," and the like, in the new "Encyclopædia Biblica," are at the same time brief and accessible enough to be recommended to classical teachers here.

For Roman matters there is at present nothing at all analagous, a state of things for which the growing tendency, in England, to restrict Roman history to the study of purely political and constitutional problems is more than anything else responsible; but the publication of a first instalment of work from the newly-established School of Archaeology in Rome is perhaps the earnest of reaction in a more liberal direction.

Turning now to more detailed matters, the most extensive and at the same time the most novel discoveries of the years under review belong to the prehistoric period of Greece, and result directly from the opportunities afforded, at last, for regular excavation, by the pacification of Crete after its revolt in 1897-9; for now at last it is possible to test with the spade both the classical tradition of the thalassocracies of Minos and Idomeneus, and the recent speculations which inferred, from the scanty surface-finds and other more general considerations, that Crete must have been a very important centre of culture and enterprise during the "Mycenaean" phase of the Aegean Bronze Age.

The brilliant discoveries of Mr. Arthur Evans in the Minoan Palace at Knossos; the smaller but hardly less instructive undertakings of the Cretan Exploration Fund at the Dictæan Cave, and at Zakro in Eastern Crete, and of the British School of Archaeology at Praesos and Palaeokastro in the same "Eteo-cretan" neighbourhood; and the excavation of another palace at Phaestos by the members of the Italian Mission, have been published in broad outline already, and the British results in some detail (*British School Annual*, vi., vii.); but the final publication of so large a mass of material must necessarily be delayed for some years. Enough, however, has been announced already to justify a brief comparison of our know-

ledge of pre-historic times in the Aegean, before and after the work of the period 1900-1902.

In the first place, much light has been thrown on the duration and rate of progress of Aegean civilisation. The discovery of a really Neolithic settlement, below the Bronze Age stratum at Knossos, gives us—what Hissarlik itself never fully gave—a picture of Aegean culture before the introduction of metals at all, and a cultural *terminus a quo* from which to plot out the succeeding stages onwards. Contrary, moreover, to the view which has prevailed for some years, even at this early stage Mr. Evans thinks that he can trace already the influence of Babylonian art-forms in the rude marble images which abound in this early stratum.

Secondly, much new evidence has accumulated in favour of the contemporaneity—already widely accepted—of the culminating epoch of Aegean culture with the eighteenth dynasty of Egypt, covering the period 1500-1300 B.C., while the probability increases that an earlier stage of peculiar prosperity corresponded with the twelfth dynasty of Egypt and the twenty-fifth and following centuries B.C. On the other hand, no counterparts have as yet been discovered within the Aegean basin itself to the so-called "Aegean" objects from the tombs of the earliest Egyptian kings of 4000-5000 B.C.

Thirdly, the wreckage of the Palaces of Knossos and Phaestos show that the "Mycenaean" régime in Crete fell politically into abrupt collapse about the end of the eighteenth Egyptian dynasty (*circa* 1300 B.C.); but the minor excavations show that, in the dark period which succeeded, Mycenaean traditions were very far from extinct in the Southern Aegean, and that Crete in particular recovered quickly from the worst stress of the *débâcle*, and maintained a prosperous though not a conspicuous career down to the margin of historic times.

Fourthly, in particular, the Cretan system of writing, which is perhaps the most remarkable of all the discoveries in detail, seems to have maintained itself in renewed vigour down to, if not beyond, the moment of the catastrophe; while the old Cretan language—still, like the Script itself, unread—is now known, from the discovery (at Praesos) of parts of a considerable inscription, to have remained in regular use not merely into the sixth—as was known before—but even into the fourth century B.C.

Fifthly, the Script itself, on further study, proves to present more numerous sub-varieties and closer relationships, in its later phases, with the alphabetic scripts of historic times, even than was believed at first. On the other hand, many of the symbols of the actual Greek alphabet are now known to have been in use, in some kind of notation or other, before the destruction of the Knossian palace. The probability is therefore greatly increased that the Greek alphabets will prove to be members of the same group as the Knossian signaries, and more nearly related to these old Aegean scripts than to their Levantine or Phoenician counterparts.

More directly bearing upon the perennial Homeric Question are the new notes and appendices contained in the second edition of Dr. Leaf's commentary on the "Iliad" (Books i.-xii., 1901; xiii.-xxiv., in the press) and in the long-expected edition of "Odyssey" xiii.-xxiv., by the Provost of Oriel. The latter contains, in particular, a review of the evidence as to the construction of the Homeric house (with which compare the paper on "The Homeric House and its Mycenaean Analogies," in J.H.S. xx. 128 ff.); and the former a discussion of the relation of Homeric to Mycenaean armour, which anticipates the publication of the second edition of Reichel's "Homerische Waffen." This question of Homeric armour is also one of the corner-stones of a stimulating but often paradoxical book on "The Early Age of Greece," by Prof. Ridgeway (of which only the first volume has appeared as yet); and seems likely to give rise to further controversy in the near future. The problem arises from the interpretation of a large mass of Homeric phraseology in terms *either* of Mycenaean armour (with bronze sword, flexible leathern shield, and no breastplate, and only rarely greaves); *or* of the later Greek "hoplite armour," with iron sword, rigid bronze shield, bronze breastplate and greaves; and its importance arises from the probability that in either event the poet is describing a contemporary type of armour, so that to identify the type of armour is practically to fix the place of the poems in an *archaeological* series in which certain fixed points have an approximate date.

Another Homeric question which may at any moment become acute is that of the place of the Homeric dialect in the history of the Greek language; for in the same book Prof. Ridgeway has thrown down a challenge the issue of which must mainly depend upon the decipherment of the Knossian script, and on the evidence which this may afford as to the late or early spread of the Greek language in the Aegean.

Quite another line of investigation which also bears upon Homeric matters is that opened up by Mr. Arthur Evans in his paper on "Mycenaean Tree and Pillar Cults" in J.H.S. xxi. 99 pp.; for his conclusions raise at once the whole question of the source and date of introduction of the Olympic religion in the Aegean, of which practically not a trace appears as yet on Mycenaean monuments. And here perhaps reference should be made once more to Prof. Ridgeway's book, in which the ancient problem as to the significance and history of cremation is restated at length from a fresh and ingenious point of view.

Turning now to historic Greece, we should note, in the first place, the advances made in topographical research both by surface survey and by exploration. First as to maps. Kiepert's "Formae Orbis Antiqui" continue to appear at intervals, in spite of the death of their original editor; but for most students the "Handy Classical Maps" edited by Mr. G. B. Grundy (Murray, 1901) will probably take their place, being well up to date and far less crowded with practically useless detail.

Second, as to detailed surveys: Mr. Grundy has

followed up his studies of Plataea and Sphacteria with an elaborate survey of the neighbourhood of Thermopylae, which is published, along with a re-statement of his Plataean work, and of his views as to Salamis and Artemisium, in a substantial volume "The Great Persian War" (Murray, 1901), which forms an elaborate political and strategical commentary on Herodotus. The book, however, contains a good deal else besides the new topographical material, and direct exposition of the meaning of it all.

Thirdly, as to excavation: much work has been done on the north, and more recently also on the west side of the Akropolis of Athens, which contributes to modify earlier views as to the grouping of monuments in this quarter: but nothing has been found as yet to compare in interest with the results on the south side, or with the German diggings below the Pnyx. The French excavation of Delphi is practically completed, but the publication of the results is hardly begun: a book like Boetticher's "Olympia" would be invaluable at this stage, and should be quite easy to produce. The American exploration of the ruins of Corinth has identified the site of Pirene, and of the Great Gate of the Agora and other fixed points noted by Pausanias, but has not yet advanced far enough, on so difficult a site, to determine any great mass of detail. The German and Austrian work, on the other hand, at Priene, Miletus, and Ephesus, is revealing at last something of the magnificence of the great cities of Ionia, at least for the Hellenistic age: Priene in particular is perhaps the nearest counterpart to Pompeii in the Greek world.

Turning to minor monuments and illustrations of ancient life and art, special note should be taken of Prof. E. A. Gardner's paper on the "Greek House" (J. H. S. xxi. 293), which dispels (let us hope finally) the Vitruvian misinterpretations which have flooded the handbooks so long, and confronts us with the type of house (consisting of a *single* courtyard, on to which opens (a) a single reception-room, and also (b) all or most of the domestic apartments) which is actually revealed by excavation at Delos and elsewhere, and corresponds with Galen's "Farm," and other literary indications. For many matters connected with Greek religion and daily life, useful illustrations are supplied by M. B. Huish's "Greek Terra-cotta Statuettes," W. H. D. Rouse's "Greek Votive Offerings," and J. H. Huddilston's "Lessons from Greek Pottery"; and two valuable handbooks should be noted for more detailed reference—G. F. Hill's "Handbook of Greek and Roman Coins," and the new edition (edited by the last-named) of Hicks' "Manual of Greek Historical Inscriptions."

In Roman matters there is but little to record which bears upon the regular curriculum, for the mass of new work on frontier defence and on imperial organisation belongs to periods or departments which are not commonly studied in detail.

For students of Roman topography, the publication of Huelsen's "Formae Urbis Romae" marks a turning point of some practical importance; and the deep-level excavations in the Forum, the begin-

ning of a new era of exploration, involving a complete re-examination of old landmarks, and a good deal of re-adjustment of preconceived notions which it is perhaps too early yet to estimate. For details see the full summary in *Archaeologia* lvii. i., 125 pp., and the current reports from time to time in the *Athenaeum* and the *Classical Review*.

For Roman antiquities generally, note should be made of Mau's "Pompeii, its Life and Art," in an English translation; and of a very valuable little handbook of later Roman antiquities, Lowrie's "Christian Art and Archaeology."

SCHOOL FURNITURE AND EQUIPMENT.

WITH SPECIAL REFERENCE TO BOYS' SCHOOLS.

By J. W. JARVIS.

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II.—The Decoration of the Walls—Maps—Pictures.

NEXT to the desks, the wall is the problem of importance. What shall we do with the vacant spaces? As a rule, they are covered with maps, and these are covered with dust. But the strange thing is that, very often, far too often, the maps on the wall bear very little relation to the subjects in geography taught in that class-room. It is so easy to rearrange our syllabus and so very difficult to rearrange our scheme of decoration that the two very soon fail to march together, the habit of borrowing maps from each other's room soon becomes established, and the intelligent monitor rejoices in the free scamper it gives him when all the others are under control. Are maps really necessary as school equipment? Not so much now as formerly. Maps are much better in the hands of the pupils, and the value of the search for unknown places cannot be over-estimated. During the geography lesson the map and note-book should lie on each boy's desk, sketch maps should be drawn and diagrams copied, and the schoolroom map should be subsidiary to these.

As a rule, the sort of map required for the school-room should be that which takes in large areas of the world, as continents, oceans, &c.; maps which deal with comparatively small areas, as South Africa, are really not required. The smaller maps, such as those found in the more recent atlases, supply all that is wanted. That this point of view is rather lost is seen in the publishers' lists of new maps, where attempts are made to display to a class the details which should be in each pupil's hands. The maps which are most valuable to a class-master are those of oceans with their land fringes round them—that of the Atlantic is of first-rate importance in the teaching of history; and a

map showing the relation of England to the Continent ought to be exposed in every room. Besides these there should be, in prominent positions in the schoolroom, large-size maps of the world on Mercator's Projection and of Europe. These are to give a sense of the relationship of places rather than an accurate idea of their position, and most certainly no place should be mentioned without its situation being shown on a map. But maps are not always accessible; some are awkwardly hung at the back of the class and the board is on the easel; so there is nothing available just then, and a map swinging in mid-air on a map pole is probably the most awkward thing an earnest, energetic teacher has to deal with. We recom-

mend a map-stand (Fig. 1)¹ to be placed in every class-room: the base should be very heavy and the upright rigidly inserted in the base; the cost is about fifteen shillings. It is a mistake to provide easels for maps, they are wanted for blackboards. An ingenious map-elevator (Fig. 2) has been patented by Messrs. Philip and Son, which takes up very little room, and, provided that there is no cross lighting, is most useful for hanging in front of a class. It can be managed by boys, and this is in its favour (Fig. 3). A map pole at least six feet long should be hung in a convenient corner near the door and always kept there when not in use. Wall atlases (Fig. 4) are becoming common. These consist of a number of maps arranged in some geographical sequence

¹ From the catalogue of the Educational Supply Association, Ltd., Holborn Viaduct, London.

and fastened together at the top. As each is used it is thrown over and the next in order appears. The price varies from 12s. 6d. to 25s. according to the number of sheets, and as a rule they are clear, distinct and adapted for class purposes. But the boy on the back row comes off very badly after all, so perhaps we had better agree to place the map in each pupil's hand and to use a few large maps to indicate general positions and nothing else. For teachers' sketch-maps brown paper and coloured chalks are invaluable. The brown paper can be folded up and carried home easily, and any material which can be worked at home and brought to school is welcome to the teacher. If folded carefully, brown paper does not smear. Charts and printed tables are neither economical nor desirable. They fade and soon look shabby, and as a rule they are so crowded as to be useless. Before me lies a chart on the metric system, four feet long by three and a half feet broad, and it guarantees to contain the whole of the facts relating to that system, together with pictures of the barometer

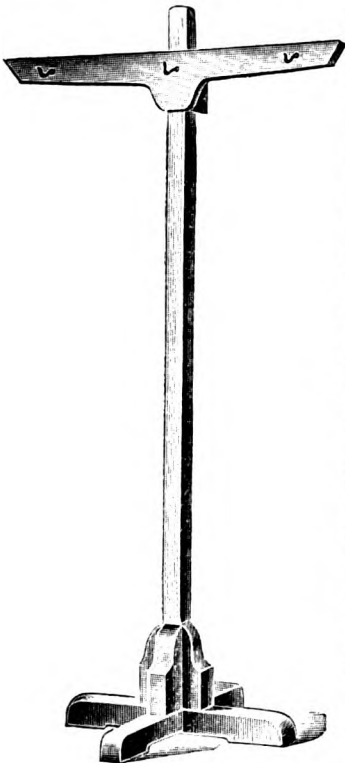


Fig. 1.

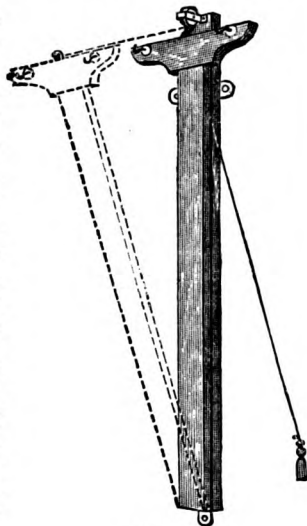


Fig. 2.

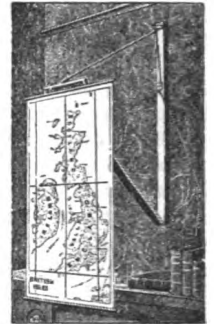


Fig. 3.

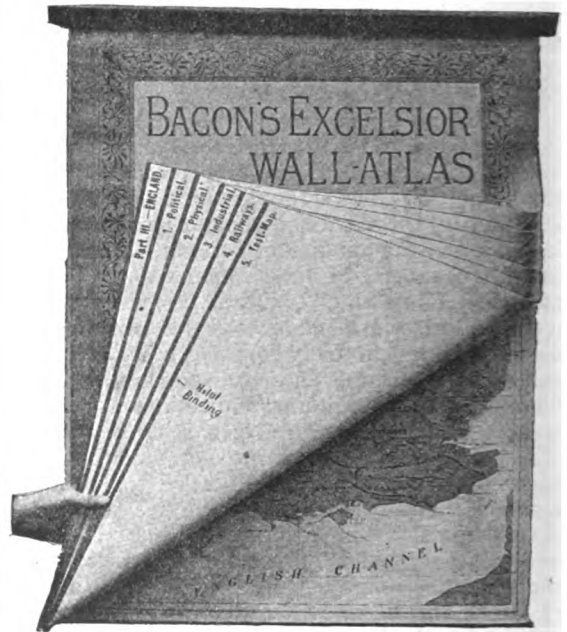


Fig. 4.

and thermometer and other useful notes. Apart from the fact that you cannot represent three dimensions by two dimensions, nor length by showing surveyor's chains tied up in bundles, the chart is useless because it is overcrowded. All these appeals to the eye are much better drawn by the teacher, and should only be arranged to last a term or at the most a year's service. But the length of a metre and a yard might well be placed side by side on the school wall in a broad band of

coloured paint; a square yard and a square metre should be painted on a school wall and the yard be divided into square feet and the metre into square decimetres. An interesting device is to have a board standing vertically fixed to the wall with feet and inches marked on one edge, and a metre, decimetres and centimetres marked on the other, so that the pupils can by standing against it measure each other's heights in the terms of both systems. The latitude and longitude of the town in which the school is situated ought to be distinctly painted over certain of the doors, and the length, height and breadth of the rooms should be conspicuously marked in order that the pupils may have a standard of comparison firmly fixed in their memory.

The great enemy of our wall maps is, however, dust, and many a teacher shrinks from using them because of the dusty condition in which they generally are. Then let us have very few on the walls, all hung so low that the pupils can easily see them as they pass along—nothing skied—and let them be cleaned and dusted at least weekly, if not daily.

The most charming decoration is of course pictures, and the work of the Art for Schools Association in providing excellent engravings cannot be too highly commended. Good pictures only should be exposed to the pupils' gaze, and an occasional word from the teacher on the beauty of the execution and a warning comparison with the photographic rubbish so common in our illustrated papers should be made. Because a picture is cheap is not a good reason why it should be hung in a schoolroom, and why advertising pictures are ever allowed on school walls passes comprehension. The elementary schools in the country have been hopelessly vulgarised by them, and the decoration of the rural infants' schools is very frequently a scandal to the management. Cannot a picture-circulating scheme be devised, if not of valuable pictures, at least of good illustrations and models to which the attention of our scholars could be drawn? And attention must be *drawn*. The amount of eye blindness in town children, coming in contact with so much variety and with such a stream of life, is only known to those teachers who attempt to draw their illustrations from the common experience of children. Children will pass pictures, models, sketches for days together without stopping to look at them or evincing the slightest interest in them unless they move, and to very few it is given fully to know in what the charm of a picture lies. This hidden charm needs to be pointed out—not entirely but suggestively, and so a lesson on the pictures in the room should be given at least once a year. In connection with this is a delightful practice which prevails in one of the best secondary schools in London. A statue of the foundress stands in marble in the entrance hall, and once a year each class is marshalled in front of the figure and the headmaster tells the story of her narrow escape from death and how she in humble gratefulness ever after devoted her life and means to education. Such lessons are

never lost, they carve deep channels in a boy's memory and inspire him with respect for the past, which is one of the solemnising influences of mature life.

Another practice which may be commended is that of hanging on to the wall a picture frame with a movable back made to take a picture the size of a sheet from the *Illustrated London News*, the *Graphic* or the *Sphere*. These periodicals very often contain sketches of considerable educational value which are worth preserving. On the notice board they become dusty, pinholed, or torn; but they are easily inserted in a picture frame and may be removed and put away for use another time. In one school the drawings from the *Builder* appear weekly, and in another the best-drawn piece of apparatus is exhibited monthly.

A sloping desk with a ridge (Fig. 5) is seen

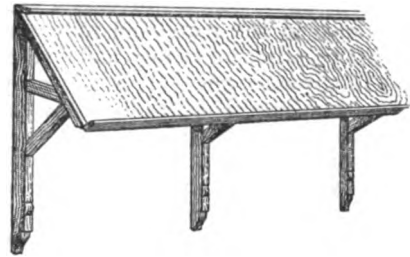


Fig. 5.

attached to the walls in rooms where the boys assemble in common. On this, drawings, newspaper cuttings or sketches, are placed, and these are always interesting to a certain section of the scholars. It is well to remember that indirect influences have great value in education and that the same influence does not appeal equally to all. The greater the variety of illustrations the higher the general level of intelligence will be, and so we must spread our nets widely in view of the many diversities which boys' minds present to us.

The globe and its management is a source of great difficulty in schools. It is an expensive article; cheap globes—flimsily made, insufficiently supported, or on too small a scale—are absolutely worthless. Yet a globe is a real necessity if a child is ever to obtain a clear notion of the world. Unfortunately globes do not lend themselves to class teaching and so they have fallen into desuetude. This is greatly to be regretted, and it is to be hoped that, now children are to be started on the voyage of discovery by themselves, they will be encouraged to study the globe and to work out the more simple problems of measurement and time as a pleasant and interesting occupation.

(To be continued.)

IN German schools "there appears to be a great lack of the modern schoolroom appliances . . . I have reference here to appliances which contribute to comfort, and such as are mechanically easily adjusted, &c. Their maps, charts, models, 'anschauungs' material, &c., are usually very good and often excellent, but all lack that quality which we should term 'handiness.'"—Dr. F. E. Boltcn.

MATTHEW ARNOLD.¹

By SIR JOSHUA FITCH, M.A., LL.D.

THIS is a valuable book on a very attractive subject. Its author truly says that among English-speaking people "the reputation of Matthew Arnold widens and will widen as knowledge and the love of books spread through all classes of society." Mr. Herbert Paul is well qualified by scholarship and by personal sympathy to write a biographical estimate of Arnold, and his book is characterised by the wide knowledge, the literary insight, and the charm of style with which the readers of his many miscellaneous writings in our leading reviews are pleasantly familiar. It is, however, an unequal and somewhat unsatisfying book, and will scarcely add much to Mr. Paul's high literary reputation. There is a lack of plan and coherence in the facts and judgments which are brought together here, just and acute as many of those judgments are. It is not easy for the reader to trace here the gradual development of Arnold's genius, or to discern Arnold's true and permanent place in the several departments of literature—lyrical, descriptive, critical, argumentative—serious and playful—in which he from time to time employed himself. Mr. Paul has a genuine appreciation of Arnold as a poet, but he frequently pronounces unequalled praise or blame as the result of purely subjective and personal impressions, without any attempt to verify those impressions by reference to any intelligible standard of excellence or canon of good taste. He tells us Matthew Arnold "reminded or informed the British public that criticism was a serious thing, that good criticism was just as important as good authorship, that it was not a question of individual taste, but partly of received authority, and partly of trained judgment." Yet he points out that in a few cases Arnold's estimate of contemporary writers was coloured by his own prepossessions, and was therefore inadequate or unjust. None of us are concerned to dwell seriously on this point. For, in truth, it is just as interesting and quite as edifying to know the impression which the writings of one gifted author have left on the mind of another as to learn how far those impressions conform to some recognised and orthodox standard. Nevertheless, Mr. Paul is hardly entitled to complain. For some of his own preferences and dislikes are expressed *ex cathedra*, and will appear to the ordinary reader as unverified, and not quite intelligible. He prefers "Mycerinus" to "Empedocles"; and thinks that "to criticise 'Merope' is to dissect a corpse"; but he fails to give adequate reasons for his preferences. He is severe on some of Arnold's metrical experiments; and has evidently not been able so to attune his ear as to derive pleasure from the unrhymed trimeter with which the "Youth of Nature," "Heine's Grave,"

and "Rugby Chapel" have made us all familiar. No doubt the liking for this metre is an acquired taste; but those who have acquired it have learnt to detect in these poems harmonies which are not only musical to the ear, but especially appropriate to the grave and meditative character of the subject itself, and to Arnold's poetical treatment of it.

In his estimate of the prose writings, Mr. Paul is on surer ground. Those writings touched closely the social condition of the people, the functions of government and some burning political questions, as well as the educational interests of the community, the prospects of literature, and the intellectual progress of the age. On all these subjects much has already been said by such competent writers as Mr. John Morley, Mr. Frederic Harrison, Mr. Watts-Dunton, Mr. Birrell, Dr. R. Garnett, and Mr. George Russell. But by none of them has a fuller and more skilful summary or a juster estimate been formed than is presented in Mr. Paul's book, which is fully entitled to a high place in Messrs. Macmillan's *Walhalla*, "English Men of Letters," and will generally be recognised as one of the ablest, most generous and most trustworthy contributions to that excellent series of monographs.

The least satisfactory part of the book is that which concerns Mr. Arnold's services to education. He is quite rightly represented as having made in his official reports some wise and most practical additions to educational literature; and his genial kindness to teachers and scholars in the schools which he visited is justly recognised and praised. But it is not accurate to describe him as "the real father of university extension." I have been unable to discover any evidence in his writings or speeches of any actual furtherance or help he gave to that movement, and I have no reason to suppose that the peripatetic lectures of the young university men in our provincial towns were efforts which were specially congenial or interesting to him.

Nor is it a fact that he is to be identified in any way with the reform of the University of London. He did indeed often advise the more promising of the young schoolmasters to read for a London degree, that being the only form of distinction then open to self-taught students; and he could not but remember the part which his father had taken, as one of the earliest members of the Senate, in 1838, when he vainly urged upon his colleagues the introduction of a scriptural examination into the requirements of an Arts degree. But there is, as far as I know, nothing to show that Arnold ever took any part in the long controversy which resulted in the re-organising of the University, or that he followed the fortunes of that institution with any special interest.

Mr. Paul's information, also, on two or three points relating to foreign education is sometimes incomplete and a little misleading. For example, he says, p. 108: "No one in England was taught to teach, whereas in France the State made itself directly responsible for all kinds of education, and

¹ "Matthew Arnold." By Herbert W. Paul. viii + 188 pp. English Men of Letters Series. (Macmillan.) 2s. net.

the most stringent tests were applied to teachers." This is a statement which Arnold himself would certainly not have accepted in so unqualified a form. For he had the best reason for knowing what was done in the fifty training colleges inspected by the English Education Department; and for recognising the fact that from the first constitution of that department the possession of a certificate of professional competency granted after examination has always been insisted on as a qualification requisite for a schoolmaster or mistress in an aided school. Again, Mr. Paul says: "Examinations, Mr. Arnold held, were better understood in France than here. . . The French did not attempt to examine boys before they were fifteen, and he held very strongly the opinion that before that age intellectual pressure was dangerous." But, in fact, there is in France, and has been since 1836, a highly organised system of examination, conducted under the authority of the Government, applicable to primary schools, and open to all scholars over the age of eleven. The successful candidates receive a formal diploma—*certificat d'études*—which is greatly prized as an attestation of a scholar's proficiency in school, and as a passport to honourable employment. In 1897 there was a total of 236,859 candidates for this certificate, of whom 186,035 (101,309 boys and 84,726 girls), or 78.5 per cent., were successful in obtaining it.

On another point of more importance it seems needful to put in a *caveat*. Mr. John Morley has said that Arnold was "disappointed in some reasonable hopes and anticipations;" others of his friends and admirers have described him as one whose merits were overlooked by the Government, and particularly by Mr. Gladstone. Mr. Paul speaks of his failure to obtain a Charity Commissionership as a "disaster to the public service" which "may almost be called a scandal." The feeling thus expressed is generous, and, from one point of view, quite defensible. But there are other considerations which need to be borne in mind. The relations which ought to subsist between a Government and an exceptionally gifted public servant are not easy to define, and the most appropriate form of promotion in such a case is not always readily to be found. The problem which presents itself to statesmen who have patronage to dispense—how to recognise the claims of genius and at the same time to secure the efficiency of the public service—is not very simple. It was not well solved when Burns became an exciseman or Wordsworth a distributor of stamps. It would not have been well solved if Arnold had been appointed a Charity Commissioner. For the Charity Commission is a legal body, entrusted by statute with the primary duty of investigating and interpreting deeds of foundation, of settling questions in respect to the management of property, and of framing schemes in accordance with the Charitable Trusts Acts. For the purpose of administering these Acts, the Commission has certain judicial powers, and serves in fact as a Minor Court of Chancery. Special legal training and experience

are obviously needed for the right discharge of these delicate functions. On two occasions in Arnold's life a vacancy occurred in the Commission for which he was induced by his friends to become a candidate. The first of these was in 1866, when Lord Russell was Prime Minister. This was eight years before the administration of the Endowed Schools Act was entrusted to that Commission, and when the opportunities it possessed for influencing public education were very small. Mr. Arnold himself evinced no consciousness of grievance when another appointment was made, for in a letter to his mother (March 10th, 1866) he says: "I believe a lawyer is thought necessary for the place and very likely this is quite right, and I believe they have a remarkably good lawyer offering himself." I know of no evidence in support of Mr. Paul's conjecture that Mr. Gladstone influenced Lord Russell in making this appointment, or that at that date any writings of Arnold's would have justified Gladstone's interposition. "Culture and Anarchy," "St. Paul and Protestantism," and "Literature and Dogma," were not written till long afterwards.

The second case occurred in 1882, when Arnold was about to retire from the inspectorship and when he and his friends were anxious to find some means of augmenting the diminished income of two-thirds to which he was entitled as a civil servant. It was an unfortunate coincidence that at that moment a number of the supporters of the Government were approaching the Prime Minister with a special request that a Nonconformist should be appointed to the office, seeing that there was a prevalent, though ill-founded, belief in the Liberal party that the Commissioners in the passing of their educational schemes had been unduly favourable to the Established Church. Mr. Gladstone, of course, resisted this pressure; he knew well the best traditions of the permanent service of the State, and his high sense of public duty always rebelled against any exercise of patronage influenced by sectarian considerations. And in this case the post was offered to a skilled lawyer, of special educational experience and known impartiality, who was not a Nonconformist. But to have taken that opportunity to promote to the commissionership a man who was 60 years of age, who had no intimate knowledge of Charity law, and who had recently, in magazine articles, irritated the whole of the Nonconformist bodies in England by his half-playful and half-serious, but somewhat contemptuous references to dissent and dissenters, would not have been conducive to public policy. Nor would it have proved any real kindness to Arnold, to whom the unaccustomed duties and the application and confinement entailed by them would have been peculiarly distasteful, after the comparative freedom he had for more than thirty years enjoyed in the arrangement of his own time and work. Mr. Gladstone found a more appropriate way of expressing his sense of the great, though non-official services which Arnold had rendered to the community. He offered him one of the very few literary pensions which it is in the power of the

Prime Minister to award. "To my surprise," writes Arnold in a letter to Mr. John Morley (August 10th, 1883)—

I have just had a letter from your great leader offering me a pension of £250 "as a public recognition of service to the poetry and literature of England." To my further surprise, those about me think I ought to accept it. . . . It seems to me that the fund available for literary pensions being so small, and literary men being numerous and needy, it would not look well if a man drawing already from the public purse an income of nearly £1,000 a year took £250 a year more from the same public fund available for pensions to letters, science, and art.

The reluctance and misgiving thus expressed were honourably characteristic of him, but he was over-ruled by the strong opinions of some of his wisest and most experienced friends, and he accepted Mr. Gladstone's offer. In fact, that offer was as creditable to the statesman on public grounds as it was personally acceptable to the poet. For it helped to make up the loss of official income which he would sustain by retirement, and it provided the needful means by having recourse to the one public fund specially designed by the Legislature for the reward of exceptional literary merit. And instead of imposing upon Arnold burdensome and inappropriate duties, it set him free to continue the work he could do best, and thus to render to the British public services which no other writer of his time could rival.

What those services were will become clearer to the nation as time goes on, and Mr. Paul's book will help to make them better appreciated. The readers of his pages will not recognise in Arnold the superciliousness and affectation with which he is occasionally credited by his detractors. They will see that there was a high seriousness in all he wrote; that, surveying our English life on many sides, he discerned in literature, in social conduct and manners, and even in the current views of religion and education, much that was ignoble and vulgar, which needed to be transformed and purified. He sought to make his countrymen perceive that there was a higher standard of living and thinking than had ever yet been reached, and to be uncomfortable until they had reached it.

To the apostolic counsel which in very different ways he never ceased to illustrate and enforce, "Covet earnestly the best gifts," he was wont to add, "Do not be content with anything short of the best, if you can find the best attainable."

This was a message to his generation which was greatly needed, and will be yet more needed in the days to come. Meanwhile we ought all to feel grateful to anyone who, like Mr. Paul, helps to make the figure of Matthew Arnold more luminous and interesting, and his teaching more intelligible.

THE great men of culture are those who have had a passion for diffusing, for making prevail, for carrying from one end of society to the other, the best knowledge, the best ideas of their time; who have laboured to divest knowledge of all that was harsh, uncouth, difficult, abstract, professional, exclusive; to humanise it, to make it efficient outside the clique of the cultivated and learned, yet still remaining the *best* knowledge and thought of the time, and a true source, therefore, of sweetness and light.—Matthew Arnold.

ARCHAEOLOGICAL RESEARCH AT ROME.¹

AS our readers are probably aware, a British school for archaeological students was founded two or three years ago at Rome, to do for Englishmen what the German, French, and American schools are doing for their countrymen at Rome or at Athens. Like all undertakings which have research for their end, this has to depend on private generosity, and has to compete on very unfair terms with foreign schools which are liberally subsidized by their governments; but, poor as it is (and its poverty is shown by an appeal in this very volume for a few indispensable books), the work done there, to judge from this firstfruit, may rank with the best. Rome, if in some respects less interesting than Athens as a centre, appeals to so many and diverse classes of scholars, and offers problems in so many branches of study, that we hope the income of the school will not long remain "less than £500," and much of that precarious.

Two papers are contained in this volume, each of a very special kind, representing unremunerative work, and one of them such as could hardly have been published at all in any other form. The first is by Mr. G. McN. Rushforth, the Director, and the second by Mr. T. Ashby. Mr. Rushforth is well known as the editor of "Latin Historical Inscriptions" and as a writer on Byzantine art, and has made a special study of Christian antiquities; and he came on the scene when the late excavations in the Forum had just unearthed the remains of a very early church. Here was a subject exactly suited to him; and he has produced a very careful descriptive monograph on the remains. The interest of these lies partly in the building itself, but chiefly in the wall-paintings which decorate it. The building stands over the remains of an earlier one, of which a large piscina can still be traced. The church itself is believed by Mr. Rushforth to have been originally a secular building. It has the plan of an ordinary Roman house, and this it may have been, or perhaps some part of the buildings which gave approach to the Palatine hill. Mr. Rushforth, following Duchesne, places the date of the church in the fifth century. As he acknowledges, however, this leaves its name, S. Maria Antiqua, unexplained. Mr. Rushforth, we think, attaches too much importance to the argument from silence. The greater part of the paper is taken up with the description and discussion of the paintings, which are of considerable interest and importance. The subjects are scriptural scenes, and the figures of saints and persons famous in local legend and in church history. One series represents the story of Quiricus and Julitta, and by an inscription the mysterious word *catomulevatio* is proved to mean the familiar "hoisting" of an offender. The pictures throw light on the costumes of the time, ecclesiastical and other, and the traditional representation of

¹ "Papers of the British School at Rome." Vol. I. x. + 285 pp. maps and plans. 12s. 6d.

saints, the use of the nimbus, and so forth. The artistic merit of the pictures may not be great, but more than one is important for its scheme. There is an old and good "Annunciation" (83). One "Crucifixion" shows the names of the figures inscribed, including the centurion Longinus; another shows the figure of Christ nude. "A Descent into Hell" follows a type, earlier and simpler than that of the general Byzantine treatment, in which only Christ, Adam, and Eve appear, with the figure of Satan under Christ's feet. In an interesting "Appendix" Mr. Rushforth deals with the representation of this scene in Byzantine art. We must express our admiration of the skill which has succeeded in identifying nearly all the subjects, and in tracing to their sources the inscribed quotations which accompany them.

Turning to the second paper, "The Classical Topography of the Roman Campagna," we are met with a subject of less general interest than the preceding, one which has been little studied and much needed investigation. A knowledge of the early road-system must, as Mr. Ashby points out, throw light on the early development of Roman power. The present study deals with three roads: Via Collatina, Via Praenestina, and Via Labicana, with the classical remains which lie beside them. This does not exhaust the subject, for the mediæval remains are left out. It would be impossible to offer any criticism in detail on the essay, which could only be checked by a specialist on the spot; but taking Mr. Ashby's care and accuracy for granted, we have a full record for the historian or archaeologist to use. The detailed maps deserve special praise. The paper is illustrated by photographs and plans, amongst which we may mention, as of special interest, pictures of old roads at Praenestina and Gabii, and a modern hut-village on the latter site. The resemblance of the huts to the ancient hut-urns is remarkable. There is also an angle of the old city wall of Gabii, published, we believe, for the first time.

AN EDUCATIONAL SURVEY.¹

MR. HUGHES has written a useful book which arranges for the general reader a mass of undigested facts scattered in great profusion about official and other publications, and gives us a good deal of sensible philosophy by the way. As the reviewer will have something to say in dispraise of the way in which the work is done, it should be understood that the good and useful qualities of the book itself far outweigh its bad style and *bêtises*. It bears witness not alone to Mr. Hughes' industry (he seems, poor man, to have read right and left), but also to a generally sane and well-balanced view in educational practice and politics.

His main idea is that which lies at the door of any serious approach to education—that the citizens of every country must be trained for national purposes with strict regard to national traditions, aptitudes, and character. For the purpose of showing us how the task is tackled in the greatest countries where national problems are being systematically treated, and where such things are of special importance because of the activity of mutual international influence, he places before us what he wishes to be pictures of the existing educational conditions of England, France, Germany, and America. This comparative study is a very valuable corrective of the one-sided opinions formed by an "intensive" study of any one system, to which the writers of essays are very prone. Mr. Hughes has read the essays, and he has in many cases supplemented his studies by making a first-hand acquaintance (not always very considerable) with the things he describes.

He is often as just in his generalisations as he is temperate in his statement; as, for instance, when he praises the loyalty of the Germans to true education. "Neither the clamour of the specialist nor the cry of the market is able to divert them from their task. . . . It is now acknowledged that no schools in the world give a better commercial training than the *Realschulen*, although no commercial subjects are taught in them." Or, in his characterisation of the French system. "It is logical, it is comprehensive, and for the purpose set before it, it is efficient. . . . The school is turning out French citizens of the type needed by the Republic; whether that type is the best fitted for life is another matter." Or, as a curious and most significant point of contrast. ". . . The State helps the rural more than the town school in both Germany and France, and occasionally in America. In fact, the States endeavour to help those who need help most. The English plan has been to help those who need it least."

He is not less happy in his use of statistics. Where he propounds them he also explains them; so that one need not ignore them on the grounds perfectly justifiable in the case of some official figures of which we have acquaintance: that, originally desired for some temporary use, they now stand, like the forgotten sentinel, to mark a spot once sacred to the interest of (not a queen but) a member of parliament.

The survey which Mr. Hughes' plan constrains him to make leads him necessarily to cover, or at least to touch, a great deal of the ground occupied by public solicitude in these days that are. The question of the general organisation of education and its relation to general politics is of the utmost moment in any comparative study. Few things are more significant of national ideals or point of view than these. Our grandchildren will not understand the histories they read unless a proper place is given to the discreditable controversy raging in our midst, ostensibly in defence of "religion" on both extremes, but really in maintenance of social and political prejudices. Again: if we would know to what purposes, intellectual or

¹ "The Making of Citizens." By R. E. Hughes. (Walter Scott Publishing Co.) 405 pp. 6s.

moral, this and that country deliberately direct their farthest hopes, the student cannot but examine carefully the curricula of their schools, ages of school attendance, facilities for access to schools, annual expenditure, cost "per child," and so forth. On these matters and their like Mr. Hughes gives us just what we want, and his book should be read and pondered.

But we cannot congratulate him without serious reservations. He is by no means always safe in his generalisations, especially in the earlier part of his book, where he is talking at large. He has no right at all, for instance, to say that in England the "classes" other than "the poor" prefer to send their children to "academies for the sons of gentlemen," or "schools for the daughters of gentlemen." Some, a very small minority, no doubt do; and, besides, such institutions are comparatively rare. And nothing but Mr. Hughes' ignorance of English rural schools can excuse (if indeed it can) such a flagrantly inaccurate statement as that "the management of the Church of England schools is vested in a committee of which the incumbent is generally the chairman—sometimes the only, and *always the most active member.*" Nor is it at all true that "all the English residential training colleges are private institutions," in any sense, at least, in which the word "private" is likely to be understood.

And occasionally he manages to get into a given limited space an amazing pemmican of tall talk and clap-trap. "*Democracy*," he says, "is impossible in a school where the classics reign supreme. Nothing develops the *critical attitude* as much as a *scientific training*. *Linguistic training* generally cultivates an attitude of *dependence*; *scientific training* challenges *authority*." Every one of the terms which we have ventured to underline is woefully ambiguous; and to make it worse, Mr. Hughes, who is really, we divine, a "humanist," on the whole, adds that "both attitudes are in some respects extreme and objectionable." Any "attitude" can be made "extreme" by the careless use of words; and we have observed that speakers and writers on education are much given to this kind of extravagation.

And talking of words, Mr. Hughes, who usually writes with lucidity and point, is often guilty of strange English. "It will be *nil*" can hardly be defended. And what is a "primal" duty? And what miracle of nature is darkly suggested by "the revolution in the sex of the teacher?" And why is England on "the other side of *La Manche*?" And where are the schools in which "*dogmatic religious teaching is taught*"? And why does the German schoolmaster, instead of teaching gardening, "initiate" his boys and girls "into the mysteries of gardening"? . . . Oh, these neglected linguistic studies! those attitudinarian extremists!

It is high time we dropped these controversies about words. Let us leave the drums and bagpipes to those self-appointed champions who proclaim all opposition to their summary views insensate. We want what Mr. Hughes thoroughly

well appreciates—an integral education; and if the intelligent reader will draw his pen through a few misconceived and misshapen paragraphs of Mr. Hughes' book, he will read it again without finding anything that is not, in some degree, helpful and stimulating in this very direction.

We have one shaft more in our quiver. Mr. Hughes owes us a reasonably full index; the one he gives us is an affront to the enquiring mind.

LESSONS FROM GREEK VASES.¹

CONSIDERING the interest and artistic quality of Greek vases, it is surprising that so little has been done to make them accessible to the non-specialist. The collections of reproductions are very expensive (excepting Reinach's cheap *Répertoire*), and books dealing with their subjects and interpretation are few and incomplete. The fact is, scholars have hardly touched the subject, whilst archaeologists have been more concerned with the technique and chronology than with anything of broader interest. We still await the standard work which shall sum up in due proportion our knowledge of Greek pottery. Mr. Huddilston does not attempt this task; he is less ambitious, and desires rather to indicate what can be got from vases, and to guide the student who wishes to go further. The body of the work is addressed to readers who know nothing of the subject. It is tantalising, because so many interesting things are said, and so few illustrations given; but, we take it, Mr. Huddilston meant to be tantalising.

The variety of subjects which are illuminated by the vases is very great. There are, to begin with, the material adjuncts of civilisation: houses and furniture, dress and arms, and so forth. Then there is custom: marriage and burial, education, trade and profession, pastimes and sports, the daily life in the household. Light is thrown also on the early history of Greece, on the distribution of power and of trade. From the same we get useful illustrations of plastic art and of painting, of literature and the drama, and, above all, of mythology and religion. None of the last group of subjects have yet been properly worked up, although there are many special essays on one point or another.

Mr. Huddilston covers the ground fairly well. In details he often shows lack of knowledge; as when he lays down that writing was unknown in Greece for literary or ordinary use until about the eighth century B.C.; or suggests that the vase of Phanes found at Naucratis may have been broken up in anger when he turned traitor—think of the dedicators at Delphi, from Croesus to Phryne! or again, when he refers the Miltiades vase to the

¹ "Lessons from Greek Pottery." To which is added a Bibliography of Greek Ceramics. By J. H. Huddilston, Professor of Greek in the University of Maine. xiv. + 144 pp. With illustrations. (Macmillan.) 5s. net.

younger Miltiades. We do not know whether to consider *palaestrae* for the singular (40) or *mina* for the plural (58) as misprints or mistakes. It is unfortunate that, like so many of our cousins over the water, Mr. Huddilston has no feeling for English style; else he would hardly say that nothing has been so "largely recovered" as vases; or use words like "hippic," "necropolises," and phrases like "by the hundreds." The word "not" seems incorrect in one place (p. 44, line 10); and in another, "from the lost to the extant" should be reversed (27). Two points are well brought out: the popularity of lyric poetry as against dramatic, and the relation of vase-paintings to the question of a Greek stage. We may add another, known only from vases: that music accompanied the athletic exercises at the Games. As to the illustrations, they are most interesting; although we cannot see why two plates are wasted on general views of vase-rooms in the British Museum. We think room might have been found for the graceful picture of the "First Swallow of Spring."

So much for the general reader; but the bibliography appeals to the more serious student. It is in fact the best bibliography on the subject which we know, and represents a long period of research, seeing that the articles referred to are scattered about amongst a variety of periodicals which are only to be found in a few libraries. The bibliography alone is worth the price of the book.

awaited. It needs knowledge to distinguish Ichneumons and other insects that also emerge from galls from the real inhabitants. The insects are instantly killed by letting them fall into boiling water or into the fumes of sulphur. Every species should be carefully labelled.

Plant Life.—The leaves of trees will have fallen in the following order:—Ash, Maple, Poplar, Birch, Elm, and Oak. The fruits of the Hawthorn, Holly, Mountain Ash, Spindle-wood, Rose, &c., may be studied, and the structure of the different kinds of timber.

Geology.—During the leisure of the dormant months, and when the ground is more exposed, and the leafless trees allow the contour of the landscape to be better seen, geology, both in its details and its larger features, will prove attractive. Walks along the sea-shore are very productive after a storm. Wet days may be profitably spent at a museum or with a naturalist.

Folk-lore:—

November take flail: let ships no more sail.

If there's ice in November that will bear a duck,
There'll be nothing after but sludge and muck.

"Oft in this season, silent from the North,
A blaze of meteors shoots."

THE MATRICULATION EXAMINATION OF THE UNIVERSITY OF LONDON.

SIR ARTHUR RÜCKER, Principal of the University of London, took the opportunity when delivering the Introductory Address at St. Mary's Hospital Medical School, Paddington, at the opening of the Winter Session on October 3rd, to explain the objects the Senate of the University had in view when framing the new regulations which will in future govern the examinations held by the University. So many teachers in secondary schools prepare candidates for the Matriculation Examination of the University of London that they can scarcely fail to be interested to learn the intentions of the Senate, as explained by the Principal, when adopting the syllabuses by which the work in their schools will now be largely influenced. Other matters relating to the re-organisation of the University were dealt with, but the following extract is concerned directly with the work of secondary schools.

A new Matriculation examination has been devised, which has just been held for the first time and will entirely replace the old form of examination after June next. It differs from the old examination chiefly in the fact that the number of subjects required has been reduced from six to five and that greater liberty of choice is allowed to the candidate and therefore to the teacher. The educationist nowadays has to steer his way between two policies which are to a certain extent opposed. One of these demands curricula and systems of examination which shall ensure that the student has a minimum of knowledge on all subjects which may be fairly represented as essential to a good education. The other contends that great latitude should be left to the schoolmaster in dealing with individual minds; that he shall not be compelled by some external authority to attempt to mould all boys of ordinary abilities to the same pattern; and, further, that there are so many subjects of which it is desirable that an educated man should know something that if the student is to be examined in all these the yoke laid upon him is heavier than it is good for him to bear. The new Matriculation is deliberately framed so as to leave the master a wide latitude of choice. It must not be taken as

NATURE NOTES FOR NOVEMBER.

By the REV. CANON STEWARD, M.A.(Oxon.)
Principal of Salisbury Training College.

Animal Life.—Observe the different ways in which the different animals prepare for the winter.

Dormice and squirrels may be found hibernating in nests in the thickets and hedgerows, while curled up in dry grass and leaves upon the ground the sleeping hedgehog may be revealed by a barking dog. Insects rest in their pupa state, and the snails are glued up in a dry corner in clusters, worms and moles go deeper underground. Bats sleep head downwards in barns and belfries.

The usual month for influx of Pochards and other winter ducks from the north, also Woodcock and Snipe, their numbers varying with severity of weather. Starlings form roosts of many thousands, copses being ruined for game purposes from disturbance caused by their noise and numbers. Rooks have a habit of revisiting their nests. Lapwings congregate in large flocks. Merlin appears as a winter migrant. Longtailed Tit often seen flitting before us in numbers in Indian file. Dabchicks now more frequently visible in water meadows. Blackheaded Gull haunts inland rivers for town débris.

Trout make redds in streams and spawn. These may be easily seen and the habits watched. *Geometra dilatata* and *brumaria* are almost the only moths now found. The lengthening evenings may be spent in naming, resetting, and rearranging specimens. Gall-flies (Hymenoptera) afford an interesting study. The galls found on leaves and other parts of trees should be collected, each species placed in a separate box, bottle, or jar with a glass cover, and the emergence of the flies

indicating that in the opinion of the University a school curriculum should embrace five subjects only, or that any of the permitted combinations of five subjects are in ordinary cases equally suitable. For myself, I think that a boy looking forward to a scientific career will be wise not to neglect Latin. I think it desirable that all boys should be taught science, but I very much doubt if the kind of science which is the best counterpoise to a too exclusively literary education is that in which proficiency can best be tested by examination. For the moment, however, I am not concerned with the controversies which rage round this question. I only wish to point out that the new examination makes it possible for London medical students to enter upon the university course whatever their previous educational history may have been. A boy brought up by teachers who ignored science will not be made to suffer for their sins provided only he has been reasonably well educated in languages. A student whose education has been chiefly on modern lines will not be rejected by the University, provided that in addition to an adequate acquaintance with science and mathematics he knows something of his own and at least one other language.

No doubt this system, like every other, may be criticised. Thus it may be urged that by means of the Matriculation examination pressure ought to be brought to bear upon all schools to teach, say, both Latin and science. The answer to this criticism is not difficult. The examination of the few students whom a headmaster may select to send in for the Matriculation examination is a very imperfect test of the efficiency in the teaching of the school. That can be better applied by an examination of the school as a whole. Such examinations have for many years been conducted by the universities. The University of London has established a separate department which will deal with this question, and I venture to think that any influence which the universities may legitimately exercise on the curricula of schools will be more usefully applied directly by examination and inspection than indirectly by compelling matriculants to submit themselves for examination in everything that they may reasonably be expected to know. Those masters who prefer a public test to that of a special school examination can still send in their students for the Matriculation; and a further change which has been introduced may perhaps make this test more satisfactory than heretofore. Up to the present the same examiners have conducted all the examinations in the same subject from the matriculation to the doctorate. It does not follow that the expert who can best gauge the value of a thesis worthy of a place in the "Transactions of the Royal Society" is also the best qualified to test the attainments of matriculation. In future, therefore, special examiners will be appointed for the matriculation, and there are every hope and desire that masters of schools will themselves share in work for which they are specially qualified. Already the University has been fortunate in securing the services of several distinguished teachers at the public schools to act as examiners in the Matriculation, and the local interests of the reorganised University are emphasised by the fact that among them is the headmaster of Westminster.

Finally, the Matriculation examination is no longer to be used as a means for distributing honours and awarding scholarships, though, as in the past, candidates will be placed in two divisions. It is, however, the earnest desire of the University authorities to reduce the number of examinations as far as possible, and they have resolved upon the establishment of one general scholarship examination with the requisite number of options and variants in which the University will examine, not only for its own scholarships, but for those of any school of the University or of any suitable body of trustees which may be desirous of using the University examination for that purpose. It

has been found to be possible to hold common examinations for the scholarships of several colleges at the older universities; it ought not to be impossible in London, and I do not see why the scheme should not be carried further, and why the results of the ordinary Matriculation examination should not be communicated to college authorities even in the case of students who do not pass, if that course will help to make that examination serve as a substitute for college entrance examinations, or why honours in the Matriculation should not be replaced by an honours' list published in connection with the scholarships. All I can say is that in these and all other respects there is the most earnest desire on the part of the University to co-operate with the schools in devising a system free from red tape which shall make a few examinations serve as many purposes as possible.

The new Matriculation examination is not intended to be easier than the old form: it is intended to be more elastic, to do something to free English education from mere dependence on examinations, and in particular to make the relations between the universities and the schools less rigid, to leave more to the teacher and less to the examiner. Of course, this effort to make the examination system more flexible, and to direct the teaching of science into forms in which individualism is encouraged, is objected to by those who believe that science teaching must fall into the background if it is deprived of the support of the rule that no one shall be allowed to enter the University of London unless he can pass an examination in science.

The objection, in so far as it has any weight, is based on a misconception of the policy of the University. In the more advanced examinations of internal students—that is, of men studying in or near London under conditions approved by the University—it is possible to mitigate the evils of the examination system. It is possible to supplement the evidence obtained in the examination itself by an inspection of the work done during the course of study. It is possible to carry out practical examinations in the laboratories in which the students have worked. But the Matriculation examination is from its very nature an examination of all and sundry, of half-a-dozen students from this school and a dozen from that, of students over whose past career the University may have had no control, who have been taught by teachers of whom the University may have no knowledge. In so far as that control and that knowledge may be obtained, it can best be exercised by dealing with the individual school, by supplementing examination by such inspection as may make that examination a real test of the student and a real test of the school. Every effort will be made to co-operate with the school authorities to free them from the necessity of moulding their teaching to suit one rigid system of examination. If they believe that the best scientific examination for many boys of school age is not so much an acquaintance with the theories of physics and chemistry as the education of the hand in the workshop and the cultivation of the power of observation by the study of natural history in the field, they will be free to follow the course thus marked out by their own experience, to lay the results before the University inspectors, and to get full credit for the work they have done. There can be little doubt that, when the system is fully developed, one vast examination will be replaced or supplemented by a harmonious co-operation between the University and the schools, a system more flexible and therefore more efficient than any examination test can be. Such a system will not be established in a day, and while it is growing the University has determined that no rigid rules of its own shall check the development of scientific teaching on the most modern lines; and while I, as an individual—and, if I may venture to speak for them, the Senate as a whole—urge with all the force of a strong conviction the policy of teaching all boys and girls some science, of doing all that can be done to detect boys and girls of scientific ability

and to make the most of powers which will be invaluable to the nation, yet it may be, and I for one think that it is, more important to strike a blow at the common error of trying to get the right thing done in the wrong way, to influence the schools by examinations for which at the best only a few of their students enter.

THE TRAINING OF TEACHERS.¹

By H. L. WITHERS, M.A.

Professor of Education in Owens College, Manchester.

THE problem of the Training of Teachers is essentially different in a primary and secondary school. In the former a considerable though incomplete system has been in existence for the best part of a century, while in the latter the provision made is still so defective that, at least in the case of boys' schools, it may be said that we have everything to do from the beginning. For the primary teacher large Government grants are given, while nothing is as yet allowed for the secondary. Primary schools are fairly homogeneous. Secondary schools display a great multiplicity of types, social and educational, day and boarding. The problem in the two cases must therefore be treated separately.

Taking primary teachers first, the question of the improved education of pupil teachers is perhaps the most urgent. The system put in force in Bolton in Lancashire, through the liberality of Mr. Thomasson, suggests a promising line for local authorities to adopt. Scholarships should be given to enable pupil teachers to attend secondary schools, and the period of apprenticeship should be shortened. Central schools for pupil teachers will probably be dealt with as part of the general provision for secondary education.

If pupil teachers from rural and small urban districts came up to training colleges with a better preliminary education, the difficulties of the colleges would be greatly lightened.

The change made twelve months ago by which training-college authorities for the first time have been asked by the Board of Education to lend a hand in framing their own schemes of study was a great step in advance. The old curricula, especially those prescribed by the Science and Art Department, were often far too heavy and long, and were drawn up by scientific specialists who did not understand the principles of education nor the circumstances of the student for whom they prescribed. But the recent change involves great administrative difficulties which have not yet been solved.

It is expected that the education authorities to be established under the Bill now before Parliament will do much to improve and extend the existing system of primary training. If they institute new colleges or hostels, it should be done by counties and county boroughs in combination, and the new institutions should be affiliated to universities so as to save them from the narrow and mechanical routine of purely professional seminaries. Model schools should be provided in connexion with all training colleges by the local authorities, and would vastly enhance the practical value of the training given.

As regards secondary schools, the multiplicity of types is so great that anything like a single stereotyped system of training would be futile. The secondary schools themselves must have a large share in framing an elastic variety of systems, and the

training provided must be consistent with all that is best and strongest in our existing tradition. But competent judges, such as Mr. A. C. Benson, of Eton, admit that our public schools, with all their excellencies, have failed to rouse intellectual interest and the wish to learn, and have left many of the pupils without either the habit of intense concentration or the idea of scientific method. This failure points to defects in their curriculum and methods, such as were revealed in the recent Report on our great Preparatory Schools drawn up by the preparatory schoolmasters themselves. If the analogy of other professions is any guide, a combination between the schools and the universities is essential for the institution of a complete system of professional training.

The problem is largely an economic one, for the cost of an additional year of post-graduate study cannot, with fairness, be thrown entirely upon teachers, whose prospects of an income are for the most part small, and the prizes of whose profession are reserved for members of another calling.

In this, and several other respects, the position of men as regards training is quite distinct from the position of women. Teaching as a profession for women is, relatively to other occupations, at present freely accessible to them, much more desirable on purely economic grounds than it is as a profession for men. Women have already the nucleus of a considerable system of training, partly in special departments attached to famous schools like the Ladies' College, Cheltenham, and the High School at Clapham, partly in training colleges. But, unfortunately, training has been too often regarded as an *alternative* to university studies instead of a *sequel* to them. Consequently, with some few exceptions, the women with the highest qualifications have not been trained, and conversely, trained women have not, as a rule, had a university education. Reference should be made to the excellent colleges which have been established for the special training of kindergarten and infant teachers.

For the purposes of men and women who prefer to obtain their professional training at universities, each university must, for the future, be equipped with a department of education as effective as its departments of law and medicine. In this, a concrete and comparative study of educational organisms and methods, material for which exists in Mr. Sadler's volumes of "Special Reports," should be carried on, together with practical exercises in teaching and observations of actual school-work. Experienced masters and mistresses should give lectures and demonstrations in connexion with the work of such a department, and there should be a museum of educational appliances and a library of educational literature.

Secondary teachers have usually to specialise in one subject or group of subjects, and they will need the help of specialists in their study of method. As much as time allows must also be done to refer students to the principles of mental, moral, and physical science upon which the theory and practice of education must ultimately be based, and the history of education and of educational institutions must not be neglected. A continuous course of probation must be served by each student in a school of the same type as that in which he is preparing to work as a master.

Room must be made for other forms of training also, and the utmost freedom of experimentation must be allowed to begin with, consistently with thoroughness and efficiency. If vigorously taken up by Parliament and the local authorities, as well as by universities and schools, all working together, the professional training of teachers cannot but exercise an immense influence upon the future of education in England, and help to provide that army of disciplined and resourceful men and women upon which the success of the country, in peace and war, must finally depend.

¹ Abstract of a Paper read before the Educational Science Section of the British Association, at Belfast, September, 1902.

PRELIMINARY TRAINING OF WOMEN TEACHERS.¹

By L. EDNA WALTER.

THERE are at present four main classes of students intending to become teachers.

(1) Those who go through an ordinary secondary-school course and leave, intending to go to college and take a degree.

(2) Those who leave a secondary school after passing some examination such as the London Matriculation, or part of the Higher Local.

(3) Those who cannot quite reach the standard of the examinations passed by the members of the second class, and take a lower one, or the King's Scholarship.

(4) Those who spend their time partly in teaching and partly in learning, *i.e.*, those generally known as pupil teachers.

The members of the first class will almost without exception become teachers in secondary schools, and the members of the last two in elementary schools. Those of the first class who train will be eligible to be placed in Column B of the Teachers' Register; those of the third and fourth who train, or get a teaching certificate, will be placed in Column A.

The members of these four classes differ in kind and also in the fact that the last not only do not pay for their education, but receive small sums varying from about 3s. 6d. to 10s. a week to help in their maintenance.

The members of the first and second groups will differ not as to what they have done at school but as to what they can do afterwards; those of the second group are unable either intellectually or financially to follow a full university course. They can be divided into four classes:—

(a) Those who receive no further systematic education but start teaching at once, taking a poor position in a secondary school and remaining underpaid for the rest of their lives.

(b) Those who can manage to take a year's course of training and gain a teaching diploma. They take a considerably better position and will be well fitted to teach the lower forms of any good school.

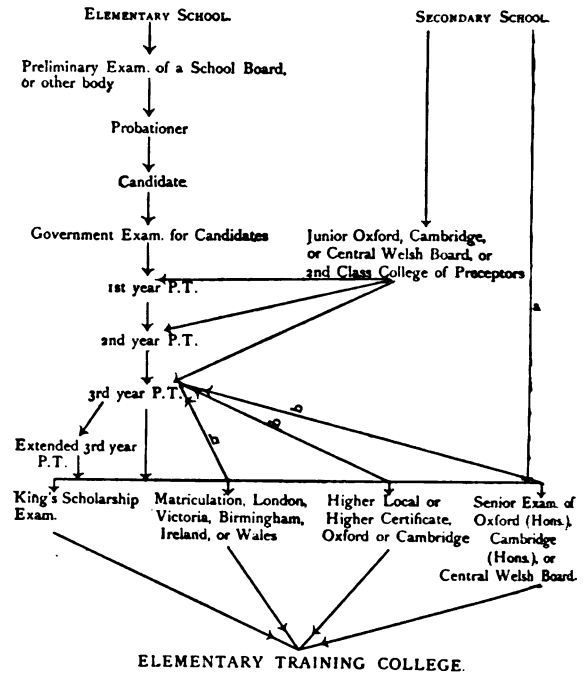
(c) The third division consists of those who take a further year of study, pass the Intermediate Examination for a degree, or a similar examination, and then train for a year at a secondary training college.

(d) Those matriculants who enter an elementary training college, and after taking the two years' course pass the examination for the certificate. These then enter upon life as elementary teachers and obtain their "parchment" about eighteen months later. This course will also be followed by those in the third and fourth classes. While it will probably pay the student better to go through the course sketched in section (d), I am of the opinion that the work section (c) will produce the better person.

It is desirable to increase the number of well-educated people who take up elementary teaching, and much has been said about attracting those who have had a wide course of study; nevertheless, difficulties stand in the way of most of those who have not been through the usual mechanical mill. An example is furnished by a girl who has taken the Higher Local Honours certificates—accepted by the Consultative Committee and the Board of Education as an equivalent of an Arts degree—and, having been trained, has obtained her teaching diploma. She is eligible—not merely during the next three years—but in the future generally—to be placed in Column B of the register. However, she is not considered as a "certificated teacher" for an elementary school. She can only count as an "assistant

teacher" under Art. 51 of the Code. The point is that we are dealing with a well-educated woman and a trained teacher. Both in education and training she has reached a much higher standard than can be attained by most elementary teachers. It is to be hoped that before long the regulations may be modified to enable teachers such as this to be recognised as "certificated" without the worry and fatigue of another examination; an examination, moreover, of a lower standard than the one they have already passed. A graduate is certainly recognised as a certificated teacher if she has been trained at a secondary training college and has gained her diploma. But those who have done all this are not as yet a very large body, and most of them will keep to secondary schools. They will usually prefer that work as being more pleasant, even though the salaries are not so high as in good posts under the well-known school boards.

I now come to those who decide definitely to take up elementary teaching, those in Classes III. and IV., the numbers in Class IV. largely exceeding those in III. I have shown in the chart the different ways of becoming a pupil



teacher, and I think most people present will agree with me in regarding that course as the best which involves the longest time being spent at the secondary school. Many a girl spends five years at a centre, coming from an elementary school as a "probationer"; then, after a year as "candidate," she is indentured for three years until as an ex-pupil teacher she is ready to enter college. How much better that girl would have been had she spent most of that time at a good secondary school!

At a secondary school, if after a year or two's work a girl were obviously intellectually unfit, she could be advised to throw over the work for the special examination and take up something totally different, such as millinery, or another trade. It is very difficult to turn a pupil teacher into a different path, and merely a low brain-power is not enough generally to cause the indentures to be broken.

Some practice in teaching under guidance is most valuable before training, but a period varying between six months and a year ought to be ample, and certainly every elementary school is not a suitable place for this practice, for every head

¹ Abridged from a Paper read before the Educational Science Section of the British Association at Belfast, September, 1902.

teacher is not good enough for such important work as helping to train the rising generation of teachers. The course which I think would be of most advantage to intending teachers would be to go to a secondary school, and at seventeen pass one of the qualifying examinations given in the Code, having signed an agreement to become an elementary teacher in the event of the education being at the public expense. A year or less could then be spent in teaching classes, not too large, in a specially chosen elementary school, and the following two years in study and training according to her capabilities. Her course before training is indicated by the lines (a) and (b) in the chart.

With the possibility of primary and secondary education coming under one authority, there ought to be little difficulty in arranging that all promising girls of both secondary and elementary schools who wish to become teachers should be able to continue their education at a secondary school. The problem is, of course, more difficult in country districts than in towns, but when we see what a distance some of the children travel in Wales to attend one of the county Intermediate schools, and how their parents arrange for them to live near the school from Monday to Friday in each week, we ought not to despair of diverting the pupil teachers into a different channel. In some districts schools may have to be built, in some the pupil-teachers' centre may itself be converted into a secondary school.

Many elementary teachers receive a rise of salary only after obtaining certain examination qualifications. This encourages a craving for certificates—gained no matter how—which reacts on the pupils throughout the schools, on pupil teachers, and so on round and round the circle. I should like to appeal to the governing bodies of all schools to judge their teachers by their ascertained worth and capabilities, and not by certificates.

There are two things which I should like to see taught to the elder girls at least in every school or centre:—

(1) How to read books.

(2) How to increase their knowledge practically by simple experiments, as distinct from book-work.

Each of these would need from two to three hours a week, and I suppose I shall be met with the cry of "No time." But I will answer that by asking: can you find anything better worth doing in those hours? I need not, after our President's address, dwell on the necessity for experimental work, but the art of intelligent reading might be encouraged if bad text-books and "graphed" notes were abolished, and if the work, say, in History, Literature or Geography could be taken for a year or more on the lines suggested in the specimen courses of instruction for training colleges issued by the Board of Education. Here, again, I will appeal to the managers of the schools to alter things. No Board of Education can prevent the unfit being veneered to look like the fit, but the managers of the schools can. In many cases pupil teachers are so little used to reading for themselves that they never lose the habit of learning summaries and phrases by heart.

In conclusion, I may sum up by stating that in the case of all girls, whether from elementary or secondary schools, who intend to be teachers, provision should be made for them to have a good secondary education with other girls who are intending to enter other spheres of activity; that ability and desire should determine whether they are to be elementary or secondary teachers; that in the case of elementary teachers, at any rate, they should have a period of teaching under supervision, and that they should then study for one year and train for another; the year of training to be *entirely* devoted to professional work and not to the acquisition of mere knowledge. Lastly, should we not appeal to managers of schools to reward their teachers by estimation of worth, and not by payment on certificates?

THE CONDITIONS OF HEALTH IN SCHOOLS.¹

ANTHROPOMETRIC OBSERVATIONS OF PUPILS.

In all methods adopted for carrying on the work of instruction in schools health conditions must be recognised as an essential principle, seeing that in most cases the greater part of a child's day is spent within the influence of the school, and no teaching can be considered successful unless so arranged that the health of the scholars may be properly maintained.

The health conditions relating to school life which appeared to the Committee to be appropriate for consideration include:

(1) Bodily nourishment; (2) clothing; (3) housing of children in schools; (4) the working of the bodily functions and organs of sense; (5) physical exercise; (6) the apportionment of time to work and rest, including length of lessons and holidays; (7) healthy tone of mind and morals; (8) preventive and precautionary measures against infectious diseases.

It was not considered practicable to deal with all of these subjects in the first report, and it was therefore decided to direct attention to the following points:—

A collection and tabulation of records of original observations on the periods of day appropriate for different studies, the length of lessons, and periods of study suitable for children of different ages.

A collection and tabulation of anthropometric and physiological observation-forms in use in various schools with a view to prepare a typical form for general use.

A collection and tabulation of anthropometric and physiological observations recorded in different schools for a series of years on the same children.

A collection and tabulation of recorded investigations into the causes of defective eyesight in school children and a definition of the conditions necessary for preserving the sight.

An inquiry into the practical knowledge of hygiene possessed by school teachers.

For this purpose several sub-committees were appointed, and much information has been collected from which the following is an extract:—

Anthropometric and Physiological Observations.

The Sub-committee appointed to collect and tabulate anthropometric and physiological forms in use in various schools with a view to preparing a typical form for general use, and to collect and tabulate anthropometric and physiological observations recorded in different schools for a series of years on the same children, report as follows:—

An application to the schools from which information was furnished to the Anthropometric Committee in 1878-1883 has given the following results:—At Eton College Dr. Warre informs the Committee that there has not been any systematic collection of information since 1883, and that no forms are in use for the purpose. At Westminster School Dr. Gow informs the Committee that no anthropometric observations are taken, but he expresses the opinion that they ought to be made, and the Committee hope that the presentation of this report may lead to their being undertaken. At Radley College measurements are taken in the following form:—

¹ From a report of the Committee of the Educational Science Section of the British Association "On the Conditions of Health essential to the Carrying on of the Work of Instruction in Schools," of which Prof. C. S. Sherrington, F.R.S., is Chairman, and Mr. E. White Wallis, the Secretary.

RADLEY COLLEGE GYMNASIUM.

1st Measurements and Date when taken				2nd Measurements and Date when taken....		
Age	Height	Weight	Girth of Chest a. inflated b. normal	Fore-arm	Upper Arm	Similar observations are made under same headings.
Years	Ft. in.	Stn. lb.	Inches	Inch.	Inch.	
			a. b.			

At Felsted School, Essex, the form adopted is as follows:—

No.	Names (arranged in alphabetical order)	Height (in stockings)		Weight (in trousers only)		Chest (standing natu- rally, army measurement)
		Feet	Inches	Stones	Lb.	Inches

In Bootham School, York, anthropometric measurements have been taken regularly six times every year (i.e., at beginning and end of every term) since January 1896, and Mr. A. L. Dawes has kindly furnished the Committee with a copy of the form used as follows:—

ANTHROPOMETRIC MEASUREMENTS.

Name.....

—	End of Term	Beginning of Term	A Year ago
Age (years, months)			
Height (feet, inches)			
Weight (pounds)			
Chest expanded (inches)			
Chest contracted (inches)			
Forearm (inches)			
Upper Arm (inches)			

Signed.....

Date.....

At Hampstead School of the King Alfred School Society (founded 1897, incorporated 1898) the following is the form adopted:—

MEDICAL REPORT.

Date: Date:

Name:		Mouth:	
Age:		Sight:	
Weight:		Hearing:	
Height:		Nose:	
Head Measurements:		Nutrition:	
Chest Girth:		Nervous Signs:	
Chest Expansion:		Remarks:	

The most important and systematic collection of anthropometric statistics in a school of which the Committee are aware is that made in Marlborough College. The master has kindly furnished the Committee with copies of the annual reports of the Marlborough College Natural History Society from the year 1884 (except that of 1890, which is out of print), which contains each year a return of the number, name, form, age, height, weight, chest girth, circumference of head, leg, and arm, and of

the increase in each since the last measurement. In later years the chest has been measured both expanded and contracted. Mr. Mayrick, by whom this great work has been superintended for many years, observed that the full expansion of the chest is easy to get, but the full contraction is not so easy; if, however, the chest is emptied by an audible continued expiration, it is easy to tell by the sound when the limit is reached. A column is given showing the difference between the expanded and contracted chest. This is a measure of the capacity of the effective respiration, and the greater the difference the higher is the efficiency of the breathing apparatus, and probably the vital energy is greater in proportion. This index by no means necessarily rises with the age, and is, in fact, sometimes unexpectedly high in young boys. The age is recorded in years and months, not in decimals of a year; the height is given in inches and decimals of an inch; the weight in pounds to within half a pound only; the chest measurement in inches and decimals. The Report of the Anthropometric Committee presented to the British Association in 1880 contains a series of tables founded on the observations taken in Marlborough College from 1874-1878 on height, weight, chest girth, head girth, arm girth, and leg girth. It would be desirable to continue that tabulation to the present time, but that would be a work of very great labour and not inconsiderable expense.

In the North London Collegiate School for Girls a lady medical inspector has been appointed since 1887, especially with a view to determining the kind of physical exercises that are suitable in different cases, and that official has established a system of anthropometric observations which is more than usually complete. Mrs. Sophia Boyant, D.Sc., the head mistress, has kindly furnished the Committee with a copy of the form in use, which is as follows:—

Name.....	No.....
Age (years)	
Height (inches)	
Weight (lb.)	
Head	(centimetres)
Antero-posterior diameter	
Transverse diameter	
Circumference	
Vault	
Eyes	
Vision { Right	
Left	
Astigmatism { Right	
Left	
Colours	
Chest	
Circumference (inches)	
Condition of lungs	
Condition of heart	
Vital capacity (cubic inches)	
Muscular Power	(inches)
Circumference of	
Stays waist	
Vest waist	
Muscular Power	(lb.)
Power of grasp { Right	
Left	
Power of back muscles	

Medical Inspector's Notes.

Secretary's Notes.

In the forty-fourth report for the year 1900, Inspector of Reformatory and Industrial Schools in Great Britain, Mr. J. E. Legge ("Parliamentary Paper," cd. 840, p. 54), is contained a physical census of boys and girls in those schools taken in July, 1901. The superintendents in industrial schools were asked to

furnish the height, weight, and chest measurements of all boys, and weight of all girls, between the ages of eleven and twelve and fourteen and fifteen. These ages were selected because they were convenient for comparison with the statistics published by the Anthropometric Committee in 1883. The height was taken without boots, the weight in clothes but without boots, and the chest girth with the chest empty. The results with some important comments upon them will be found in the Blue-book referred to, and the Committee are glad to know that Mr. Legge contemplates calling for a similar return in 1903, when the boys and girls who were between the ages of eleven and twelve will have reached that which was the higher age in the previous census, and then a double comparison may be effected. The Committee have been favoured by Mr. Legge with an expression of his strong opinion that inquiries of this sort are far more likely to get results if the particulars asked for are few and the apparatus to be used perfectly simple and as little like a laboratory instrument as possible. In asking merely for height, weight, and chest measurement, he obtained those particulars from practically everybody he applied to, so that minor inaccuracies were checked by the great mass of figures (3,679 boys, 1,246 girls) he had to deal with. Had he asked for arm-stretch, force of resistance, and other nervous tests, he would not have obtained one-tenth as many returns, and those with greater difficulty. The following is the form he used :—

REFORMATORY SCHOOL.

Boys between 14 and 15.

Height (without boots), weight (in clothes, but without boots), chest measurement (over shirt, but with chest empty).

Name or Number	Town or County from which sent	Height (without boots)		Weight (in clothes, but without boots)		Chest (over shirt, but with chest empty)
		Ft.	in.	Lb.	oz.	In.

Thus far with regard to the collection of anthropometric observations in schools. With regard to the practical application of them and the deductions to be made from them, the Committee desire to draw attention to an excellent paper on the physical examination and development of public schoolboys read before the Medical Officers of Schools Association on April 4th, 1899, by Mr. Cecil Hawkins, of Haileybury College.¹ Taking the records of over 40,000 observations and adopting a modification of Mr. Francis Galton's plan of percentiles, the author has constructed diagrams showing from each year of age, from eleven to eighteen, a series of twenty curves of growth, increase of weight, and increase of chest girth. The application of these diagrams is simple and effective where periodical observations of the same individual are kept. Thus an example is given of a boy who for three successive half-yearly periods was in the curve numbered nineteen, next to the lowest in respect alike of height, weight, and girth. In the fourth half-yearly period he was up to the eighteenth curve in height; in the fifth he reached the seventh in weight and the eighteenth in girth. In the seventh he gained a place on the seventeenth curve for height and the sixteenth for weight. In the eighth he fell back a little, receding to the eighteenth curve in weight and the nineteenth in girth; but in the ninth he recovered, rising one step in each. This example and others, given in the same paper, show that by means of these curves an exact demonstration of the physical history of each individual may be made. They lead to the consideration of another point which is within the reference to this Committee, that is, the necessity for

¹ See THE SCHOOL WORLD, May, 1899.

physiological observations. Where the statistics are treated in this method, showing a fall and recovery in the relative conditions of growth, it is evident that the cause of such fall and the conditions of such recovery ought to be sought for. The Committee are therefore of opinion that the plan adopted by Mrs. Bryant of leaving a space for the medical inspector's notes is desirable, and that in that space should be entered any event in the history of the person under observation affecting his general health.

Subject to this observation, the Committee attach weight to the recommendation of Mr. Legge, and, while desiring that, wherever practicable, a more extended series of observations should be set on foot, such as that at Marlborough College and the North London College for Girls, cannot resist the conclusion that for schools generally a simple record of height, weight, and chest girth is all that can be expected. For the purpose of keeping the record of each individual and dealing with it upon the ingenious method devised by Mr. Hawkins, the card system would be found very convenient.

The following form of card is suggested :—

School,	Date,	19
Initial or Register No. of scholar,	Sex,	Age, years months.
<i>Weight and Measurements.</i>		
Weight in indoor school costume, without shoes	lb.	oz.
Height, without shoes	in.	quarters.
Chest girth at nipple line when fully expanded, the pupil standing upright, with chin elevated and eyes directed horizontally forward	in.	
<i>Observations.</i>		
Mouth	{ Teeth	.
	{ Tongue	.
	{ Palate	.
Eyes	Snelling's letter test (in full daylight)	.
Nose	{ Breathing	.
	{ Adenoids	.
Nerve signs	{ Face	.
	{ Hands	.
	{ Body	.
	{ Posture	.
<i>Medical Inspector's notes.</i>		

ITEMS OF INTEREST.

GENERAL.

THE House of Commons re-assembled on October 16th for its autumn sitting. In moving a resolution giving Government business precedence for the remainder of the Session, the Prime Minister emphasised the fact that the Session was to be prolonged for the express purpose of passing the Education Bill, and this Bill would be the main business every week for the remainder of the Session. As we go to press, Clause 8 is engaging attention, and three lines of it now stand part of the Bill as amended. Since there are over eighteen folios of amendments to this clause, it will probably not be disposed of for another week. Following our usual practice, we shall, in our next number, summarise the changes adopted in the clauses of the Bill.

It may be doubted whether any of the numerous University celebrations of the second half of the nineteenth century exceeded in interest the Bodleian Tercentenary festivities which took place at Oxford on October 9th. Universities, learned societies, and libraries of every continent, sent representatives with addresses of congratulation, in which one and all expressed the indebtedness of learning to the happy inspiration of Sir Thomas Bodley. He was a reformer rather than an originator. A lending library existed from the thirteenth century for the use of poor scholars, and in the fifteenth century Bishop Cobham's library was housed in the University church. Duke Humphrey's library was built over the Divinity School at the end of that century, and still exists with its ancient shelving and decorations

as the western end of the Bodleian buildings. Bodley's reforming activity began about a hundred years later, and the subsequent history of the library is one of steady growth. The guests of the University appeared in the robes of their respective academies, and their brilliant costumes added greatly to the picturesqueness of the scene. Honorary degrees were conferred on distinguished visitors, who received a most cordial reception as each was presented to the Vice-Chancellor in a short Latin speech. The three persons who appear to have made the deepest impression upon those present were the Public Orator (Dr. Merry), who delivered the Commemorative Oration; Sir R. C. Jebb, who proposed at the dinner in Christ Church Hall the toast of the Pious Memory of Sir Thomas Bodley; and Mr. A. E. Cowley (Sub-Librarian of the Bodleian), the polyglot and genial Secretary.

IN one of the many biographical notices of Émile Zola we read that while he was at school he wrote a short play, entitled "Enfoncé le pion." We presume the equivalent English schoolboy slang for this would be, "The usher sucked." Other more polite translations have been attempted. It cannot but be regretted that Zola's name is banned in English schools, if only for one reason—that his exquisite short story, "L'Attaque du Moulin," is not more frequently used as a reading book. We believe Messrs. Hachette published an edition with notes some years back; but we should doubt whether it had the sale it deserved. As the writer of the biography in "Men of the Time" observed: "This is one of the most powerful short stories ever written in French, even when it is compared with the others which appeared in the same volume, such as Guy de Maupassant's 'Boule de Suif.'" The volume was the "Soirées de Médan," named after Zola's house near Paris.

THE London County Council Day Training College, which is attached to University of London, was opened in temporary rooms at the London School of Economics, on October 6th. As was pointed out by Mr. Organ, in an article in THE SCHOOL WORLD for July, 1901, the college is intended for duly-qualified students of either sex who are engaged in or intend to enter the teaching profession. At the inaugural meeting Sir John McDougall, Chairman of the London County Council, gave a description of the formation of the college and announced that it began its work with 62 students. Professor Adams, the new Principal, delivered the inaugural address on "The Training of Teachers."

IN his annual statement to the London School Board at its first meeting after the summer recess, Lord Reay, the Chairman, gave a statesmanlike review of the state of elementary education in the metropolis. Referring to the magnitude of the work of the Board, he said, the number of teachers, including heads, assistants, and pupil teachers, is 13,885; of instructors, including those employed in manual training, domestic subjects, and special schools, 1,285. The head office staff numbers 559, the superintendents of visitors, visitors and local staff, 444; the schoolkeepers, 464; the correspondents and their staff, 35; the clerks of works and artisans, 154. In this total are included about 4,000 persons employed by the Board in the evening schools, but, except in 500 cases, they also hold appointments under the Board in day schools. The work of the School Board is transacted by 41 committees and sub-committees, 31 of which meet at fixed dates, and 10 as business requires.

THE cost of school buildings erected by the London School Board has increased with great rapidity. In 1885 the average cost of a school place, exclusive of site and furniture, was £11 8s. 3d.; in 1890 it was £17 6s. 5d.; in 1895 it was £20 9s. 9d.; and in 1900 it was £25 12s. 6d. This increase of cost has been partially

due to the necessity for providing centres for the teaching of special subjects, such as manual training and domestic economy; and for the education of blind, deaf, and defective children, a duty which has been imposed upon the Board by statute. But it has been due also to the rise in wages and to the increased cost of materials generally, and of sanitary work. Among other causes of the increase in the expenditure of the London School Board, Lord Reay pointed out that the average annual gross cost per child for school maintenance has risen from £2 4s. 9d. in 1874 to £4 11s. 6d. in 1902, and the average annual net cost from £1 12s. 8d. to £2 18s. 3d. The cost per child in 1902, on account of teacher's salaries alone, was £3 3s. 11d., that is, more than double the cost in 1874 with regard to that item. This increase is due to improved scales of salaries, to normal annual increments of salaries of teachers, and to the reduction of the ratio of scholars to teachers.

NOTWITHSTANDING these increases, the Board experiences some difficulty, in many parts of London, in obtaining efficient teachers. The efficiency of the schools depends on the efficiency of the teachers, and the Board would have laid itself open to severe censure if it had failed to attract efficient teachers by sufficient remuneration. Concluding his address, Lord Reay said: "We do not know what is in store for the Board, but whatever may be our fate, we have at least a clear conscience that the School Board for London has not been found wanting in the faithful discharge of the trust which the ratepayers of London have committed to it. The sense of responsibility has been equal in both parties on this Board, and—divergent as may have been our views—joint action has never been imperilled, because we have had one common aim, to sow the seed which would secure to London, and to the Empire, generations of God-fearing, patriotic, and law-abiding citizens."

AN interesting Nature-Study Exhibition and Conference promoted by the Technical Instruction Committee of the Bucks County Council, was held at Aylesbury on September 27th. Mr. J. C. Medd, in an address on "The Place of Nature Study in Education," referred to the growing interest in the subject throughout the world, and described the work being done in this direction in America and Japan. He very properly insisted that Nature Study was intended to supplement, not to take the place of literary lessons, which must always be the chief business of the schools. Mr. T. G. Rooper described a definite plan for a course of Nature Study in a rural school, and urged the establishment in all such schools of gardens, and the intelligent study of the life of the hedge banks, ponds, copses, and other surroundings of the school.

EVERY manufacturer, merchant, and business man, as well as every intelligent employé, should know the different products of the countries and peoples of this globe, and what they import and export; they should possess a knowledge of finance, banking, and currency, and of commercial and industrial law, as well as to read, write, and speak the language of the nation with whom they are trading. In other words, they should, at least, have a sound commercial education. With the object of affording the opportunities of acquiring the essentials of a sound commercial knowledge, the London Chamber of Commerce, at its offices at 10, Eastcheap, E.C., has organised, at a nominal fee, courses of lectures in all parts of commercial education, and, in co-operation with the foreign Chambers in London, classes in French, German, Spanish and Italian. It is hoped that the principals, the heads of departments, and others employed in our banks, shipping and merchants' offices, will avail themselves of the valuable opportunities afforded them by such an institution.

MESSRS. P. LYDDON-ROBERTS and E. E. Denney direct attention to an important change in the Regulations and Syllabus for Acting Teachers in the Certificate Examination, 1904, of the Board of Education. In the subject of General Elementary Science, including nature-knowledge, candidates will not be expected to master the whole of the subjects detailed under the headings physiography, elementary biology, and domestic science and general hygiene; they may choose those which their opportunities of study and observation or their special tastes render suitable, but they will all be required to take elementary physiography, and neither biology nor domestic science and general hygiene should be wholly omitted.

THE Agent-General for Tasmania informs us that lantern slides, illustrating Tasmania and its resources, can be loaned from his department during the winter months. The slides are made up in complete sets of fifty each, and with each set an instructive pamphlet will be sent to assist the lecturer in describing the country to his audience. The only cost to the borrower will be the carriage on returning the slides—about one shilling. As some difficulty has been experienced in the past in allotting dates convenient to the applicants, as many dates as possible should be given in every application. Such an offer as this should prove of great assistance, not only to teachers of geography in secondary schools, but also to the managers of evening continuation-schools, recreative clubs, and similar institutions.

THE Report of the Annual Conference of Catholic Colleges upon secondary education, held last May, has now been published. It contains the seven papers which were read at the meetings, and we would direct particular attention to that of the Rev. John McHale, S.J., on "Inspection under the Board of Education," in which a detailed description is given of the inspection for the Board of Education of St. Francis Xavier's College, Liverpool—a secondary city school—by Mr. G. W. Rundall and four assistants. Next year's conference will take place on May 26th and 27th at St. Charles's College, Notting Hill. Copies of the Report can be obtained, price 6d., from Messrs. Jennings & Bewley, Ware.

MR. P. GOYEN, the chief inspector of the Otago Board of Education, New Zealand, recently studied the school systems of New South Wales, Victoria, and South Australia, and has drawn up a report of the results of his observations. From this valuable summary of the essential characteristics of each of the three systems we extract the following:—"In New Zealand, everybody is interested in education because everybody shares in its management. Every school has its committee elected by the householders of the district; every member of a committee has a vote for the members of the Education Board of the education district; and, subject to the general regulations of the Department of Education, the Education Board controls the educational affairs of the district. The cycle is thus complete, and local interest is a living part of the system. There is nothing like it in Australia. In Victoria and the other Australian States, there are no School Committees and no Education Boards; for the Boards of Advice answer to neither, and, so far as I could gather, have not a whit of influence, whether for good or for evil."

THE annual diary of Messrs. Philip Harris & Company, Limited, of Birmingham and Dublin, with its convenient list of public examinations, has now been published. Every science master should obtain a copy of this useful compilation.

THE *Journal* of the Department of Agriculture and Technical Instruction for Ireland for September is the first part of the third volume. Like previous issues, it contains detailed in-

formation on the numerous industries with which the Department is concerned, and instructive notes and tables showing the progress made in many different grades of Irish education. The collection of official documents at the end of the volume, which runs to over 200 pages, should be of great value to school managers and committees. A number of well-reproduced photographs adds much to the interest of this useful publication.

THE 1903 edition of the "Commercial Syllabus" issued by the Examinations Board of the National Union of Teachers is before us, and contains certain alterations with which teachers will do well to acquaint themselves. Successful students in the advanced stages of French and German will now have an opportunity of taking an oral examination, and will thus be able to make a further step in practical attainments. The work of students taking the advanced stage in commercial arithmetic will, in future, be lightened by the fact that the use of logarithms is now permitted. The course in English, which was introduced last year, and has created much interest on the Continent, has been revised, and further arrangements have been made for examination centres in the Colonies.

A CHEAP edition of "Over-Pressure," by S. de Brath and F. Beatty, which was reviewed in our issue for November, 1899, has been published by Messrs. George Philip and Son, Limited, at 1s. 6d.

ENTIRELY new editions of two of Sir Isaac Pitman's best-known shorthand works have just been published, namely, the "Manual" and the "Reporter." These are issued in the same style and prices as in previous years, although there is a substantial increase in the number of pages, including greatly improved rules, &c., with a large amount of new engraved shorthand.

THE President of the Board of Education has re-appointed as members of the Consultative Committee established under the provisions of the Board of Education Act, 1899, the following gentlemen whose terms of office expired on September 30th:—The Rt. Hon. Sir William Hart Dyke, Bart., M.P., Mr. Ernest Gray, M.P., Mr. Arthur C. Humphreys-Owen, M.P., the Hon. and Rev. Canon Lyttleton, the Venerable Archdeacon Sandford, and the Rev. David Waller, D.D., and has appointed the President of Magdalen College, Oxford, as a member of the Committee in place of Sir William Anson, Bart., M.P., resigned.

AN open competitive examination for at least one junior appointment in the Supply and Accounting Departments of the Admiralty will be held in London, Edinburgh, and Dublin, commencing on the 25th November, 1902; the limits of age for these situations are 18 and 20, and candidates must be of the prescribed age on the first day of the examination, which will be in the following subjects, viz.:—*Class I.*—Mathematics I. (elementary, including arithmetic), Latin, French or German, English composition, and geography. *Class II.*—Mathematics II. (advanced), German or French, Greek, English history, chemistry and heat, physics, and physiography and geology. All the subjects of Class I. may be taken up. Only two of the subjects of Class II. may be taken up, and if one of these be a modern language it must be different from the modern language selected in Class I. No candidate is eligible who fails to pass a qualifying examination in arithmetic and English composition. The salary attached to the appointments is £100 during a probationary period of two years and afterwards £120—£10—£200—£15—£350. All applications must be in the hands of the Secretary, Civil Service Commission, W., on or before the 6th November.

SCOTTISH.

THE annual meeting of the Educational Institute of Scotland was held in the Royal High School, Edinburgh, on the 20th September. Mr. Watson, Rector of Dumbarton Academy, the new president, kept the meeting in admirable control from beginning to end. As in former years, the time and energies of the meeting were spent in discussing details of procedure and organisation which have no interest and but little meaning to the general public. The report of the proceedings will be searched in vain for any pronouncement upon the many educational problems of the day. In the interests of education and of the Institute itself this is to be regretted. It is well known that the Committees of the Institute are doing excellent service in the cause of education, but if it wishes to influence public opinion it must not leave the records of that work hidden in minutes and reports accessible only to members. The annual meeting presents an admirable opportunity for educating and enlightening the public on the conditions and needs of present-day education, and it is a national loss when such opportunities are neglected.

THE Glasgow and West of Scotland Technical College from very small beginnings bids fair to become the real heart and life of the great industrial centre of the West. This year 5,651 students have been enrolled in the various classes and hundreds have had to be refused admission for want of space. The great majority of these are no mere tyros in their respective subjects, as the possession of well-recognised certificates is necessary in most cases before enrolment is allowed. The presence of this army of artisans, engaged for the most part during the day in hard manual toil, is one of the most hopeful and inspiring features in the life of the "dark sea-born city." A recent writer has said that the nations are met in a life-and-death struggle for commercial and industrial supremacy on every highway of the world, and that victory here as elsewhere must rest with the best prepared, *i.e.*, with the most highly trained and educated. We need have no fear of the outcome of this struggle if the 5,000 students of Glasgow and the West of Scotland are in any way representative of the rising youth of the nation.

SIR HENRY CRAIK, in opening a new school at Lerwick, referred to the great changes that had been introduced into the Code within recent years. These changes, he said, were not to be credited altogether, or even in large measure, to the Education Department or to any one member of it, but chiefly to the more intelligent understanding of the objects and aims of education which had arisen in the public mind. The merit of the Department was that it had been quick to recognise this change in the public view and had at once sought to give practical effect to it. The new conditions imposed much greater responsibilities on teachers than the old, and he was pleased to bear testimony to the manner in which the profession as a whole had risen to a sense of their responsibilities and had sought to prepare themselves by attendance at classes and in other ways for the better discharge of their duties. In connection with the subject of Nature Knowledge, for which teachers were very inadequately equipped by their previous training, 220 special classes in this subject had been organised by the Department and over 9,000 teachers had taken advantage of them—a very considerable proportion of the whole body of teachers under the supervision of the Department.

A LARGE and representative meeting of professional and business men was held in Glasgow, on October 7th, for the purpose of expressing disapproval of the action of the Scotch Education Department in imposing serious disabilities on

modern languages in the Leaving Certificate scheme. By the new regulations, as has been repeatedly pointed out in these columns, leaving certificates will not be awarded to any candidate unless Latin or Science is one of the subjects professed. A typical modern group, such as English, Mathematics, French and German, is no longer accepted by the Department as a satisfactory course of study. The grounds for this non-recognition of modern languages is based on no principle known to the teaching profession, and it is satisfactory to find this view emphatically endorsed by the remarkable gathering in Glasgow which included representative men like Dr. Jacks, ex-M.P., Sir William Arrol, M.P., Professor Gray, Sir John Neilson Cuthbertson and Dr. David Murray. A representative committee was appointed to wait upon Lord Balfour and Sir Henry Craik and to lay the views expressed at the meeting before them.

IRISH.

THE meeting of the British Association in Belfast, early in September, gave a welcome opportunity for the discussion of important problems in Irish education, especially concerning the new programme of experimental science issued by the Department of Agriculture and Technical Instruction. The occasion was seized to follow this up by a further conference at the Alexandra College, in Dublin, at which the same problems were treated and some of the leading members of the British Association were present.

THE Conference was held from the 18th to the 20th September, its object being to discuss "how best to deal with some of the difficulties which have arisen in connection with the fitting of the new subject into the school curriculum." In point of fact, three of the four meetings resolved themselves into an attack and defence of the second year's course of the Department's programme which no secondary school has been allowed to attempt until the present September, and the other meeting dealt with Natural History and Botany, neither of which has at present any place in the Intermediate system. The Conference was therefore rather academic than practical, but none the less it was an interesting innovation and will doubtless prove useful. The attendance was good but almost entirely confined to secondary teachers.

PROF. ARMSTRONG opened the Conference with an explanation of the heuristic method, the object of the programme being to introduce into schools the teaching of the method of discovery. Professor Emerson Reynolds approved of the objects of the programme and the first year's course in introductory physics, but condemned the second year's course in introductory chemistry, saying that it would plunge the student into a vague alchemistic mass of work which would lead him away from the desired end. The programme might perhaps aim at the right things, but its illustrations were unsatisfactory. Dr. Kimmins declared that his experience as an inspector in London proved the soundness of the syllabus, but Father Bodkin, of St. Vincent's College, Castleknock, was against chemistry in the second year and would prefer the simplest form of natural philosophy.

THE next afternoon Professor Howes, of the Royal College of Science, London, took the chair and gave an interesting address on the Teaching of Natural History, more particularly in elementary schools, and was followed by Miss Lilian Clarke, of the Alleyne School, Dulwich, who described how the study of living seeds and plants could be successfully carried on in schools, and by Mr. H. Wager, who gave further hints on the teaching of botany.

THE battle of the Department's syllabus was resumed on September 20th, when the Department occupied the platform and defended itself in full force. The President, the Right Hon. Horace Plunkett, took the chair, and was followed by the Assistant Secretary, Mr. R. Blair, and the Chief Inspector, Mr. A. Fletcher. Mr. Blair replied in detail to the criticisms of Professor Reynolds. He defended the policy of the Department and explained that practically every secondary school now had a laboratory, that 6,412 pupils had last year been through the first year's course, and that teachers were everywhere supporting the Department's efforts.

At the final meeting, Prof. J. Joly took the chair in place of Dr. Starkie, who was unable to attend. Prof. Joly regretted the inadequate training of science teachers (why not of all teachers?) and suggested that the Intermediate Board should transfer £10,000 from prizes for students to the salaries of science teachers in order to encourage men to take up the work. In the first year's syllabus he saw too much mensuration and too little attention to gravitation, velocity and acceleration, and thought natural history should come into the first year's work. It is somewhat to be regretted that the Conference practically narrowed itself down to almost a single issue, and that one of the meetings was not given up to the relation of experimental science to other subjects in Intermediate schools. This would have been more practically useful than a good deal of the vague denunciations of examinations in which many speakers indulged, especially in view of the declared object of the Conference which we have quoted above.

THE Royal Commission on University Education in Ireland has published the Appendix to the Third Report, containing minutes of evidence taken in April, May and June of the present year. The evidence includes that taken by the Commission when it visited, early in April, the Queen's Colleges in Belfast, Galway and Cork, and the Magee College in Londonderry, and further evidence taken later in London and Dublin. Among the names of the witnesses are the Right Rev. J. B. Crozier, Protestant Bishop of Ossory and Ferns; Dr. Anthony Traill, S.F.T.C.D.; Right Hon. Horace Plunkett; Lord Justice Fitzgibbon; Dr. Todd Martin; Douglas Hyde; Sir Francis Craise; Sir Thomas Myles; Rev. Dr. Salmon, Provost of Trinity College; His Honor Judge Shaw; and the representatives of the Women's Graduates' Association. There is appended a large number of documents with a great mass of information relating to the Queen's Colleges and with numerous suggestions relative to the subject of the Commission.

It is becoming increasingly clear that the results of the recent Intermediate examinations are unsatisfactory. In the Preparatory Grade, where the full force of the recent changes has operated, there has been an almost complete breakdown, and this in a grade where there was no competition between candidates, and only pass papers were set, which it was professed would be able to be answered by "any average student fairly well taught." In the higher grades the results have not been so disastrous, but in English composition there seems to have been little attempt to discriminate relative merit, while in drawing and English literature wholesale failure is everywhere recorded. In the awarding of exhibitions and prizes the group system has produced anomalous results and requires radical alteration.

THE natural result is trenchant criticism by the schools. The Association of Catholic Headmasters, which met on September 17th, has called attention to some of these points and forwarded several resolutions to the Intermediate Board.

They protest that the conditions of passing under the new system "are too difficult" and "involve positive unfairness;" that the results show "the want of a uniform standard on the part even of the examiners in one and the same subject;" that the Department's rule by which all students who have passed the first year's course must proceed to that for the second year, whether they have passed in the grade as a whole or not, entails great practical inconvenience, and they make a renewed request to the Board to agree to the formation of a Consultative Committee.

THE Intermediate Board has published selections from the Report of the Temporary Inspectors 1901-2. It is a pamphlet of 45 pages, containing, under the headings General Inspection, English, Latin and Greek, Modern Languages, Mathematics and Experimental Science, a general summary in answer to the following instructions to inspectors:—(a) To satisfy themselves as to the efficiency of the teaching in each school, and report thereon. (b) To report as to the sanitary condition of the school, the arrangements as to ventilation and light, the character of the printing of the books used in each school, the time table of the school, and the reasonableness of the arrangements as to hours for classes and study. (c) To report as to equipment and appliances used for the practical teaching of natural and experimental sciences in schools where these subjects are taught. (d) To ascertain and report the number and qualifications of the teaching staff in each school.

WELSH.

THERE is no institution more essentially Welsh than the National Eisteddfod. From many points of view the Bangor meeting was a distinct success. But there is a growing feeling that something more should be done in the way of organisation. Lord Mostyn, this year's president of the Eisteddfod, suggested that a Royal Commission should be applied for to reorganise and incorporate the Eisteddfod under a Royal Charter, so as to overcome the difficulties of reform from the absence of a central authority. Mr. Lloyd George has lately appealed for a representation in the Eisteddfod of other arts besides music and poetry—as, for instance, the encouragement of a Welsh drama. Some critics are concerned that the English language finds its way into use in the Eisteddfod, in speeches and in the songs. Italian, too, is sometimes chosen in the words of songs. But the most serious criticism is surely the secondary position which the Welsh choirs took in the choral contests. The fact seems to be that Welsh choirs rely too much on their fervour and enthusiasm, and that the remedy is stricter training and discipline.

IN all probability the new Education Bill will not interfere with the present administration of the county schools through the Welsh Central Board and the County Governing Bodies. The question of secondary education being therefore substantially quiescent, the concentration of Welsh politico-educationists is directed to the effect of the Bill on elementary education. Carnarvonshire County Council, as we have noted, has passed a drastic, not to say defiant resolution. But this example has not been followed by the important County Council of Glamorgan. In the latter Council, the resolution passed was as follows:—"That this Council re-affirms its conviction that the Education Bill now before Parliament does not meet the requirements of the people, and is largely in direct antagonism to the recognised principles of democratic government, but more particularly those clauses which have for their object (1) the destruction of the present School Board system, and (2) the transferring of the duties and responsibilities of the education of the children of the people to committees not directly elected by

the people, thereby violating a fundamental principle which provides that taxation and representation should go hand in hand."

MONTGOMERY County Council has passed a resolution too long to quote in its entirety, but one which very ably represents the position of education in the county. The following are extracts:—"In addition to the Intermediate schools, there are within the county 98 public elementary schools; 65 of these schools are managed exclusively by members of the Established Church, while a large majority of the pupils in many of these schools, and a considerable number in all of them, are children of Protestant Nonconformists. Moreover, in 30 parishes in the county, the only public elementary school is controlled and managed by members of the Established Church. Under the Education Bill now passing through your Honourable House the whole cost of carrying on these schools, except that of the structural repairs of the buildings, will be provided by the county rates and the Exchequer grants, while their management must be delegated by the county educational authority to bodies of managers of whom two-thirds must be appointed by members of the Established Church. The appointment and dismissal of the teachers will be vested in these bodies. Your petitioners respectfully remonstrate and protest against this constitution of managing bodies." Reasons for this protest are then offered in full.

MR. H. LEWIS, of Llangollen, a member of the Executive of the National Union of Teachers, has been explaining the attitude of the Union in its approval of two principles of the Bill, viz., extended area of management and one authority to control all grades. With regard to Wales, Mr. Lewis maintains: "It must be acknowledged, however, that the management of education in Wales requires great change in order to make it efficient. There now exist the small School Boards who will not have the school washed oftener than once a year because of the cost; who will not engage efficient teachers, for this means a slight increase in the rate. The one-man manager is also well known who insists on the teacher being a jack-of-all-trades. Such management, or rather mis-management, did not tend to efficiency, and this would be removed by an extended area of management."

MR. HUMPHREYS-OWEN, M.P., Chairman of the Central Welsh Board, has stated his views on the Bill. He considers the real reason for the opposition to the Bill is that "it is the last chapter in the fight which began in the reign of Henry VIII. That was a fight between the imposition by law of religion upon the people and a protest by the people against state-made religion." He maintained that public money should be administered under public control, and that the offices paid for by the public should be free from all religious tests. One position Mr. Humphreys-Owen held should receive attention from Welsh people. He had nothing to say with regard to individuals taking on the grave responsibility of resisting the effects of the Bill—if their consciences required them to do so. But he did not agree "with those who would attempt to embarrass the carrying out of an Act of Parliament by combined refusal to obey." It is to be hoped that Carnarvonshire and Flintshire County Councils will give thought to Mr. Humphreys-Owen's weighty words on this point.

AT the Portmadoc County School, notice was given, at the last meeting of the Governors, of a motion to reduce the fees from £5 to £4 a year. The school started, it appears, with 56 pupils, and the number is at that figure now. Four terms after the school started the number reached 82. The headmaster

reported that he would consider 70 a reasonable number for the town. The Governors have asked the headmaster to report on the nature of the commercial education given in the school. At the same time, the Governors passed a vote of congratulation to the headmaster and staff on the success of the pupils in the Central Welsh Board Examination. Surely, if the education is sound, efficient, and successful, it would be better to trust in the efficiency of the school to attract numbers than to take steps in the lowering of the fees, and in the consideration of commercial instruction, should such changes possibly tend to retard the conditions of efficiency.

CURRENT HISTORY.

WE have remarked more than once or twice in these columns on the extraordinary nature of the British Empire. Does the average stay-at-home Englishman ever reflect that he is "equal before the law" and equally subject to the Imperial Crown of Great Britain and Ireland and of the Dominions beyond the Seas with naked savages in New Guinea, with diamond-eyed, pig-tailed Chinamen in Hong-Kong, or with Basutos, Matabele, and other of the African tribes whom our Boer fellow-subjects regard as soul-less dirt? How various must be the government of this vast Empire! While here, and in Canada, Australasia, and other "self-governing" colonies, we talk big about the relations between taxation and representation, and believe that, subject to mob-violence, we may say what we like whenever we please, note that in other parts of the Empire we seem to be going back to the days of Haroun-al-Raschid and of his Christian contemporary, Karl the Great. Of Lord Milner we read that, "along the route, whenever his Excellency discovered any mistake or injustice, he immediately rectified it by telegraph, so that the results of his presence were quickly felt." To King Lewanika, King Edward said: "I will take charge of you and your people and will look upon you as my children." We are feeding daily in India over 300,000 of our fellow-subjects who are in danger of dying from famine; and this, and more, has been continuous for now over a twelvemonth. What Haroun did in one city—Bagdad—we do over millions of square miles, by means of railway and telegraph.

WE are in the habit of regarding Austria-Hungary as the example *par excellence* of polygot monarchies. Joseph II., in the eighteenth century, made shipwreck of his reign in trying to render uniform that patchwork of nations, languages, and tongues, and no Viennese statesman has since attempted that impossible task. But the need for unity is great in Austria-Hungary, and what will happen at the death of the present Emperor is a matter of constant speculation. The Dual Monarchy is not, however, the only European example of polygotism. The German Emperor has lately issued new articles of war, and they must be published, if they are to be thoroughly understood, in four languages besides German, viz., Lithuanian, Polish, Danish and French. [Ask the pupils of the upper forms for what districts of the German Empire these are respectively necessary.] Germany is trying, but in vain, to suppress these languages. Russia is attempting a similar task in Finland, but not in Siberia. We might ask ourselves why this difference of policy exists, and why, though Germany and Austria would have uniformity if they could, the British Empire, with infinitely greater variety of race and language, does not even think the attempt desirable. Is it because of the ocean?

THERE has been recently no more interesting meeting in these Isles than that which took place at the end of September at Sheffield, where the President of the Board of Trade and the American Ambassador were guests of the "Master Cutlers" of the South Yorkshire town; for in the speeches, necessarily

friendly in the circumstances, which were made by these two potentates, the public was admitted to much of the inwardness of the recent developments in the Atlantic shipping trade. We note especially Mr. Gerald Balfour's remark that "we cannot expect permanently to exclude everybody else from the carrying trade. In particular, it would be most unreasonable to expect that our cousins on the other side of the Atlantic should not claim a fair and due share of the Atlantic trade." And Mr. Choate's, that "after all that could be said in the way of sentiment or manifested in the way of affection, community of interest was the tie that had bound the two great peoples together for the last hundred years, and it would, he hoped, continue to bind them together for the next thousand." How very far away from these sentiments sound the clauses of the Navigation Acts of the seventeenth century, and the colonial policy, both internal and international, to which they led. There is a great mountain range, a watershed, between the two ways of thinking, the highest peaks of which are the capture of Quebec, the American Revolution, and the publication of Adam Smith's "Wealth of Nations." The slopes on this side that range are gradual, but they tend all in one direction.

THE manufacturers of the United States of America, having made tentative experiments in South America, are chartering a vessel which is to visit Asiatic and Australasian countries and form a floating exhibition of American products. "It is looked upon as a unique and practical opportunity for buyers and sellers to become personally acquainted, &c." Perhaps not so unique, if we may be allowed the expression, as the newspaper correspondent from whom we quote seems to think. Some of us remember reading in our English histories how, more than a hundred and fifty years ago, the South Sea Company, having the right by treaty to send one ship annually to the coasts of Spanish South America, used their opportunity to make that one ship an "opportunity for buyers and sellers to become personally acquainted," while other ships secretly supplied the *asiento* vessel with whatever might at any time be lacking in her stores. The Spaniards put up with the "smuggling" till their differences with France were at an end, and then Captain Jenkins and others found their trade beginning to be spoilt. So Anson sailed round the world, and if it had not been for the War of the Austrian Succession, there would have been some history made in the South Seas. The quarrel ended in the way that Walpole first suggested, with a prosaic balancing of cash.

RECENT SCHOOL BOOKS AND APPARATUS.

Modern Languages.

Bossuet, Les Empires; and Lettres, Maximes et Caractères du Dix-septième Siècle. Edited by L. Brandin. 50 + xi. and 42 + xix. pp. (Black.) 9d. each.—These are portions of Professor Brandin's "Grands Prosateurs du 17^e Siècle," recently noticed in these columns. The second of these booklets contains extracts from Madame de Sévigné, La Rochefoucauld and La Bruyère. The slips in the printing have been carefully corrected, and a longer letter substituted for the short one which came first in the original selections. Several good illustrations have been added in the case of "Les Empires"; but several slips have been allowed to remain (e.g., it should be *déjà* in l. 481 on p. 45; *six-vingts* in note 40 on p. v.; and "be that as it may" in note 37 on p. ix.).

Voltaire, Mélanges. Edited by F. B. Kirkman, B.A. 44 pp. (Black.) 6d.—This is a reprint of certain parts of the

same editor's "Voltaire: Contes et Mélanges," and contains "Micromégas," "Jeannot et Colin," and "Sur l'Angleterre" (shortened by a page). French notes are added, which are distinctly well put (in note 15 on p. 27 read *où*). The *exercices oraux* have been altered to some extent. We have noticed a few slips (e.g., p. 34, it should be *un groupe, avait-il*; p. 37, *Que* veut dire; p. 40, *les conditions*; English note to p. 13, *il me prend envie*).

Victor Hugo, Waterloo. Edited by G. H. Clarke, M.A. 40 pp. (Blackie.) 4d.—The well-known account of the battle of Waterloo which Hugo inserted in "Les Misérables" is here reprinted as one of Blackie's "Little French Classics." It hardly seems suitable for this purpose, as the exigencies of space have compelled the editor to reduce his notes much beyond what is required for a clear comprehension of the text; and there is no map. The little volume is not quite free from slips in printing.

Karl Zastrow, Wilhelm der Siegreiche. Edited by E. P. Ash, M.A. xvii. + 192 pp. (Macmillan.) 2s.—This is quite the best text that has appeared, so far, in the elementary section of Mr. Siepmann's German series; it presents an excellent picture of William I., with commendably little exaggeration. The style is simple and straightforward. The notes are respectable on the whole, though not free from mistakes and not always well expressed. We hope we shall not again read of "cuiquid verbs" and the "indirect object of the recipient" in a book of this kind; nor does it seem necessary to inform the English schoolboy that Victoria died in 1901. It is not quite clear what principle has been observed in compiling the vocabulary. A large number of words are not to be found there; it would have been well to indicate what classes of words have been omitted. A key to the appendices has been published.

E. von Wildenbruch, Harold. Edited by C. A. Eggert, Ph.D. xi. + 145 pp. (Heath.) 1s. 6d.—This, we believe, is the first English edition of Wildenbruch's interesting tragedy. It may be recommended for class-work as a change from Schiller, or for private reading. The editor gives a short biography of Wildenbruch and an account of the events leading up to the battle of Hastings. The notes are hardly adequate, those on prosody being quite insufficient. The English renderings are often colourless and prosy; for instance, to translate the poetic word *Brautfahrt* by "wooing tour" is inexcusable. The text is neatly and, on the whole, carefully printed.

Classics.

M. Tullii Ciceronis Orationes in L. Catilinam quattuor. Edited, with Introduction and Notes, by J. C. Nicoll, M.A. xxxix. + 144 pp. (Pitt Press Series.)—We must congratulate Mr. Nicoll on a really good school edition of the Catilines. The only point we would criticise is that notes geographical and topographical are added to those explaining the history and the text. We do not agree with him here, because we think that every boy ought to get dictionaries of biography and antiquities as soon as he begins to read the ancient authors *in extenso*. The historical introduction is specially clear and good, and shows some independent judgment.

Cicero Pro Lege Manilia and Pro Archia Poeta. By K. P. Wilson, M.A. 154 pp. (Blackwood's Classical Series; illustrated.) 2s. 6d.—This book is somewhat better than the average school-book in point of judgment. The notes in general are not so full or so elementary as they often are (although here and there we see notes like that on p. 134: "*itaque*, two words, 'and so'"). There is too much translation, however, and the labour-saving *Biographical Appendix* which is now fashionable.

The introduction is interesting and well written, but we should expect a more satisfying estimate of Cicero's complex nature, and Pompey's destruction of the pirates was far more than a "laudable achievement."

Livy, Book XXVIII. By G. Middleton, M.A., and A. Souter, M.A. xvii. + 143 pp. (Blackwood's Classical Series; illustrated.) 1s. 6d.—This is stated to be the "first separate edition of 'Livy, Book XXVIII,'" and has therefore more antecedent reason for its existence than the books we have just reviewed. The notes are on the whole good, and avoid over-illustration and excess of references. The scholarship is above the level of most school editions; but it is not always accurate. *Tempestat* is rather a season than a crisis (i. 2); and *sallus* cannot fairly be translated "mountain" (i. 6). The idiomatic *ita*, "so true was it," familiar in Plautus, is correctly translated on ix. 13; but the note should have been confined to explaining this, and the rest of the translation omitted. There is, as usual, too much translation of single words, and it is surely childish to distinguish *lēvis*, *lēvis*, and *laevus* (xx. 4). More should have been said in the Introduction as to Livy's authorities and his use of them. Authority is not given for the illustrations, one of which at least is imaginative; and the Temple of Hercules in the Forum Boarium, now called S. Maria del Sole, figures as a temple of Vesta. We have indicated on other occasions that more care should be taken with the illustrations of these new school-books.

Caesar's Gallic War. Book I. Edited by A. S. Wilkins, LL.D. Dent's Temple Series of Classical Texts. With numerous illustrations and vocabulary. xxvi. + 100 pp. 1s. net.—Prof. Wilkins's competence as an editor no one will question; and there is nothing but praise to give for the matter and manner of the introduction and notes. Neither has he fallen into the usual fault of the academician who edits for schools; the notes are not too full. The illustrations taken from ancient monuments are excellent, and the imaginative frontispiece is very creditable. The book is very cheap at the price.

The Georgics of Virgil. Book IV. Edited by S. E. Winbolt, M.A. xxxii. + 99 pp. (Blackie's Illustrated Latin Series.) 1s. 6d.—We have already noticed earlier books of the Georgics by the same editor, and repeat our commendation of the way in which he has accomplished his "Herculean task—*hic labor, hoc opus est.*" The introduction, specially excellent in its treatment of metrical questions, is here repeated, and the notes have the old conciseness and point. We are glad to see the well-known Swallow vase reproduced. In the Appendix are a piece from "Henry V." on bees, an account of "The Bee" of Maeterlinck, and translations. Has Mr. Winbolt come across "The Commonwealth of Bees?"

The Antigone of Sophocles. With a commentary abridged from the large edition of Sir R. C. Jebb. By E. S. Shuckburgh, M.A. xl. + 252 pp. (Cambridge University Press.)—We have always regarded Prof. Jebb's smaller "Ajax" and "Electra" as models for the school edition of a Greek play, and regretted that he had not dealt with the other plays of Sophocles in the same fashion. An abridgment of the large edition is another thing, and not quite so satisfactory. Many points which the schoolboy needs to be explained are not touched in an edition for scholars; and the illustrations must necessarily be on a larger scale. Mr. Shuckburgh has practically confined himself to omissions, all "controversial matter," *i.e.*, discussion of rejected views, being left out. But some such discussions are useful and necessary for all but beginners. The plan of this book, then, appears to be faulty. But what is left is of the high quality which students of Greek drama know well, and it needs no further praise from us. The book is a very good one, if not as good as

those which Prof. Jebb has himself edited for schools. We note with regret that Prof. Jebb has not widened his view of Greek syntax, which he still regards too much from the Attic standpoint. Such constructions as *μη* with the subjunctive, hinting a doubt, are not elliptical (see on 215), but, as Homeric syntax proves, independent.

An Elementary Greek Grammar. By J. B. Allen, M.A. 194 pp. (Clarendon Press.)—This book includes both accidence and syntax in small compass. It is clearly arranged and simply written, and seems to us distinctly good. Specially useful features are the conjugation of *λύω* and *λείπω* side by side, the conjugation in full of that difficult tense, the perfect passive of liquid and nasal stems, and the numerous paradigms. The book has been revised by Mr. D. B. Monro, and is, on the whole, abreast of scholarship; but a few corrections may be suggested. The feminine dual forms of the article, which are not given in the text, are in a note stated to be "found"; but although found in MS., they are not supported by the inscriptions. We do not know what authority Mr. Allen has for wholly neglecting the *ā* duals of *ā*-stems in adjectives. The examples of syncope given here are *μητρὸς* and *ἡλθον*, neither of which is synocopated. The genitive absolute is stated (p. 113) to be probably a temporal genitive to begin with, a suggestion which will not naturally explain the other uses of the genitive absolute. It is more natural to trace all to a genitive of origin or source, *i.e.*, the ablative case.

Key to Andrews' Greek Composition. Macmillan's Greek Course. 168 pp. 5s. net.—We had occasion to speak lately in praise of Andrews' "Greek Composition." We are glad to add that the Greek versions are also good, especially as specimens of idiom. They are commendably free from literalism (with a few exceptions, such as *ὥρα* for "hour," p. 127, which would not be permissible in classical Greek), and equally so from renderings which are not clear without the English. The examples of the Greek period should be useful; No. cxliiii., a rendering of a very scrappy piece of Macaulay, is an instance. It is easy to find fault with details in such a book, but much depends on taste, and the work as a whole is excellent.

Euripides' Alkestis, adapted and arranged for amateur performance in Girls' Schools. By Elsie Fogerty. Costume plates by Isabel Boners. xxvi. + 46 pp. (Swan Sonnenschein.)—This is an admirable little edition. Mr. A. S. Way's well-known translation has been used, and everything necessary for practical performance is added, stage directions and grouping, costumes and explanations for use.

The Gospel according to St. Mark. The Greek text, edited with Introduction and Notes for the use of schools. By Sir A. F. Hort, M.A., Assistant-master at Harrow School. xxxiii. + 202 pp. (Cambridge University Press.) 2s. 6d. net.—The text of this Gospel is that of Westcott and Hort, appropriately edited by the son of the latter. It seems to us to be excellently adapted for schools. The Introduction, in particular, is both interesting and adequate, well abreast of modern research. Sir A. F. Hort, we observe, believes that there was a written document as the base of the synoptic gospels. The notes are more concerned with interpretations than with language, and they seem to us both sufficient and judicious.

Edited Books.

Scott's Fair Maid of Perth. Edited by E. W. Jackson. xx. + 470 pp. (Black.) 1s. 6d.—We have said before of this series that, considered as editions, the volumes included in it are by no means remarkable for any display of editorial ability. As reading books, the whole series may serve a temporary purpose,

and, if the reading of Scott's text contributes towards any increase in the average schoolboy's liking for a great author, any edition whatever would be welcome. The introduction to this volume appears to be a careful piece of work so far as it goes: the notes are not numerous nor very illuminative: the index is far and away the most exhaustive portion of the volume, and is decidedly good.

Scott's Fair Maid of Perth. (Continuous Reader.) Edited by E. W. Jackson. xvi. + 216 pp. (Black.) 1s. 4d.—This is a deleted edition of the above—deleted in every respect, and also mulct entirely of the interest which, to a thoughtful mind unable to find anything else to be charmed with, resides in an index. Praiseworthy perhaps as far as it goes, but that is not a great way.

Milton's Lycidas. Keats's Ode to a Nightingale, and Shelley's Ode to a Skylark. Milton's Ode on the Morning of Christ's Nativity. (Blackie's English Classics.) (Blackie.) 2d. each.—Milton's poem is published here without any editor's name, Mr. E. H. Blakeney is responsible for the second in the series, and Miss Kennedy deals with Milton's Christmas Ode. These are but booklets, though from a literary point of view they might deserve the title given by some present-day theologians to much less deserving topics, "Short Studies on Great Subjects." Of course, in an educational edition one does not expect to get everything in the way of criticism, but the amount of good literary judgment which has gone to the making up of these three small volumes is wonderful.

The Celtic Wonder World. (Romance Readers II.) 155 pp. 1s. *Tales from the Greek.* (Romance Readers I.) 154 pp. 1s. *Selections from the Morte d'Arthur.* 240 pp. 2s. All edited by Clara Thomson, and illustrated by Helen Stratton. (Horace Marshall.)—In these three volumes Miss Thomson is found working with renewed energy a vein in which she has justly attained success. It must be confessed that the result is charming, and it ought to be said also that this is in no small degree due to the felicitous illustrations embodied in the text which Miss Thomson has prepared. They are in every case exceedingly well done, and are sufficiently numerous to keep the interest of children continually stimulated. The "Tales from the Greek" are happily selected, and judiciously arranged so as to introduce children to many of the old stories without in the least injuring modern conceptions of right and wrong, as classical stories are apt to do. A long selection from the "Odyssey" is exceedingly well done. The fairy stories which form the second reader are admirable, and they have the merit of being told effectively in a short space. The legend of the Leprecaun, for instance, only occupies seven pages, and the much more important story of Saint Brendan (why does not Miss Thomson spell it "Brendan?") only thirteen. Selections from the "Morte d'Arthur" "suitable to be read by boys and girls under fifteen years of age" are not the easiest things in the world to find; but this book also has been excellently arranged. The introductory matter is capital, considering the difficulty of making such an account intelligible to children. These books are emphatically books to be praised and widely used. They are certain materially to assist in the development of the imagination—a much neglected factor in the education of little people.

Kingsley's Heroes. Edited by H. B. Cotterill. xx. + 278 pp. (Macmillan.) 1s. 6d.—Kingsley's book is too well-known to need any criticism in this column. No editor has, however, included Kingsley's own preface, which makes by no means the least acceptable part of the volume; nor the least valuable, judged from a teacher's point of view. The editor therefore confines his work to making some "Remarks" at the end

instead of at the beginning of the book, to providing a very careful list of Greek names, marked according to the length of their syllables, and about forty pages of notes which are well done. This editorial modesty in dealing with Kingsley's work would not be at all out of place in many other cases of educational editors, who too often, alas! darken counsel because they forget the distinction which commonly exists between schoolmasters and literary men. The illustrations are excellent.

Shakespeare's Tempest. Edited by Oliphant Smeaton. Illustrated by Walter Crane. (Dent.) 1s. 4d.—We searched widely through this volume to find out how the editor or the publisher intended the pages to be counted, to no purpose. Mr. Smeaton supplies thirty-five pages of introduction, prints the play without any numbers except for the lines in each scene, adds sixty-four pages of notes, and then another unnumbered series of pages of glossary. It is to be presumed that these arrangements are all intentional, because everything about this edition speaks of unwonted care, but what wise purpose is served by this procedure we cannot discover. For a school edition it would almost seem as if too much artistry had been employed upon this book, to say nothing of Mr. Smeaton's adequate and careful scholarship. Mr. Walter Crane is of course a tower of strength, but his eight illustrations are but a trifling proportion of the whole. Many of the others are of unique interest, notably one of the Swan Theatre; and scores of woodcuts are sprinkled over the notes and glossary and introduction with unsparing generosity. Mr. Crane illustrates the text only. It may seem unusual to say so much about the artistic merits of this edition, but they are unique. The editorial matter is carefully arranged, and the notes are splendid. If this series of Shakespeare's plays maintains such high interest at so cheap a price, it will speedily out many others which are comparatively dull and unattractive.

History.

Explanations of Terms and Phrases in English History. By W. T. S. Hewett. 40 pp. (Elliot Stock.) 1s. 6d. net.—We cannot think what useful purpose this booklet can serve. It is incomplete (there is, e.g., no explanation of "impeachment" or "attainder" and many another common phrase); it is often incorrect, even in obvious matters (examples may be found under the titles "Confirmatio Cartarum," "De Tallagio non Concedendo," "Field of the Cloth of Gold," "Folcland," "Magna Carta," "Salic Law," &c.), and some explanations are too vague to be of any value. What, therefore, is correct cannot be relied on except by those who know enough to do without the book.

The Tweeddale History Readers. Book I. viii. + 240 pp. (Oliver and Boyd.) 1s. 4d.—The printing is clear, the illustrations are numerous and good, the history is generally correct. Forty-two stories are selected, ranging from Julius Cæsar to Queen Victoria. The speciality of this book, as might be expected from its title and place of origin, is that more than the average number of stories are taken from Scottish history. There are poetical selections, a summary, and an explanation of the more difficult words.

History in Biography. Vol. II., Edward II. to Richard II. By A. D. Greenwood. xii. + 240 pp. (Black.) 2s.—This is an excellent little book. The lives are well told, with more fulness of detail than would be expected from the size of the book. There are good illustrations, and extracts from contemporary writers, summaries, and an index. We note merely that the plan breaks down at one or two points. The social life cannot be told "in biography," and, therefore, we have three good chapters—two on the peasants of 1380 and one on the Paston letters—which depart from the original intention of the series.

We have received from Messrs. Horace Marshall and Son six *Illustrations from Lessons in English History*, mounted for use in the schoolroom. They are each about half-a-yard square, and are excellent reproductions in colour either of ancient pictures or of objects of interest. They contain respectively a shield and byrnie, King Alfred's Jewel and a drinking horn, a Viking ship, eleventh-century harvesting, William I. crossing the Channel, and the Death of Harold; the two last being from the Bayeux Tapestry. A four-page explanatory pamphlet accompanies the pictures.

English Grammar and Composition.

Elements of English Composition. (The Mother Tongue, Book III.) By J. H. Gardiner, G. L. Kittredge, and S. L. Arnold. xx. + 431 pp. (Ginn.) 4s. 6d.—More than one speaker at the recent meeting of the British Association drew attention to the notoriously inarticulate manner in which English boys express their thoughts on paper. Some of us, lovers of our mother-tongue and firm believers in its inherent educative value, have, for years past, been insisting on the same thing. But the walls of Jericho are still standing! Whenever their downfall is consummated we can point to several "rational and systematic" methods of teaching English—drawn up by American teachers! The volume under review is one of them. Those teachers who are fortunate enough to be allowed the use of Parts I. and II. of "The Mother Tongue" will scarcely need any further persuasion to purchase Book III., issued as above. To others it may be well to point out the main characteristics of this manual of English Composition. It consists of three parts. Part I. treats of the elements of composition, and gives abundant practice in the choice of words, the structure of sentences and paragraphs, and the writing of short essays and business letters. In Part II. we are introduced to the four forms of composition—narration, description, explanation, and argument. The valuable plan is adopted here of analysing selections from various well-known authors, or, in many instances, of leading the student to work out the analysis for himself. Numerous hints to teachers are interspersed. Part III. deals more minutely with the principles enumerated concisely in Part I.; it is a practical exposition of the technique of essay writing. The exercises throughout are by no means academic; indeed, the authors have made it their aim to utilise the pupil's personal experience as much as possible. Besides the exercises in the body of the book, there are twenty-five pages of supplementary ones. We know of no better manual of composition—and that, considering the activity of our Transatlantic contemporaries, is saying a good deal.

English Words and Sentences. Book I. 110 pp., 6d. Book II. 144 pp. 8d. (Blackwood.)—These books contain a large number of exercises, all drawn up with the idea of calling into activity the thinking power of children. Though they are anonymous, we feel sure that the writer must be an experienced teacher of young children. Book I. is intended for classes corresponding to the old Standards I. to III.; Book II. for the higher classes. Teachers who believe in the educative value of their mother-tongue will find "English Words and Sentences" of considerable assistance. They are far and away superior to anything else of the kind that we have seen. They are cheap—and excellent!

Science and Technology.

A Junior Chemistry. By E. A. Tyler, B.A. viii. + 228 pp. (Methuen.) 2s. 6d.—The study of chemistry in schools is best begun with the experimental examination of a few simple changes, the student being from the very first encouraged to observe accurately, to record his observations with care, and to

reason intelligently from what he sees for himself. When sufficient data have been collected, he will be in a position to understand the generalisations which are called laws of chemical combination. Mr. Tyler rather reverses this order, and attempts to explain the more important parts of chemical theory almost at the commencement of his course of work. Not until he has been expected to read about the atomic theory, valency, nomenclature, and so on, is the beginner instructed to prepare and examine oxygen and hydrogen, to make experiments to demonstrate the nature of combustion, and to carry out simple pieces of research for himself. Mr. Tyler attempts to justify his order of treatment by referring to the inadequate laboratory equipment in most secondary schools, and by advancing the importance attached in these schools to passing examinations, but we cannot hope for improvement until all teachers place the education of their pupils first, and relegate examinations to a low place in their estimation. Unless chemistry is made a means of inculcating the scientific attitude of mind, it has no right to a place on the school time-table. At the same time, it should be said that this little book contains all the information required of a candidate offering chemistry at the University Locals and similar examinations.

Introduction to Physical Science. By A. P. Gage, Ph.D. 347 pp. (Ginn.)—This is an elementary text-book written for beginners. It discusses in simple language the more important points in hydrostatics, dynamics, heat, sound, light, and electricity. Occasional description of experiments which may be carried out by the teacher are given; also, at the end of each section, a series of questions is given involving either numerical work or experimental knowledge. The book is copiously illustrated with 257 figures and a coloured frontispiece of spectra and complementary colours; it also contains full-page portraits of Lord Kelvin, Newton, Galileo, Helmholtz, Franklin, and Faraday. The book is suitable for pupils in secondary schools, if used simultaneously with a complete course of laboratory instruction.

Applied Mechanics for Beginners. By J. Duncan, W. Ex. A.M.I.M.E. xi. + 324 pp. (Macmillan.) 2s. 6d.—This little book, although primarily intended for those students who are concerned with the elementary examination in Applied Mechanics of the Board of Education, and therefore following somewhat closely the syllabus in that subject, is fortunately not limited in its contents to the syllabus of any examining body. The result is a volume which can be consulted by any engineer who is desirous of information on the principles of mechanics. At the outset we find a brief but clear account of the various measuring instruments in use in a well-equipped workshop, and the degree of accuracy obtainable by their use; this is followed by a statement of some of the more important rules in mensuration, by chapters dealing with forces acting at a point, by a consideration of beams, riveted joints, shafts, springs, mechanisms and hydraulics. A well-arranged course in laboratory work completes the book. It is almost impossible for a student to obtain clear notions unless he is able to make experiments for himself, and from them to deduce the so-called "laws," or the relation between effort and load in simple machines, &c. Hence one of the best features of the book is the introduction of numerous suitable experiments; these, together with worked-out examples and the frequent use of squared-paper, are well-calculated to give the reader a clear insight into the fundamental principles of the subject. The beginner should be on his guard against such loose modes of expression as "velocity"—"a commoner term with the same meaning is 'speed'"; "a velocity of fifteen feet per second means that in one second the body will travel a distance of fifteen feet." Fig. 197: "Velocity-time diagrams in which time being taken for abscissae and velocities for ordinates shows

at a glance all that has occurred to the train's speed." These are, however, minor blemishes, and on the whole the book is well arranged and suitable to the wants of teachers and students.

The Woodworker. Vol. I. Edited by Percival Marshall, A.I.Mech.E. (Dawbarn and Ward.) 3s. 6d.—This book is the first volume of a periodical which obviously supplies a want. The subject is certainly treated—in a cursory manner—at intervals in the various trade journals, but, so far as we know, this is the only journal which is devoted exclusively to wood-working. The craftsman, the amateur, and the designer alike, will find the book useful; while to the teacher of woodwork—either on the Sloyd or any other system—it will be invaluable. The subjects treated are very varied, and are written by specialists in a style which is clear and terse. One excellent feature of the book is the abundance of good illustrations, both working drawings and photographs; and many of these show both originality and beauty of design. We are glad to find that the success of the first volume has been such that in future the numbers will appear fortnightly instead of monthly.

Mathematics.

Differential Calculus for Beginners. By A. Lodge, M.A. xxvi. + 278 pp. (Bell.) 4s. 6d.—If the beginners who try this book are fairly intelligent and not too young, they will find it very enjoyable, and will be able to learn from it in a pleasant way all the differential calculus which is indispensable for practical purposes. The collection of examples is unusually good; the text contains plenty of graphs, a five-figure table of $\log(\sec \theta + \tan \theta)$ for each degree, and a very ingenious (if not quite rigorous) way of differentiating a^x . Sir Oliver Lodge contributes an introduction which ought to help the reader to understand the value of the calculus to students of physics. Art. 15 illustrates very clearly both the strong and the weak points of the school to which the author belongs; thus, while it is clear that he is enough interested in mathematics to feel the value of modern function-theory, he gives entirely wrong definitions of "algebraic" and "continuous"; says that "factorial x " is a discontinuous function; and seems to think that there is only one continuous function of x which has the same value as $x!$ when x is an integer. Obviously Γx and $\Gamma x + \sin x\pi$ are two out of an infinite number of such functions.

The Beginnings of Trigonometry. By A. C. Jones, M.A., Ph.D. viii. + 144 pp. (Longmans.) 2s.—In many ways Mr. Jones's book shows the influence of the reformed mathematical programme. Thus four-figure tables are provided, and the practical use of them illustrated; the general addition-formulae are deferred to a comparatively late stage; and so on. There are numerous easy exercises, and for a first course, up to solution of triangles, the book may be recommended. There are some slight blemishes which should be removed in another edition. On page 58 we are told that the diameter of a halfpenny is half an inch; on p. 51, BN—NC ought to be BN—CN (and so in other cases, if any); on p. 44 and elsewhere $180\alpha + A$ is printed for $(180\alpha + A)^\circ$. Finally, the wording of some of the examples might be improved: for instance, on p. 49, Ex. 1 is very badly expressed, and Ex. 3 is put in such an indeterminate form as to admit of any number of answers.

Elements of the Theory of the Newtonian Potential Function. (Third Edition, revised and enlarged). By B. O. Peirce, Ph.D. xiv. + 490 pp. (Ginn.) 12s.—It is needless to recommend a work which has so evidently met with approval as this. But attention should be called to the really excellent collection of miscellaneous problems on pp. 337-483. By their arrangement

and form of statement, as well as by occasional hints, they suggest methods of attack or lines of inquiry; so that they cannot fail to stimulate the mind of every capable reader. It may be added that, while Professor Peirce has avoided analytical abstractions, he has not shirked inherent difficulties for the sake of apparent simplicity.

Money and Banking: illustrated by American History. (Second Edition, revised.) By H. White. xiv. + 474 pp. (Ginn.) 6s. 6d.—This is a book that should be read not only by bankers but by the ordinary citizen, whose ideas about the nature and functions of money are often dangerously inaccurate. Mr. White is never dull: his views are sound without being pedantic; and his plan of illustrating his theses by the hard facts of experience is very effective. Book II., on Government paper money, is perhaps the most instructive part of the work. It shows with great clearness the injustice done when a straight-forward loan is evaded by the issue of irredeemable paper. This immediately leads to gambling, and ultimately robs the most deserving part of the community.

Mathematical Tables for Ready Reference. Compiled by F. Castle, M.I.M.E. 16 pp. (Macmillan.) 2d.—A table of useful numbers and formulæ is followed by four-figure logarithms and antilogarithms, natural sines, chords and tangents, concluding with a one-page table of angles at 1° interval with their circular measure and trigonometrical ratios: altogether a very useful set. The print is fairly distinct, though rather small; we should have much preferred old-faced type for the figures. And is there much use in a table of antilogarithms? Surely a table of logarithmic sines, &c., would be more valuable in its place.

Miscellaneous.

Lettres à Françoise. By Marcel Prévost. 339 pp. (Juvén., Paris.) 3f. 50c.—In this interesting volume M. Marcel Prévost discusses the character and position of the modern French middle-class girl, and has incidentally a good deal to say about secondary education in France. He takes gloomy views of its efficiency, considering it to be on a much lower level than primary education, which for the last thirteen years has, he says, been excellent. Especially he hankers after the co-education of the sexes, which, according to him, obtains in one-third of the French elementary schools, and is attended by no bad results of any kind. As is only to be expected from such a chivalrous upholder of woman's rights, he maintains that girls of the better classes should be taught the same subjects as boys, a view now almost universally accepted among ourselves, but still regarded with disfavour by the majority of his countrymen. Unfortunately he rather darkens counsel by adding that needlework, housekeeping, and apparently, accomplishments, should in the case of female pupils be substituted for violent gymnastic exercises; in fact, though he theoretically acknowledges the necessity of physical training for everybody, it occupies an almost invisible place in the programme of his ideal girls' school. By way of compensation, two hours a day are allowed for the toilette, which happily includes a liberal use of soap and water. M. Prévost advocates a sweeping reform of existing school textbooks, which in his opinion are generally wanting in brevity and clearness. It is less easy to sympathise with his enthusiasm for collections of "elegant extracts" as the sole basis for instruction in literature. He speaks sensibly of examinations as serving a useful purpose, in spite of many imperfections, and expresses himself with much judgment and good temper on various other educational questions. The book is charmingly written and allows us many interesting glimpses of French family life on its best side.

The Graphic Mark Book and Reducing Scale. By C. Marsh and H. W. Ord. (Educational Supply Association.) 1s. 4d.—The designers of this book have adapted the system of "squared" paper to marking. Marks are registered by a dot so many spaces distant from the last dot. The ruling, as usual, makes every fifth line distinctive, to facilitate the recording. In this way the addition is performed mechanically and the relative positions of the pupils can be seen at a glance. The reduction is also performed on squared paper. Suppose the marks are read off horizontally, then the reduced marks will be found as vertical heights. The zero point for both directions is joined to the intersection of the "highest mark" vertical line with the new "maximum" horizontal line. Then any other mark is reduced by "running up" the corresponding vertical line till it meets the "diagonal" drawn above, and thence across to the required reduced mark. The designers do not point out that the more complicated process of reducing to a range of marks (e.g., 24—118 to be reduced to 10—90) can be performed as easily. Here the "diagonal" must pass through the "minimum" point (24, 10) instead of the zero. The objection to the method of marking is its slowness. The designers claim that it is as expeditious as that of writing down numbers. After many years' experience in the use of squared paper we would suggest that the first mark (say 17) is recorded on the ruled paper perhaps half as fast; but later on, when the hand and eye must pass to right and left to the last dot and then add from say the 17 point, the rate is very slow indeed. We might point out that a "scale" made of a small piece of the paper itself of which the zero is placed opposite the dot greatly facilitates operations. We recommend teachers to obtain a specimen copy for a shilling, and so try how far the system aids them.

School and Examination Book-keeping. By J. Logan. viii. + 166 pp. (Longmans.) 2s. 6d.—This is a short treatise on the system of book-keeping by double entry. It appears to be very suitable for class use, and is sufficiently advanced to meet the requirements of most public examinations in the subject. There are plenty of exercises, generally of the practical rather than the easy-chair variety.

Up-to-date Tables. By Alfred J. Martin. ix. + 91 pp. (Grocott and Sherry.)—A very full and compact compendium of facts useful to professional and commercial men, especially if their field of labour is South Africa. The idea of the book is said to be to bring before all classes the subject of Imperial decimal coinage and weights and measures. The book contains so much other information that the casual reader is likely to miss the *raison d'être*, but, while there is no pocket edition of Whitaker, Mr. Martin's tables may well fill the gap.

Pattern Drawing and Design. By John Carroll. 112 pp. (Burns and Oates.) 1s. 6d.—Mr. Carroll has given us a thoroughly practical little book showing the application of geometrical drawing to the construction of patterns. The examples range from the simplest geometric borders to quite complicated designs, and are accompanied by excellent diagrams giving the constructional bases of the patterns. It is to be regretted that the exercises in which foliated and floral forms are introduced are less satisfactory than the rest of the book.

A Class-book of Easy Dictation and Spelling. Selected by William Williamson. 95 pp. (Methuen.)—The chief thing to notice about this little book is the fact that its selections are very short and very good. As they are all made from standard authors, they might well, like so many standard authors, be uninteresting; but we have tried to find an uninteresting passage, and have failed. The book is only intended as a guide to dictation, but it might well be useful for oral composition and story telling, the surest step to a true appreciation of good literature.

CORRESPONDENCE.

The Editors do not hold themselves responsible for the opinions expressed in letters which appear in these columns. As a rule, a letter criticising any article or review printed in THE SCHOOL WORLD will be submitted to the contributor before publication, so that the criticism and reply may appear together.

The Granville History Readers.

THE reviewer of the "Granville History Readers" in your columns is good enough to admit the correctness of the matter in Book II., but takes exception to some "extraordinary statements" in Book III. He says: "The Rye House Plot is invented by Titus Oates, Shaftesbury is one of the Tory leaders in Anne's reign, and the South Sea Bubble becomes bankrupt in 1720. These are some of the most obvious deviations from rigid history."

Your reviewer has been hasty. Had he read the context he would have seen that the reference of Titus Oates is a general one to the plots of the period, and a paragraph in the summary makes this reference still clearer. Authority for the statement is to be found in Macaulay's History, Chapters II. and IV. The name Shaftesbury is admittedly a misprint for "Shrewsbury."

As to the bursting of the South Sea Bubble in 1720, permit me to give an extract from Green's "Short History," page 703: "The unknown wealth of South America had acted, ever since the days of the Buccaneers, like a spell on the imagination of Englishmen, and Harley gave countenance to a South Sea Company which promised a reduction of the public debt as the price of a monopoly of the Spanish trade. It was in vain that Walpole warned the Ministry and the country against this dream. Both went mad, and in 1720 bubble company followed bubble company till the inevitable reaction brought a general ruin in its train." Mr. Lecky, in his "History of the Eighteenth Century" (vol. i., chap. 3), fixes the final launching of the South Sea Company in April, 1720, and says that the collapse of the scheme was almost immediate.

Yours, &c.,

THE REVISER OF THE
"GRANVILLE HISTORY READERS."

28, Orchard Street, W.

(1) The author of the "Granville History Readers," Book III., says (p. 110-1): "The Cabal Ministry caused many plots and conspiracies. . . . Two of these plots are very famous, and are called the Mealtub Plot and the Rye House Plot. . . . They were mostly invented by the malice of a wicked man named Titus Oates." And in the "summary" (p. 220): "Several plots occurred, the best known being the Rye House Plot. They were mostly set on foot by . . . Titus Oates." If there were a "Cabal Ministry" it came to an end in 1673. The date of the Rye House Plot is 1683. It was a real plot, not "invented" by Titus Oates or anyone else. What Oates "invented" was a (non-existent) Popish Plot in 1679. These statements are common knowledge, and are so stated in all the text-books I have come across. I can find nothing in Macaulay about Oates inventing plots in general.

(2) "Shaftesbury" may be a misprint for "Shrewsbury;" indeed, I suspected so much myself when I read the "Reader." But surely the Duke who at Anne's death-bed checkmated Bolingbroke's schemes, and received a handsome pension from George I., can scarcely be described as a "leading Tory."

(3) The statement in the "Reader" is that the "South Sea Company became bankrupt," and I so quoted it in my review.

The "Reviser" misquotes me and makes me talk nonsense. A "bubble" cannot "become bankrupt." The whole paragraph in the "Reader" is based on a misconception. The "Reviser" or "author" thinks that the "South Sea Scheme" was set on foot by *George Ps. ministers* to get wealth in the South Sea Islands and in South America. Now the South Sea Company was formed in 1711; in the worst times of the "Bubble" its shares were quoted at 135. Not only did it survive the Bubble, but it lived to precipitate the war with Spain in 1739. The "Scheme" or "Bubble" of 1720 to pay off the National Debt was a failure, but the trade with South America was profitable enough to stand the shock of this failure. I have no copy of "Lecky" at hand, but are his words, "The South Sea Company was launched in 1720?" If so, I am sorry for Lecky.

YOUR REVIEWER.

The Study of Modern Languages.

If Professor Perry is correctly reported in the press, he has been going beyond his last. He has earned the gratitude of every thinking man by his crusade against the hide-bound methods into which mathematics had fallen. Almost every school-boy is now being taught to measure, to know the value of approximations, and to draw graphs. The University of Cambridge alone keeps to its old ruts; even the Civil Service Commissioners have introduced improvements in their Army Entrance Examinations. But when Professor Perry begins to talk about modern languages, as he did in his introductory lecture at the Royal College of Science, he does not carry all teachers with him. It is currently believed that the Professor is a fluent French, German, and Japanese scholar, and he provided French and German instruction at the College for many years out of his own pocket. Yet he says: "He represented the average man to whom it might be absolutely harmful to be compelled to learn a foreign language. He hoped sometime to have a chance of pricking this compulsory foreign-language bubble." Was it not the great Napoleon who said that he who knew two languages was thereby twice a man? No wonder Sir Arthur Rucker, who was present, felt compelled to take exception to these remarks, although Professor Perry was a former fellow-professor. It is a curious fact that mathematicians and men of science are so keen about their own work that they can rarely see the good in other branches of study. There is at least one reason why every mathematician, man of science, or engineer should be compelled to learn at least one other language besides his own—to preserve him from the narrowing influences of his own profession.

DE V. PAVEN-PAYNE.

The Art of Reading.

In his address to the Educational Science Section of the British Association at Belfast last month, which I was glad to find you printed in your last issue, Prof. Armstrong touched upon a subject to which I, in common with many other parents, have been compelled to give a great deal of attention. I refer to the important question of the provision of good yet readable books for our children. Illustrated magazines are so numerous, so easily procured, and generally interesting, that many boys and girls find them sufficient to satisfy all their inclination for reading. And finding them content, it is the most natural thing in the world for us parents to take the line of least resistance and to leave them alone. When, in addition to the natural inclination to take as little trouble as possible prompting us to leave things as they are, the difficulty of selection of good books is borne in mind, and the fact that schoolmasters and school-

mistresses as a rule do nothing to help us, it seems to me that, unless help is forthcoming from the Educational Science Section itself, or some other professional body of educationists, there is little chance of improvement.

If my own experience may be taken as normal, children are apt to be suspicious of the recommendations of parents as to what they should read. They suspect a hidden desire to palm off a disguised lesson-book in the form of pleasant reading. Not only so; even when an honest attempt is made to fall in with the wishes of parents, it too often happens that there is a complete want of agreement between a parent's idea of a healthy child's tastes and the reality. It is given to the exceptional man alone to be able to place himself in the mental attitude of the youngster. I have advised boys and girls to read books which in the days gone by gave me the keenest delight, books I am able to read again now when my bitterest enemy could not accuse me of youth, but to my sorrow I have found, instead of the keen satisfaction I expected them to evince, the most palpable signs of wearisome though heroic endeavours "to get through" the volume.

Perhaps those of your readers who have been more successful than I have would be willing to send you short lists of books for children of different ages, books of which Prof. Armstrong would approve, that are really literature and can give as much interest at least as the ordinary illustrated magazine. Or, perhaps you could publish a list of typically suitable books to serve as a guide to parents who, like myself, are anxious to do the best they can for their children.

GEORGE RENTON.

[We propose to take an early opportunity of dealing with the subject raised by our correspondent. In the meanwhile, we shall be glad to publish letters from any readers who have made lists of suitable books for the leisure-hour reading of children.—EDS.]

Regulations in Science for Oxford Locals.

WILL you allow me, through the columns of your magazine, to call attention to a point in the Regulations of the Oxford Local Examinations which, I think, many teachers will consider unwise and somewhat harsh? Junior candidates can pass in neither Botany, Physiography, nor Physiology and Hygiene, without at the same time satisfying the examiners in Elementary Physics and Chemistry. In this section of the paper "Four questions of a strictly elementary character will be set. No candidate may answer more than two."

In these days of crowded time-tables and much talk (and doubtless real danger) of over-pressure, when everyone is recognising the great educational value of a science subject earnestly and not superficially taught, is it not hard on Junior candidates, —particularly girls—to be unable to make Botany or Physiography or Physiology and Hygiene a subject for examination without also acquiring enough knowledge of Elementary Physics and Chemistry to enable them to answer two out of the four questions set thereon? Surely such regulations tend to encourage superficiality or over-pressure. Or, may be, the Delegates desire specialisation to begin in the case of candidates below 16 years of age. If this be so, I think many teachers will agree with me that such a policy is fatal to the true interests of education. We wish our scholars to leave school at 17 or 18, having had a sound, liberal education, including a thorough knowledge of the elements of some science, not a smattering of many.

I think the Regulations particularly hard on girls, because, in addition to ordinary school subjects, they are generally supposed to give some time to music, needlework and art. But the feminine mind, perhaps even more than the masculine mind, requires scientific training, and I have found Botany an excel-

lent means for training girls' minds in habits of accuracy and observation, as well as a means of teaching them to appreciate "the world beautiful." If, however, Physics and Chemistry must also be taught in order that Botany may be taken as an examination subject, science will be usurping undue space on our already crowded time-table, and I very much fear that Botany will have to drop out to make way for something which, from an examination point of view, pays better.

I would further point out that, in the case of Senior candidates who take Botany, the only mention of Physics and Chemistry in the Regulations is in the sentence, "It will be assumed that candidates have an elementary knowledge of Physics and Chemistry." Presumably the little they have learnt of these subjects as Juniors is deemed sufficient. But is that little of much educational value? The Regulations relating to Juniors are not new; they have been in existence long enough for one teacher at least to see their effect on the working of a school.

I should be glad to know the opinions of other teachers on this subject.

ANNIE COOK.

Canterbury.

[WE do not agree with our correspondent that it is unreasonable and unwise to expect a knowledge of Elementary Physics and Chemistry from Junior candidates offering Botany or Physiography, or Physiology and Hygiene. In each of these branches of science little progress can be made without the preliminary knowledge to which our correspondent takes exception, and bearing in mind the age of Junior candidates, many opportunities for the study of simple physical and chemical phenomena will have presented themselves before the candidate enters upon his special study of Botany for the examination, so that there need be no overcroding of the time-table such as our correspondent fears.—EDS.]

The Training of Teachers.

IN view of the Conference of representatives of Universities and of Associations of Teachers to be held at Cambridge next month, I should like to take advantage of your columns to explain briefly how acting assistant-masters in secondary schools regard the subject. It may, I think, be taken for granted that we assistant-masters recognise the fact that a year or two in a training college, governed intelligently, in which the lecturers and masters of method were cultured men of experience, might enable us to perform our duties more satisfactorily. Nobody sympathises more fully with the young boys who form the first class of the graduate straight from the University who, with no previous experience, has to start teaching, than does the "new man" himself. Half a day in a class room with his form is quite enough to convince most men fresh from college that there is an art of education with which they are unacquainted. And after very few weeks, all such men begin to suspect that a science of education is a possibility.

But granting all this, there is a difficulty about which the advocates of training do not seem to trouble themselves at all, of which, indeed, some of them would appear to be in complete ignorance. What is very often the state of affairs when many a man at the 'Varsity takes his degree? To describe the case plainly, it may be said either that the new graduate has reached the end of his available means, or that he is in debt. Somehow to obtain funds is an imperative necessity. Is it not, then, a little cruel to give expression to vague generalisations as to the desirability of training for the schoolmaster in secondary schools for boys, and to offer no suggestions as to how the future teacher is to live during the period of training?

It seems to me that if any practical good is to result from the forthcoming Conference, the question that must be discussed at the outset, the riddle that must be solved first, is "How is food, raiment and lodging to be provided for the young neophyte?" Our colleagues in elementary schools may compete for King's Scholarships, and in this way keep the wolf from the door. Let our representatives see to it that they find some suitable substitute by means of which the young man, burning with a desire to follow in the steps of Arnold and Thring, may live during his period of probation, and it will not be long before there is established in this country a system of training teachers in secondary schools for boys which will be the admiration of the world.

MAGISTER SUBORDINATUS.

Vacation Courses in Geography.

COULD you inform me if there are likely to be any Geographical Courses for Teachers held in the Christmas vacation either at London or Oxford? I should also be glad to know the address of the Secretary of the Geographical Association.

G. A. LING.

Harrow.

I DO not know of any course in Geography for teachers which will be held during the Christmas vacation. I am very glad of this opportunity of asking those of your readers who are interested to let me know if the holiday arrangements are such that it will be possible for teachers to attend a special course in Geography either during a Christmas or during an Easter vacation. The course ought to extend over at least a fortnight, and, if possible, eighteen or nineteen days. What will be the most convenient date for beginning such a course?

A. J. HERBERTSON,

Hon. Sec. of Geographical Association.

School of Geography, Oxford.

The School World.

A Monthly Magazine of Educational Work and Progress.

EDITORIAL AND PUBLISHING OFFICES,
ST. MARTIN'S STREET, LONDON, W.C.

Contributions and General Correspondence should be sent to the Editors.

Business Letters and Advertisements should be addressed to the Publishers.

THE SCHOOL WORLD is published a few days before the beginning of each month. The price of a single copy is sixpence. Annual subscription, including postage, eight shillings.

The Editors will be glad to consider suitable articles, which, if not accepted, will be returned when the postage is prepaid.

All contributions must be accompanied by the name and address of the author, though not necessarily for publication.

The School World

A Monthly Magazine of Educational Work and Progress.

No. 48.

DECEMBER, 1902.

SIXPENCE.

A CHAPTER IN ARITHMETIC.

By SIR OLIVER LODGE, F.R.S.
Principal of the University of Birmingham.

INITIAL EXPLANATORY STATEMENT.

I AM at work on a book on Arithmetic and easy Mathematics of all kinds, written from a very elementary and practical point of view, with the object of improving the teaching of these subjects, and overcoming the natural and wholesome repulsion which is felt by children when they are presented in the ordinary way. It is not exactly a book for children, though I hope that elder children will take an interest in it, but perhaps it may be considered most conveniently as one continuous hint to teachers, and it is hoped that teachers of children will not disdain to use and profit by it, even though they are fully aware that all the facts stated in it were quite well known to them before. It is not intended to instruct them in subject matter, but in method of presentation, and in this it often happens that the main lines only are indicated, a good deal of amplification being left to be done by the teacher.

The mathematical ignorance of the average educated person has always been complete and shameless, and recently I have become so impressed with the unedifying character of much of the arithmetical teaching to which ordinary children are exposed that I have ceased to wonder at the widespread ignorance, and have felt impelled to try to take some step towards supplying a remedy for future generations. I know that many teachers are earnestly aiming at improvement, but they are hampered by considerations of orthodoxy and by the requirements of external examinations. If asked to formulate a criticism I should say that the sums are often too long and tedious, the methods too remote from those actually employed by mathematicians, the treatment altogether too abstract, didactic, and un-experimental, and the subject matter needlessly dull and useless and wearisome.

Accordingly, in spite of much else that pressed to be done, a book on arithmetic forced itself to the front and got itself written during the recent long vacation, and it has been suggested to me that a chapter here and there might be appropriate for separate publication in the first instance.

The following is one of them.

OLIVER LODGE.

No. 48, Vol. 4.]

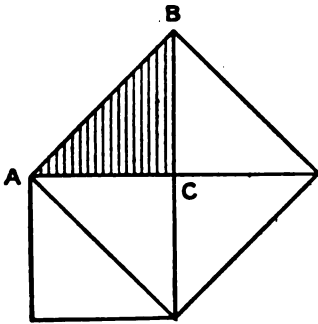
ON INCOMMENSURABLES AND ON DISCONTINUITY.

By this time it should have struck pupils with any budding aptitude for science, and for such alone is this particular chapter written, that it is strange and rather uncanny, unexpected, and perhaps rather disappointing, that magnitudes should exist which cannot be expressed exactly by any finite configuration of numbers: not only that they should exist, but that they should be common. Draw two lines at right angles from a common point, each an inch long; then join their free ends, and measure the length of the joining line (which is often called the hypotenuse of the right-angled isosceles triangle that has been constructed): that is one of the quantities that cannot be expressed numerically in fractions of an inch, *i.e.*, in terms of the sides. Its value can be approximated to and expressed, say in decimal fractions of an inch, to any degree of accuracy we please; but the more carefully it is measured the more figures after the decimal point will make their appearance: the decimal is one that never stops and never recurs. An infinite number of digits are necessary for theoretical precision, though practically six of them would represent more accuracy than is attainable by the most careful and grown-up measurement. It is therefore incommensurable, and can only be expressed exactly by another incommensurable quantity, *viz.*, in this case the square root of 2. The length is $\sqrt{2}$ times an inch, or about 1.4142 . . . inches. Draw a square upon it and it will be found to be two square inches in area. That is just the fact which (when proved) enables us to assert that any one of its sides is of length $\sqrt{2}$; since that is the meaning of the phrase "square root."

It may be proved by the annexed figure:—
where the shaded area ABC is an isosceles right-angled triangle, the area of which is repeated several times in the figure: four times inside a square drawn on the hypotenuse AB, and twice inside a square drawn on one of the sides AC. Wherefore the square on AB is twice the square on AC.

Observe, however, that there is nothing necessarily incommensurable about a hypotenuse: it is only incommensurable when the equal sides are

given. It is easy to draw a hypotenuse of any specified length, say $1\frac{1}{2}$ inches long, and to complete an isosceles right-angled triangle, but now it is the



sides that will be incommensurable. The real incommensurability is not a length, but a ratio, that it is a *number* from which dimensions have cancelled out. No length is incommensurable, but it may be inexpressible in terms of an arbitrarily chosen unit, *i.e.*, it may be incommensurable with the unit selected, and the chances are infinity to one that any length pitched upon at random will be in this predicament. It will not be precisely expressible in feet or metres, nor even in fractions of them, though it can be expressed with any degree of accuracy required.

The diagonal of a square and the diameter of a circle are not lengths chosen by hazard; and the fact that each is incommensurable with its perimeter, is a fact requiring definite proof. But the incommensurability of the relation between a meter and a yard requires no proof.

The hypotenuse of most right-angled triangles will be incommensurable with both the sides, but there are a few remarkable exceptions, one in especial, known to the ancients, *viz.*, the one where the sides are in the ratio of three to four. If such a triangle be drawn, with the sides respectively three inches and four inches long, the hypotenuse will be found to be five inches long; the more accurately it is measured the nearer it approaches to 5. It can indeed be shown theoretically—and is shown in Euclid I. 47—that it equals 5 exactly: a surprising and interesting fact.

With an isosceles right-angled triangle, however, no such simple relation holds: the hypotenuse is $\sqrt{2}$ one of the sides, and this is incommensurable, for, as we have previously suspected and may now see, *every* root, whether square or cube or fourth, or any other root of every whole number, is incommensurable, unless the number be one of the few and special series of squares or cubes or higher powers.

To prove this we have only to observe that:—

The square or any higher power of a fraction can never be other than a fraction, for you cannot fractionate a fraction into a whole.

The square of an integer alone can be an integer. Hence no integer can have a fraction as its square root.¹ Yet every integer must have a square root of some kind, that is a quantity which, squared or

multiplied by itself, will equal the given number; but this quantity, though it may be readily exhibited geometrically and otherwise, can never be exhibited as a fraction, *i.e.*, it cannot be expressed numerically by any means, either in vulgar fractions or in decimals or in duodecimals or in any system of numerical notation; in other words, every root of every integer except unity is incommensurable (incommensurable, that is, with unity or any other integer), except of those few integers which are built up by repeating some one and the same integer as a factor; for instance the following set:—

$$\begin{aligned} 4 &= 2 \times 2 \\ 8 &= 2 \times 2 \times 2 \\ 9 &= 3 \times 3 \\ 16 &= 4 \times 4 \\ 25 &= 5 \times 5 \\ 27 &= 3 \times 3 \times 3 \\ 32 &= 2 \times 2 \times 2 \times 2 \times 2 \\ 36 &= 6 \times 6 \\ 49 &= 7 \times 7 \\ &\text{and so on;} \end{aligned}$$

which class of numbers are therefore conspicuous among the others and are called square and cube numbers, &c. Every root of every other number is incommensurable, and most roots of these are too. Not roots alone but many other kinds of natural number are incommensurable: circumference of circle to diameter, natural base of logarithms, &c., &c.; everything in fact not already based upon or compounded of number, like multiples, &c.

Incommensurable quantities are therefore by far the commonest, infinitely more common in fact, as we shall find, than the others: "the others" being the whole numbers and terminable fractions to which attention in arithmetic is specially directed, which stand out therefore like islands in the midst of an incommensurable sea; or, more accurately, like lines in the midst of a continuous spectrum.

What is the meaning of this? The meaning of it involves the difference between continuity and discontinuity. There is something essentially jerky and discontinuous about number. Numerical expression is more like a staircase than a slope: it necessarily proceeds by steps: it is discontinuous.

A row of piling is discontinuous: they can be counted, and might be labelled each with its appropriate number. Milestones are also discontinuous, but the road is continuous. The divisions on a clock face are discontinuous and are numbered, and, oddly enough, the motion of the hands is discontinuous too (though it need not theoretically have been so, and is not so in clocks arranged to drive telescopes). The hands of an ordinary clock proceed by jerks caused by the alternate release of a pair of pallets by a tooth wheel, an ingenious device, called the escapement because the teeth are only allowed to escape one at a time; and so the wheels revolve and the hands move discontinuously, a little bit for every beat of the pendulum, which is the real timekeeper. The properties of a pendulum as a timekeeper were discovered by Galileo; an escapement of a primitive

¹ Attend here. It is easy to miss the meaning.

kind, and a driving weight, were added to it by Huyghens, so that it became a clock.

Telegraph posts are discontinuous, but telegraph wires are continuous. They are discontinuous laterally so as to keep the electricity from escaping, but they are continuous longitudinally so that it may flow along to a destination.

But, now, are we so sure about even their longitudinal continuity? The pebbles of a beach are discontinuous plainly enough; the sand looks a continuous stretch; but examine it more closely, it consists of grains; examine it under the microscope, and there are all sorts of interesting fragments to be found in it: it is not continuous at all. The sea looks continuous, and if you examine that under the microscope it will look continuous still. Is it really continuous? or would it, too, appear granular if high enough magnifying power were available? The magnifying power necessary would, indeed, be impossibly high, but Natural Philosophers have shown good reason for believing that it, too, is really discontinuous, that it consists of detached atoms, though they are terribly small, and the interspaces between them perhaps equally small, or even smaller. But even so, are they really discontinuous? Is there nothing in the spaces between, or is there some really continuous medium connecting them?

The questions are now becoming hard. Quite rightly so; a subject is not exhausted till the questions have become too hard for present answer.

There are several curious kinds of subterranean or masked continuity possible, which may be noted for future reference. Look at a map of the world; the land, or at least its islands, are after a fashion discontinuous, the ocean is continuous; but the land is continuous too, underneath, in a dimension not represented on the map, that is, if we attend to thickness and not only to length and breadth.

Human beings are discontinuous: each appears complete and isolated in our three-dimensional world. If we could perceive a fourth dimension, should we detect any kind of continuity among them?

The questions have now become too hard altogether; we have left science and involved ourselves in speculation. It is time to return. A momentary jump into the air is invigorating, but it is unsupported, and we speedily fall back to earth.

But how, it may be asked, does this discontinuity apply to number? The natural numbers, 1, 2, 3, &c., are discontinuous enough, but there are fractions to fill up the interstices; how do we know that they are not really connected by these fractions, and so made continuous again? Well, that is just the point that deserves explanation

Look at the divisions on a foot rule; they represent lengths expressed numerically in terms of an arbitrary length taken as a unit: they represent, that is to say, fractions of an inch; they are the terminals of lengths which are numerically expressed; and between them lie the unmarked terminals of lengths which cannot be so expressed. But surely the subdivision can be carried further;

why stop at sixteenths or thirty-seconds? Why proceed by constant halving at all? Why not divide originally into tenths and then into hundredths, and those into thousandths, and so on? Why not indeed? Let it be done. It may be thought that if we go on dividing like this we shall use up all the interspaces and have nothing left but numerically expressible magnitudes. Not so, that is just a mistake; the interspaces will always be infinitely greater than the divisions. For the interspaces have all the time had evident breadth, indeed they together make up the whole rule; the divisions do not make it up, do not make any of it, however numerous they are. For how wide are the divisions? Those we make, look when examined under the microscope like broad black grooves. But we do not wish to make them look thus. We should be better pleased with our handiwork if they looked like very fine lines of unmeasurable breadth. They ought to be really *lines*—length without breadth; the breadth is an accident, a clumsiness, an unavoidable mechanical defect. They are intended to be mere divisions, subdividing the length, but not consuming any of it. All the length lies between them; no matter how close they are they have consumed none of it; the interspaces are infinitely more extensive than the barriers which partition them off from one another; they are like a row of compartments with infinitely thin walls.

Now all the incommensurables lie in the interspaces; the compartments are full of them, and they are thus infinitely more numerous than the numerically expressible magnitudes. Take any point of the scale at random: that point will certainly lie in an interspace: it will not lie on a division, for the chances are infinity to 1 against it.

Let a stone—a meteor—drop from the sky on to the earth. What are the chances that it will hit a ship or a man? Very small indeed, for all the ships are but a small fraction of the area of the whole earth; still, they are a finite portion of it. They have some size, and so the chances are not infinitesimal; one of them might get struck, though it is unlikely. But the divisions of the scale, considered as mathematically narrow, simply *could not* get hit accidentally by a mathematical point descending on to the scale. Of course if a needle-point is used it may hit one, just as if a finger-tip is used it will hit several; but that is mere mechanical clumsiness again.

If the position is not yet quite clear and credible, consider a region of the scale quite close to one of the divisions already there, and ask how soon, if we go on subdividing, another division will come close up against the first, and so encroach upon and obliterate the space between them. The answer is, never. Let the division be decimal, for instance, and consider any one division, say 5. As the dividing operation proceeds, what is the division nearest to it?

At first 4 of course.
then 4.9
then 4.99
then 4.999; and so on.

But not till the subdivision has been carried to infinity, and an infinite number of 9's supplied after the decimal point, will the space between be obliterated and the division 5 be touched. Up to that infinite limit it will have remained isolated, standing like an island of number in the midst of a blank of incommensurableness. And the same will be true of every other division.

Whenever, then, a numerically specifiable magnitude is really hit upon by any natural phenomenon, there is necessarily a noteworthy circumstance involved in the fact, and it means something quite definite and ultimately ascertainable.

The ratio between the velocity of light and the inverted square root of the electric and magnetic constants was found by Clerk Maxwell to be 1, for instance, and a new volume of physics was by that discovery opened.

Dalton found that chemical combination occurred between quantities of different substances specified by certain whole or fractional numbers; and the atomic theory of matter sprang into substantial though at first infantile existence.

The atomic weights are turning out to be all expressible numerically in terms of some one fundamental unit; and strong light is thrown upon the constitution of matter thereby. Numerical relations have been sought and found among the lines in the spectrum of a substance; and a theory of atomic vibration is shadowed forth.

Electricity was found by Faraday to be numerically connected with quantity of matter; and the atom of electricity began its hesitating but now brilliant career.

On the surface of nature at first we see discontinuity, objects detached and countable. Then we realise the air and other things, and we emphasise continuity and flowing quantities. Then we detect atoms and numerical properties, and discontinuity once more makes its appearance. Then we invent the ether and are impressed with continuity again. But this is not likely to be the end; and what the ultimate end will be, or whether there is an ultimate end, are questions, once more, which are getting too hard.

THE NEW LONDON MATRICULATION EXAMINATION.

By SIR PHILIP MAGNUS.

THE first Matriculation Examination of the London University under the new regulations was held in September last. The number of candidates was 616, and of these 348 passed.

The percentage of passes was somewhat higher than the average percentage of the last few years; but this was doubtless due to the fact that the candidates were special candidates, and had had the advantage of selecting some of the subjects in which they were examined.

There can be no doubt that the old examination, which will be held in June next for the last time,

has exercised a considerable influence upon secondary education in this country. The effect of the new examination will be watched, therefore, with much interest. Whether the change will prove beneficial or not must be judged by results, but we cannot deny that the alterations which have been made are radical in character. The new examination is essentially different from the old in aim and purpose.

For many years, the London Matriculation has been regarded as a sort of school-leaving examination, or minor degree. It determined the curriculum of many secondary schools, particularly girls' schools. As a leaving examination, it aimed at testing the general work of the school, and was supposed to embrace all those subjects which were regarded as essential to any well-arranged school curriculum. In early days there were few, if any, options. Latin and Greek were both obligatory subjects, although a choice was permitted between French and German. Gradually, the number of subjects was lessened; but it became more and more evident that, notwithstanding the changes which from time to time were adopted, its conditions were too rigid to meet the requirements of different types of secondary schools.

As is generally known, the new regulations were adopted only after a very long discussion, and in the teeth of considerable opposition. The division of opinion arose mainly from the divergence of view as to the real purpose of the examination. The supporters of the new scheme desired that it should be an entrance examination to the University and nothing more; whilst those on the other side wished to preserve the leaving-school character of the test. The two views could not be reconciled, and it was certain that under the altered conditions of the University the former would prevail.

The changes in the character of the Matriculation were rendered necessary as much by the altered conception of what constitutes secondary education as by the introduction of new Faculties into the Universities. Indeed, the widened area of university education had not been without effect on the curriculum of secondary schools. The growth of the Faculty of Science had led to the addition of modern sides to many of our schools, and the claims of Engineering to be brought within the range of university education had given rise to a type of secondary education in which science, drawing, and modern languages were substituted for the classics. Whilst, therefore, the framers of the new regulations for the Matriculation had in view, primarily, the character and extent of the attainments to be expected from students on entering any one of the Faculties of the University, they were bound to take into consideration the different courses of instruction which are now given, or which it is desirable should be given, in the secondary schools where the students receive their preparatory training. For this reason it is claimed for the new examination that it will exercise an influence which cannot fail to be felt in the organisation of secondary education.

As an entrance examination, it was necessary that the new Matriculation should certify that the student possessed that amount of knowledge which would enable him at once to profit by the University course of instruction in his special faculty. Experience had shown that for many years, owing to the inefficient school training of the student, much of the work proper to the schoolmaster had been thrown upon the University professor. The professors complained, not without cause, that the students on entering the University had a superficial smattering of several subjects, in none of which was their knowledge sufficiently advanced to serve as a starting point for University education properly so called. In framing the new scheme, it was essential, therefore, to lessen the number of subjects and to require a more thorough knowledge of those selected. The narrowing of the range of subjects and the raising of the standard were the first principles to be aimed at in making the Matriculation a satisfactory entrance examination to the University. As now arranged, it consists of only five subjects, of which English and mathematics are alone obligatory on all candidates. In each subject, however, the standard for passing has been raised, and it is thought that the examination will be a better test of the students' knowledge and ability.

It is generally admitted that different qualifications are required as a basis of study in the several Faculties of the University. It became necessary, therefore, that there should be a wide choice of optional subjects, so that the candidate might select those of most use for his subsequent University course. A matter of primary importance which the Senate had to determine was the character of the obligatory part of the examination. The questions to be settled involved the consideration of the kind and amount of knowledge which it is essential that all students should bring with them to the University, and also the subjects of instruction which are commonly taught in all secondary schools. The two questions were really the same. In every Faculty of the University a knowledge and command of the English language and some acquaintance with mathematics are absolutely essential; and in every secondary school these subjects, in addition to one foreign language, ancient or modern, are generally taught. Indeed, whilst reading, writing, and reckoning are the common subjects of instruction in all schools, the distinctive attribute of secondary education is the additional instruction in some language other than the mother tongue. When everything is considered, it will be found that the teaching of a foreign language really distinguishes secondary from strictly elementary education.

The question whether any knowledge of experimental science should also be regarded as an essential part of a student's equipment for University instruction was fully and carefully discussed; and, whilst the opinion was generally held that the teaching of science is as necessary in all schools as the teaching of arithmetic, it was felt that the results of such teaching, in its elementary stages,

could not be fairly tested by examination, and that the practical experimental training which alone is of any educational value might even be discouraged by the attempt to fix its scope and character by an examination syllabus. For these reasons mainly, it was decided that science should not be included among the obligatory subjects of the University entrance examination. This omission marks the difference between the Matriculation considered as a *terminus a quo* and a *terminus ad quem*. For I take it that no leaving-school examination would be considered satisfactory unless it afforded evidence of the fact that the pupil had received, during some part of his school course, instruction in the methods and principles of science. The results of the teaching might not be tested by the ordinary methods of examination, but the certificate should indicate that the pupil had undergone some kind of training in nature-study or experimental physics.

Another step in advance, which the Senate believe they have taken in framing the regulations for their new Matriculation, is the discouragement of special preparation, and particularly of that concentrated system of study known as "cram." It is an ascertained fact that the majority of candidates for matriculation were prepared either by private tutors or in special classes at school. A year's preparatory work was in most cases necessary, and the boy was either taken from school for private preparation, or he was removed from the ordinary course of study and transferred to a separate class for the study of certain special subjects, and for the repetition of parts of other subjects which he had previously learnt in a junior form. In this way the old examination seriously interfered with school work. The necessity of such special preparation is almost entirely avoided by the new regulations. All set books are abolished, and the examination aims at testing what the pupil can do rather than what he can remember. He is required to show a command of the English language, the ability to write it and to understand it, and to explain in the tersest form the meaning of what others have written. He is required to show that he can reckon and use mathematics as an instrument for the solution of practical problems. Further, he must be able to read some foreign language, and must have acquired some practice in writing it. As indicating the trend of his future work, he must possess a serviceable knowledge of Latin, or of some branch of science. The examination ought to be passed with ease by any pupil who has received a sound secondary education in any one of the different types of schools which are gradually being differentiated from one another. It will be seen, too, that the examination is equally adapted to the curriculum of the classical, the semi-classical, and the non-classical school; that it is open to pupils from commercial schools, where modern languages form the chief feature of the instruction, and that it meets the requirements of pupils who have been educated in technical or science schools. On the gates of the University are inscribed: "Arts," "Science," "Theology," "Music," "Engineering," "Medicine," "Law,"

and "Economics"; and no difficulty will be experienced in selecting from the optional subjects for matriculation those which will most readily admit the student through any one of them.

It is hoped that, after a time, the London colleges will require a candidate to have passed the Matriculation, or some equivalent test, before admitting him as a regular student. Only so can the standard of University education in this country be raised to that of Germany. Since its foundation, the Central Technical College has imposed an entrance examination of a similar standard to the London Matriculation, and the difficulty of gaining admission has largely contributed to the success which the College has achieved. A similar plan, with like results, was previously adopted at the Finsbury Technical College, where, however, the conditions for entrance were less severe.

By insisting upon students passing the Matriculation before entering any one of the Colleges of the University, the competition between university colleges and secondary schools, which has done so much to lower the standard of university education in this country, will be avoided, and schools will not be tempted to keep their pupils beyond the age at which they ought to enter upon their University course.

In order that the position of the new Matriculation may be better understood, it is well to contrast it with the requirements of a school-leaving examination, such as the University of London, either alone or in conjunction with other universities, may before long institute. A school-leaving certificate should testify to the fact that the holder of it has received a sound and complete education in some one type of secondary school, under approved teachers and by approved methods of instruction. The certificate should be awarded to those persons only who had been educated in certified schools. It should indicate that the school had been examined as well as the pupil, and that both had passed the qualifying tests. The examination not only should cover the acquired knowledge of the pupil at the time when the examination was held, but should extend to his previous training and to the methods by which he had been instructed. It is evident that such examinations can only be held in connection with a system of school inspection, and should follow very closely the school work.

The question of school-leaving examinations is now under the consideration of a committee of the Senate, and I have referred to it here with the view only of showing how essentially different such an examination should be from the matriculation or entrance examination to a university. It was the confusion of the two ideas, bound up as they were in the old matriculation scheme, that led to the long and heated discussion on the new regulations. The way is now clear, however, for the investigation of the most suitable conditions for a leaving examination; and there is scarcely any question that could engage the attention of the Senate of greater importance in connection with the organisation of secondary education in this country.

THE PAUCITY OF READABLE BOOKS.

By CUSTOS.

THE great difficulty in the way of teaching the art of reading arises from the comparative paucity of readable books for young people. Text-books are not readable, and in fact tend to spoil reading; and the majority of books are written for grown-up people having considerable experience of the world. The mistake is too commonly made of expecting children to master "classics." On the other hand, we need not fear allowing advanced books to fall into the hands of children; they are the first to despise the namby-pamby stuff that is too frequently offered to them. A new literature must be created if education is to be put on a sound basis; something beyond mere word-painting is required. Books are wanted written in a bright, attractive and simple style, full of accurate information, which would carry us over the world and give clear pictures of all that is to be seen, as well as of the character and customs of its inhabitants; and books are wanted which, in like manner, would carry us back in time and sketch the history of the peoples of the earth.—Prof. H. E. Armstrong, F.R.S., in his Presidential Address to the Educational Science Section of the British Association, 1902.

MANY reasons are advanced to account for the perverted taste of the younger generation in the matter of reading. We can imagine that Professor Armstrong himself would maintain that one of the most powerful is the absence of all attempt to cultivate a rational curiosity in children. But in the passage under discussion, assuming that young people want to read because they are desirous of learning about the world, he makes the startling assertion that few "readable books" are to be procured. There is nothing to satisfy the appetite if it is strong or to stimulate it if it is weak. By "readable books" Professor Armstrong does not mean those that are clearly intended for recreative reading. Thus fiction of all kinds, even historical fiction, is excluded, and so are poetry, romance, and works of the imagination generally. Such books surely exist in large numbers, of all grades and to suit all tastes. He means books which, in a lofty sense of the words, will convey information, or, as it had better be put, will satisfy what ought to be a natural and at the same time a trained curiosity after knowledge. Text-books are for study of a formal kind, and however good they are they cannot be "readable" books. Nor will young people on the average appreciate the classics. Except in rare cases, they will not enjoy the "Decline and Fall," or even the "Short History of the English People," for, charming as the one may be and imposing as the other, the historians have before their eyes the adult and not the enquiring child. The range of selection is further limited by the exclusion of "namby-pamby" books. It is taken for granted that the child reader has acquired the mechanical art of reading and that he is used to reading alone. He is able to understand common plain English, and to him books of a very elementary kind meant for "Little Arthur" are namby-pamby, although to a younger child the caressing language employed is not unnatural. Professor

Armstrong seems to desire, in fact, a kind of modern "cabinet of universal knowledge" written for young people, but not written down to them; but no doubt he would be the first to object to the forbidding appearance of anything like a formal series.

Is there really a paucity of readable books as so defined? In the region of geography and history, to which for conciseness' sake this article is limited, there is. Natural history books may be had in abundance, and the boy who desires information on animal life can pick and choose. But if he wishes to read human history, to know about the nations and peoples of the earth, the countries they live in and their past, his choice is much restricted.

Publishers will allege that if the supply of such books is small so is the demand. The two main classes of books for children and young people are gift-books and school books. The former by their very nature are intended, as a rule, to occupy the less serious hours of their readers, or to describe and assist the peculiar pursuits and interests of childhood; and among the interests of childhood a thirst for information about the rest of the world is hardly prominent at the present time. Small wonder, then, that publishing houses do not issue the "new literature" that Professor Armstrong desires, at any rate in the form of gift-books. "Readable books," in his sense, must be sought usually among school books, or at least among books meant for school use, or if not, among books not originally designed for children but suitable in matter and language for their reading. Now the most profitable customers of the publishers in the "line" of school books are undoubtedly the elementary schools, and it may fairly be said that the requirements of the elementary school have determined and do still determine the character of the books which are written to be read by children in schools. Up to a recent date few, if any, reading books were issued for elementary schools except "readers." The "reader" is not necessarily a book to read, a readable book. It is a text-book in the art of reading as a mechanical exercise. "Readers" are intended for class use and for reading aloud. They are neatly paragraphed into numbered sections, and they contain prose and poetry, stories, scraps of natural history, and even homilies. However brightly they are written, however accurate and full they are, they are still manuals for reading and not readable books in Professor Armstrong's sense. Some of them, and especially the most advanced, contain single passages, whether extracts or original compositions, which alone, and so far as they go, would fulfil Professor Armstrong's requirements. But these "general readers," or "literary readers," as they are professionally termed, are of set purpose scrappy, and variety of subject is deliberately adopted in order to obtain variety in vocabulary and expression.

Besides the general reading-book there is another type which in title and pretensions would seem to be just the book Professor Armstrong

desires to see. They are geographical readers, purporting to describe for children the countries of the globe, and historical readers, which set out for children the history of their own country. Unfortunately, up to a recent date these books had to serve a double purpose. Their main aim was to supply reading material for learners, and to attain their object they had to be in advance of the books the class had last read. They were also intended to convey information, for it was supposed that in schools where no geography or history was taught among the ordinary lessons the scholars would pick up something from their reading-books. But it is extremely hard, when you are reading a book, which in style and language is just beyond your powers, to master at once the new vocabulary and the subject matter. As the methods of the elementary-school teacher were then governed mainly by regard for the annual examination, and as the inspector did not examine in the contents of the geographical reader, the secondary purpose of the book, to give information, was very seldom realised. Further, a large number of the readers were so badly written that they failed also in the primary aim. They were modelled on text-books, and therefore full of facts, names and figures, and some of them were no more suited for reading aloud than the lists of the Dukes of Edom.

At the present time, however, the annual examination is abolished, and the kind of reading-book that should be read is no longer prescribed by the elementary-school code. To meet the new demand books are now being issued of a far superior type to their predecessors. They are intended not to provide material for reading-lessons in the lower sense, but to be read and relished by children who are no longer struggling with long words. Many of these are of a literary character and rightly so; sometimes complete or abridged editions of reputable works of fiction or collections of poems, and occasionally extracts from a variety of literary sources. They are not the books which Prof. Armstrong wants, but the success of such series will serve to show that one can procure many books to read besides reading-books. Not only, however, in literature but also in descriptive geography, history and natural science are books gradually being published which are readable. They are no longer adapted to a specific course of geography set out for children of a defined age in a schedule of the Code. Many of them have now a unity of subject which lifts them out of the ruck of manuals. They are not disfigured by evenly trimmed paragraphs, summaries, spellings and dictation exercises. They are even casting off the form of the "reader," though published for use in schools; and in time one may hope that in the mind of the schoolboy, both at school and at home, reading may finally be dissociated from the idea of drudging through a reading-book of the old pattern.

The following is a list of the books which appear to the writer most nearly to correspond to Prof. Armstrong's requirements.

A. "Readers" which are avowedly school books.

	<i>s. d.</i>
"This World of Ours." H. O. Arnold Forster. Cassell	2 6
"The Citizen Reader." " " "	1 6
"The Laws of Every-day Life." " " "	1 6
"Things New and Old" (the more advanced volumes). H. O. Arnold Forster. ... Cassell, 1s. 6d.	1 8
"Round the Empire." G. R. Parkin. ... Cassell	1 6
"First Lessons in English Government." C. H. Wyatt. Nelson	1 6
"Outlines of English History." Dr. S. R. Gardiner. Longmans	
A leisurely and simple exposition of English history: not a text-book.	
"The Sovereign Reader." G. A. Henty. ... Blackie	1 6
Scenes from the life and reign of Queen Victoria.	
"King Edward's Realm." Rev. C. S. Dawe. Not Educational Supply Association given.	
"The World and its People." ... Nelson	1 3
A series of readers on the continents: well written.	
"Britain beyond the Seas." ... Chambers	1 6
"Geography of Greater Britain." ... Blackie	1 6
"New Geography Reader: the Continents." Macmillan	1 6
These are not enlarged text-books.	

B. Books published for school use, but not arranged, printed and bound like the ordinary "reader."

	<i>s. d.</i>
"The Story of the North Country." ... Arnold	1 6
One of a series describing local history and geography: all very well done.	
"The Australian Commonwealth." ... Arnold	1 0
"Africa as seen by its Explorers." E. J. Webb. Arnold	2 0
"History of London." Sir W. Besant. Longmans 1s. 9d. or	2 6
"A Short Geography of the British Islands." J. R. Green and A. S. Green. ... Macmillan	3 6

C. Books not intended for school use primarily but likely to interest children.

	<i>s. d.</i>
"The Voyage of the Sunbeam." Lady Brassey. Longmans, 2s. or	3 0
"A Run round the Empire." Dr. Alex. Hill. Swan Sonnenschein	3 6
"The Great Lone Land." Sir Wm. Butler. Sampson Low	2 6
"The Wild North Land." Sir Wm. Butler. Sampson Low	2 6
"Heroes of the Polar World." Hartwig. Longmans	2 0
"Hudson Bay." R. M. Ballantyne. Nelson, 6d., 1s. or	2 6
"Friends of the Olden Time." Alice Gardner. Arnold	2 6
"Rome the Middle of the World." Alice Gardner. Arnold	2 6

These two are written down a little; they give the main points of Greek and Roman history.

Besides the books in the meagre list above there are of course numerous books of adventure and of travel and numerous biographies which incidentally describe the globe and its history. But such books are not the bright, attractive yet straightforward and business-like books that Prof. Armstrong seems to desire.

The Worshipful Company of Drapers has contributed the sum of £100 towards the Commercial Education Expenses Fund of the London Chamber of Commerce for the promotion of its work in Higher Commercial Education.

THE MARKING OF EXAMINATION PAPERS.

By G. H. BRYAN, Sc. D., F.R.S.

Professor of Mathematics in the University College of North Wales.

WHERE an examination is held in one subject there is little difficulty in setting papers and framing a scale of marks that will give an equitable pass list or order of merit. All that is necessary in setting the paper is to see that there are sufficient easy questions to discriminate between the weak candidates, and that the harder questions are of a sufficiently advanced standard to prevent the better class of candidate from neglecting his higher work. In framing a scale of marks, the marks assigned to each question must, in the first instance, be proportional to the difficulty of the question, and no attempt must be made to influence the average marks, either by deducting marks heavily for trivial mistakes or by dealing leniently with serious ones.

When, however, candidates are examined in different departments, and the examiner is required to furnish numerical marks to be used as a basis of comparison, a difficulty is at once introduced. It is the usual rule in examining boards that no mark shall exceed a maximum of 100, and it is a matter of common experience that the marks of examiners in different subjects vary considerably in the way in which they are distributed over the scale from 0 to 100. The result is that, on the one hand, serious injustice is done in unduly favouring candidates who take up one subject and penalising those who take up another subject, and, on the other hand, examiners are apt to be influenced by the pressure, moral or otherwise, that is brought to bear on them to obtain a distribution of marks agreeing fairly closely with those of examiners in other departments. The examiner's object is not so much to set questions that will cover the whole range of the syllabus and to assess answers proportionately to their value as to make, say, about half the candidates obtain over fifty per cent. marks without marking anyone higher than 100, and a list drawn up with this object soon ceases to represent a true order of merit.

The only way of dealing satisfactorily with examination marks in different subjects is for each examiner to set questions and assign marks for the purpose of drawing up a first list of marks without regard to the distribution of marks in other subjects. When this first list has been drawn up, the marks should be adjusted by means of a bonus or discount calculated on the total marks of each candidate, and by this means the marks in different departments should be brought into harmony with each other, and the effects due to the peculiarities of individual examiners eliminated.

The object of this article is to suggest an efficient method of reducing scales of marks to a common standard. For this purpose the examiner, having drawn up his first list of marks, plots on squared

paper the percentages of candidates who obtain above and below 10, 20, 30, . . . 90 per. cent. marks. The dotted line in Fig. 1 shows the curve obtained on the supposition of the following distribution :—

10 per cent. below,	90 above,	10 per cent. marks.
25 " "	75 " "	20 " "
46 " "	54 " "	30 " "
63 " "	37 " "	40 " "
75 " "	25 " "	50 " "
87 " "	13 " "	60 " "
94 " "	6 " "	70 " "
98 " "	2 " "	80 " "
100 " "	0 " "	90 " "

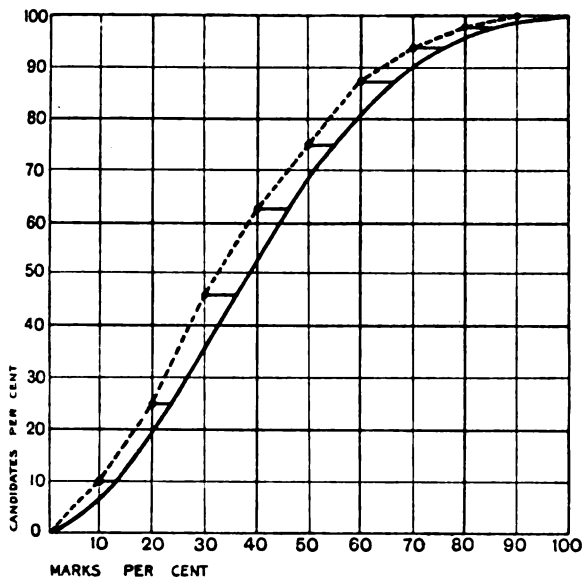


Fig. 1.

Let it be supposed that the thick line represents the curve previously agreed on and determined from a comparison of a large number of previous examinations as representing a desirable distribution. Then it will be seen, by drawing longitudinal lines, that whereas in the actual examination 10 per cent. of the candidates obtain marks from 0 to 10, in the desired distribution this percentage of candidates should obtain marks from 0 to 13; and

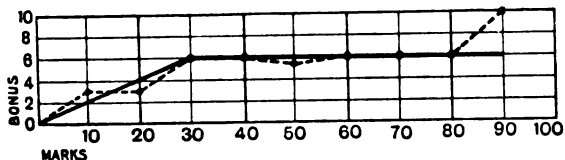


Fig. 2.

therefore 3 represents the bonus to be added to a mark of 10. Similarly, the bonuses to be added to 20, 30, . . . 90 marks are 3, 6, 6, 5, 6, 6, 6, 10.

The examiner next plots these bonuses in a second diagram obtaining the dotted curve of Fig. 2. Instead of following rigorously the zig-zags of this curve he would, however, naturally

adopt the expedient in the case considered of giving a bonus of one-fifth on marks below 30, and a bonus of 6 marks on all marks above 30; and his bonus curve would be represented by the thick line in Fig. 2.

An opportunity occurs for the examiner to use his judgment in the final selection of a suitable bonus curve for actual adoption after the dotted curve has been obtained by the method indicated above. In this the examiner will be guided by his general impression of the candidates' work, having due regard to any difficulties in the papers set, of the existence of which as real difficulties he may have first become aware in reading the candidates' work. There are many circumstances which might lead the examiner finally to adopt a bonus curve differing considerably from that determined by the construction, with the object of intentionally retaining a divergence between the marks in his subject and those of examiners in other subjects.

An essential feature of any system of bonuses is that the marks gained by a candidate on any particular question will depend on what other work he has done. In reality this may prove of great advantage. An easy question is of considerable value in discriminating between the weaker candidates in an examination, whereas its value is not very great when answered by a candidate who can gain high marks on much more difficult questions. The plan sometimes adopted of assigning nearly equal marks for questions differing greatly in difficulty has the advantage of separating the weaker candidates on the easy work, but it penalises the really good student who ought to be encouraged to concentrate his attention on parts of a paper which give proper scope for his abilities.

There is, of course, a possibility of bringing examination marks in different departments into harmony without disturbing the maximum mark by giving a high proportion of the marks for easy questions if the marks run low, and concentrating the marks on the harder questions if they run high. Apart, however, from the fact that marks so awarded no longer represent a true assessment of the candidates' relative merits according to the best judgment of the examiner, there is the more serious objection that the more nearly different questions are equal in standard the more unequally must they be marked in order to affect the general result in the way desired.

The method of the present paper is put forward as a suggestion. I have tried the effect which its adoption would have on the marks of candidates in several examinations, and the results have been highly satisfactory. It does, however, appear to me that the theory and practice of conducting examinations might advantageously be made the subject of more systematic study than it has hitherto received.

The method of plotting examination results by means of curves is not new. It has to my knowledge been frequently used by examining boards in order to test the suitability or otherwise of an examination paper to the candidates answering it. Such curves have also been used in

fixing pass standards, and the limits of marks corresponding to first, second, and third classes, where these limits have been left to the discretion of examiners. But the use of curves for reducing marks in different subjects to a common standard is practically unknown to examiners, and the object of this article is to direct attention to the matter with especial reference to scholarship and certificate examinations.

OUTLINES OF EUROPEAN HISTORY, 1763—1815.

By C. S. FEARENSIDE, M.A.(Oxon.)

A YEAR ago the Oxford Delegacy for Local Examinations separated History from Geography, and for the first time gave a special period of European History as one of the alternatives in the former subject. The new alternative has not been very widely adopted. Doubtless the novelty of the subject accounts for its apparent lack of popularity: teachers may well have wanted to see what the standard and style of the actual papers were like before embarking on the venture. Now the papers set before Senior and Junior candidates in the recent examination are most encouraging, if they are to be accepted as types of what we may expect in the future. The questions were strictly confined to outlines and essentials, and could present no difficulty to any candidate who had been kept to the highroads of history. They closely corresponded to the questions selected for the test-papers on the subject which appeared in the June number of *THE SCHOOL WORLD*; and, altogether, they are such as to attract rather than frighten teachers or private students who agree with Prof. Hearnshaw that "the history of these islands has been too long studied in isolation." It is to be hoped that the sensible character of the first papers in European History will be maintained, and that there will be an increasing number of candidates in the subject. And this, though there is at present one serious disadvantage in European History as compared with English History, and, in some degree, Ancient History, that is, the lack of continuity. Last year the period prescribed was 1095-1254 (covering part of the *earlier* alternative period of English history). This year we leap at once to the period 1763-1815 (embodied in the *later* alternative period of English history).

For better or worse, however, our period for next year is 1763-1815, which is in many ways more definite and more closely connected with our own times than that of last year. The map of Europe and of the world in our own times can be profitably compared and contrasted with the same maps in 1763, 1772, 1783, and 1815; and in nearly all such cases the reasons of the changes could be connected with outstanding events in British history. These, and other geographical points, may be made clear with the help of such small historical atlases as:—

Putzger, "Historischer Schul-Atlas" ... Velhagen 2m. 90pf.
Rotherth, "Karten & Skizzen aus der Geschichte," vol. IV., V. Bagel 7m. 50pf.
Schrader, "Atlas de Géographie Historique," vol. V. Hachette 7f.

Much of what I said about books on General European History in *THE SCHOOL WORLD* for October, 1901, applies to the requirements of the present year; but, on the whole, we are better supplied with books on modern than on mediæval history. On the other hand, there is the drawback that many books treat the period 1763-1789 with disproportionate brevity, and the period 1789-1815 at excessive length. This especially holds good in the case of American manuals of general history, which, being constructed on the assumption that the history of the United States will receive separate treatment, pay scant attention to even the European aspects of the American Revolution. With this general warning I proceed to treat the question of books under the usual three headings:—

(i.) CLASS BOOKS.—If the teacher wishes to place in the hands of his pupil the cheapest book that will serve for this particular examination (and there an end), there can be no doubt that the most suitable book is the fourth part of Mr. Edgar Sanderson's "Outlines of the World's History" (Blackie, 2s. 6d.). This would certainly suffice for Junior candidates, and it might do for Seniors. More advanced, more trustworthy, more valuable as a permanent acquisition, and also more expensive, is Prof. Lodge's "Modern Europe" (Murray, 7s. 6d.). This is one of the best historical manuals made in Great Britain; and it needs comparatively few additions and alterations to convert it into a first-rate text-book. Either Freeman's "General Sketch of European History" (Macmillan, 3s. 6d.), or G. B. Adams' "European History" (Macmillan, 6s. 6d. net), would be found to furnish a useful outline-guide to either of the large books named. The only book moderate in size and price which I can think of as deserving consideration as a class-book alongside of Sanderson and Lodge is Prof. Myers' "The Modern Age" (Ginn, about 5s.). This is not yet published, but only announced; and I venture to mention it on the assumption that it will be as good as the same author's "Middle Ages" (recently reviewed in these columns). The strong point in favour of Myers, as against either of the books selected above, is that it contains at the end of each chapter a select list of books recommended for supplementary reading.

(ii.) TEACHERS' NECESSARY BOOKS.—The teacher will need a longer manual than his class uses, a good date-book, and a set of historical maps. The longer manual will be found in two volumes of Messrs. Rivingtons' "Periods of European History" (6s. net each), dealing with this period, viz., A. Hassall, "The Balance of Power, 1715-1789," and Morse Stephens, "Revolutionary Europe, 1789-1815"; and as a substitute for or (better) supplement to this last may be named J. H. Rose,

"The Revolutionary and Napoleonic Era" (Camb. Univ. Press, 4s. 6d.). To the various date-books discussed in my former article there is now to be added the scholarly "Annals of Politics and Culture, 1492-1899," compiled by Mr. G. P. Gooch, under the superintendence of the late Lord Acton (Camb. Univ. Press, 7s. 6d. net). The maps included in the Spruner-Menke and Schrader historical atlases can be obtained separately: particulars and prices can readily be obtained of any intelligent bookseller. Perhaps one useful compilation may be added to these "necessary books," viz., Archibald Weir, "Historical Basis of Modern Europe, 1760-1815" (Sonnenschein, 4s. 6d. net).

(iii.) SUPPLEMENTARY BOOKS.—The minimum cost of these "necessary" books is twenty-five shillings net, not allowing anything for maps. If any teacher be zealous enough to spend about as much again, he might most profitably purchase some of the more readable or less accessible source-literature of the time. In such literature this period is particularly well equipped. To confine ourselves to books in English, one may mention Gibbon's "Autobiography" (the "Letters" are more expensive); Burke's "Speeches on American Taxation" and "Reflections on the French Revolution" (all well edited by Mr. E. J. Payne for the Clarendon Press); Arthur Young's "Tour in France" (Bohn's Library); the "Poetry of the *Anti-Jacobin*" (Morley's Universal Library); Southey's "Life of Nelson." There are also many documents of the period available in cheap and handy form. The most useful set to begin with are the following books of "Translations and Reprints" issued by the University of Pennsylvania (1s. or 1s. 6d. each): "French Philosophers of the Eighteenth Century"; "Typical Cahiers of 1789"; "The French Revolution, 1789-1791," "Napoleon and Europe." These may be supplemented by the still cheaper reprints in the "Old South Leaflets" and "American History Leaflets," full particulars about which can be obtained from the American School and College Text-Book Agency, 20, High Holborn, W.C.

All these books, be it noted, will be found permanently useful in giving lessons in English History: they will not be so much waste paper after next June.

In addition to all these, there are the large standard works of Alison, Lanfrey, Lavisse-Rambaud, Lecky, Mahan, Michelet, Rose, Seeley, Stephens, Sybel, Taine, Thiers, Tocqueville, which would naturally be consulted in a good library. For guidance to such books I must refer in general terms to the bibliographies in such books as Sonnenschein's "Best Books," the manuals of General History written by Professors G. B. Adams, F. R. Colby, and G. P. Fisher, and the forthcoming volume of Prof. Myers.

(iv.) CHIEF TOPICS OF THE PERIOD.—These may be roughly ranged in five groups, each of which has become conventionally known as a revolution.

(1) *The Eastern Revolution.* Map of Northern and Eastern Europe in 1763, 1772, 1795, 1807, 1815. Causes and course of the decline of Poland, Sweden and Turkey, and of the corresponding rise of Russia, Prussia and Austria. Various partitions of Poland. Their connection with the relations between (a) Frederick II. and Joseph II.; (b) the Central Powers and Revolutionary France. The Armed Neutrality of the North. Transfer of Finland from Sweden to Russia and of Norway from Denmark to Sweden.

Documents: Treaties of Kutchuk-Kainardji and Tilsit.

(2) *The American Revolution.* How did the Seven Years' War help to bring about the American and French Revolutions? Choiseul, Chatham and Vergennes. Causes and stages of the American Revolution. Connection with the Eastern Question. Why, when, where, and with what results did the Bourbons intervene in the Anglo-American War?

Documents: Stamp Act, Declaration of Independence, Peace of Versailles.

(3) *The French Revolution.* Economic, political and philosophic facts and ideas at the bottom of the movement. Voltaire, Rousseau, Turgot, Necker. French Finance and Feudalism. The States-General. Stages of the First French Revolution down to 1795. Mirabeau, Sieyès, Girondins, and Jacobins. Causes and Effects of Foreign Intervention. French Constitutions. The Crusade on behalf of "Liberty, Equality, and Fraternity." Opening of the Scheldt. Reign of Terror. The Directory. Collapse of various Coalitions against France. Rise of Napoleon Bonaparte. Expedition to Egypt. Return and Overthrow of the Directory. Consulate. Second Armed Neutrality. Treaties of Lunéville and Amiens.

(4) *The Napoleonic Revolution.* Bonaparte's great colonial schemes and domestic reforms. Renewal of Anglo-French War: Trafalgar. Renewal of Austro-French War: Austerlitz. Franco-Prussian War: Jena. Franco-Russian War: Friedland. *Peace of Tilsit.* Continental System. Attempted suppression of Neutrality in Europe. Canning's attack on Copenhagen; Napoleon's on Lisbon. Peninsular War. Anglo-American War. Moscow Expedition. Wars of Liberation. First Fall of Napoleon. Congress of Vienna. Talleyrand and Metternich. Hundred Days. Waterloo Campaign. Settlement of Europe.

(5) *The Industrial Revolution.* Improvements in Agriculture (cattle, manure, rotation); in Industry (spinning, weaving, smelting); and in application of Power (running water and steam); and in Means of Communication (canals, hard roads, railroads, steamboats). Great Britain gets the start of Continental Europe in Industry as in Navy: hence her ability to withstand Napoleon.

Dent's Andersen in German. Edited by Walter Rippmann. Illustrated by T. W. and C. Robinson. 219 pp. 2s. 6d.—Following up his other excellent work as an exponent of the *neuere Richtung* in modern-language teaching, Professor Rippmann has added an edition of selected tales of Andersen in German. Our old friends "die Nachtigall," "die wilden Schwäne," "das hässliche junge Entlein," which are included, make a brave show in their new garb, and the graceful illustrations contribute to make up a pleasing volume. In accordance with the new method, all explanations, grammatical exercises, &c., are given in German, but occasionally English, French and Italian equivalents are supplied in the vocabulary. We do not altogether see the necessity of this. Something should always be left for the teacher. On the whole, we consider the book eminently suitable to be placed in the hands of pupils who have had a year's tuition in German along reform lines.

SCHOOL FURNITURE AND EQUIPMENT.

WITH SPECIAL REFERENCE TO BOYS' SCHOOLS.

By J. W. JARVIS.

Headmaster of St. Mark's Training College Schools,
Chelsea, S.W.

III.—Furniture and Individual Work—Copying Machines—Cupboards—Museums—Blackboards—Cloakrooms and Lavatories.

THESE remarks have brought us to a concrete difficulty which is now appearing in our schools, viz., the question of discipline while dealing with the individual rather than with the class. The trend of the recent discussion at Belfast shows that the teachers of the future are to deal with the individual and not with the class, but at present the furniture of the schoolroom is provided for the class and not for the individual. We must begin to separate our pupils, they must learn to work at tables—the kindergarten table with its chess square was the forerunner of this—the dual desks will have to be cut in two, and the child will have to learn the arts of patience and self-restraint. The old discipline will disappear and the class room will no longer preserve its orderly look. Yet, under the appearance of confusion, let us hope that the new direction is an earnest endeavour to develop the individual in the paths of intelligence and enterprise. Whatever furniture we put into our rooms, we are to bear in mind that in the future the need of the individual and not that of the class will be taken into account; and with the alteration in furniture will come the alteration in discipline; and then it ought to be possible for each boy to be doing different work and yet forming a class; for some to be drawing a map, others to be working out a table of population or distances, some writing notes, and a group standing round a good-sized globe and asking and answering questions. Certainly, in any circumstances, the younger the children the more frequently they should see and be constantly familiarised with the globe. A Whitaker's "Almanac" should be readily accessible to the boys in the senior forms.

On the wall of every school should be placed in a prominent position an HONOURS BOARD—black, with the letters in gold—for the names of boys who have behaved with distinction during their school life, or who have in after life distinguished themselves by serving their country. These records have a value, not only by gratifying those whose names are placed there, not only as incentives to work, but as a bond between the past and the present, the development of which adds to the stability of a nation.

So far, our maps and diagrams have been illustrations upon surfaces, that is, two dimensions only have been considered. It is advisable to make the pupil familiar with the solid, and the passage of the imagination from the plane to the solid is extremely difficult. In reality, the passage itself is

simple, but the process of thought afterwards presents so many difficulties that boys readily abandon the task. To avoid this and also to make a more permanent impression, models of geometrical shapes; of anatomical structure, *e.g.*, the eye; of astronomical phenomena, *e.g.*, the tellurian, a device to show the rotation of the earth accompanied by the moon round the sun; the compass, and the barometer, should be placed within the reach of the pupils. Models made by the boys should be accepted and included in the school apparatus, and no effort should be spared to develop their ingenuity in any direction.

The COPYING MACHINE¹ is one of the most useful devices a school can possess, and not one, but several are recommended. They are generally wanted by all the masters at the same time, *i.e.*, towards the end of the term, and very often common ownership means loss of the component parts. Hectographs, *i.e.*, a glycerine jelly with a negative written by special ink, work satisfactorily if attention is paid to temperature, but the copies curl up and the cleaning of the jelly afterwards is a



Fig. 1.

tiresome process. The Duplicator is the most useful form of this instrument. The paper on which the negative is written consists of a sheet of tissue paper soaked in paraffin wax. The writer's aim is to scratch off the wax by using a hard, steel point, made exactly like a blacklead, on a very finely corrugated plate. As the paper is written upon this rough surface the wax comes off at the points of contact, and afterwards ink is pressed through by a roller. One hundred copies can be taken off quite easily in half-an-hour, and, as the printing machine rises mechanically by a spring each time (Fig. 1),² much trouble is saved. The secret of the whole of these stencil duplicators is known when the writer of the negative realises that he must not write, but scratch. And the difference between writing and scratching is this. In writing, we press heavily when we come down and lightly when we go up. In scratching, we press equally up and down. Once learn this and there will be no failure in these

¹ See also "Methods of Manifolded by Copying Machines." THE SCHOOL WORLD, June, 1900.

² Fig. 1 is used, with permission, from the catalogue of Ellam's Duplicator Co., and Figs. 3 and 4 from that of the Educational Supply Association, Holborn Viaduct, London.

machines. Unless it is an examination paper, boys should always do the multiplying—the moral discipline of handling an inky machine and yet being obliged to keep your hands clean is invaluable. It

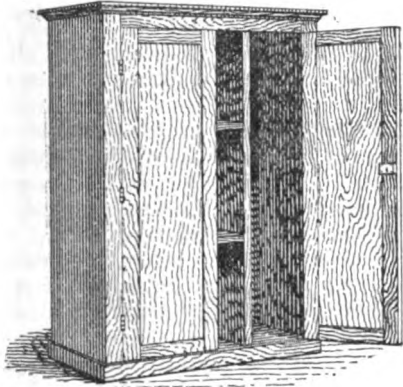


Fig. 2.

is only exasperating to a teacher. The most economical way of furnishing a school with these duplicators is to purchase a slab and stencil for each master, and only one or two printing presses to be used in common. Among the many things which can be printed are notes of lessons given, examination papers, lists of books to be purchased or read during the term, maps, and last, but not least in importance, the syllabus of the term's work, which should be in the hands of the pupil at the beginning of each term.

In each class room there should be a good-sized CUPBOARD, made as nearly dust-proof as possible, not very deep, and with properly arranged internal fittings. The shelves should not run across the cupboard, but should rest on a partition, as in Fig. 2. The recess formed by this arrangement is for maps, map-hooks, pointers, &c., which need putting away. One shelf of this cupboard should

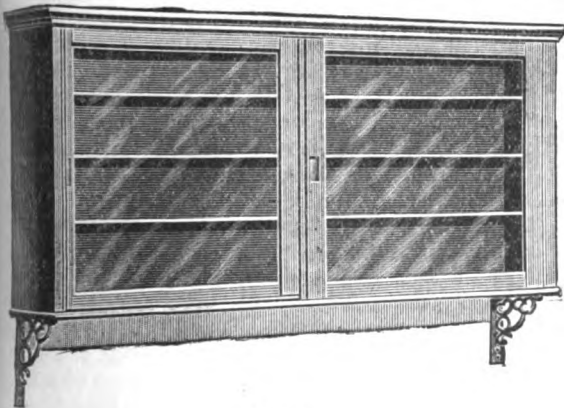


Fig. 3.

be reserved for the reference books which ought to be found in each class room; a pronouncing dictionary arranged to suit the form in which it is used, an atlas and gazetteer, a Whitaker's "Almanac," a Bradshaw's "Railway Guide," if the

geography course includes England, and one of those books on boys' sports and pastimes in which the settled rules of games are laid down. Spon's "Workshop Manuals" will be found a source of delight, and as valuable to a schoolboy as Mrs. Beeton is to a good housewife. There should be at least two keys to this cupboard—one on the master's ring, and the other in charge of the caretaker, and if glass partitions can be placed in the door so much the better. Visibility is a grand specific for untidiness. Specimen or museum cupboards (Fig. 3) should be placed in central halls or corridors, not in class rooms. Their arrangement should be such that they can be consulted at all times during the day without disturbance. The value of a specimen lies in its availability at the critical moment, for when this has passed so many other ideas flash through the schoolboy's mind that the necessity for consulting the object has passed away, never, probably, again to recur. All kinds of cupboards are made by manufacturers, and their selection depends upon the amount of room at the disposal of the master. But never, on any account, purchase a cupboard so arranged that in getting out one specimen another stands a chance of being knocked over. The writer knows to his cost of one museum cupboard which is never opened because of the nuisance of getting out and putting back, and the extra work which it involves. Elaborate museums are not desirable; odd specimens are not wanted, but sequences are really necessary. Stages in manufacture and production, typical fossils (not exceptions) of each order of strata, and representatives of classes, form the most useful and valuable exhibits, and all the rest can be left to the local museum. An ideal school-museum is to be seen at Charterhouse, Godalming, and happy are the boys who can spend an hour there.

Upon BLACKBOARDS much thought and labour has been spent, and there are all sorts of devices, both in material, in framing, and in placing, submitted to the rather bewildered master by school furnishers and architects. If the lighting allows, a blackboard running along the wall, with a very narrow shelf to catch the chalk dust and bits of broken chalk, is a capital arrangement. Work can be kept on it for some days, and the boys can and ought to use it. If not, an easel and a light blackboard are recommended. It is easily put up and taken down, and can be moved to suit the light and the pupils' convenience. Heavy blackboards and easels are undesirable and sometimes dangerous. Blackboards which work in frames like the sashes of a window and placed behind the teacher's desk are useful if they are skilfully built, if not they have a heavy and awkward look and spoil the appearance of the room. Glass is an excellent material to write upon. It should always be attached to the wall and never movable. A blackboard cloth, patented by Grayston, is useful because it can be rolled up, carried about and written on upon a table. Framed cloth works loose and does not last long enough to be recommended. By far too little use is made of coloured chalk. Change of colour is very effective in fixing a phrase

or a line in a sketch on the memory, and the chalk box should contain an assortment of colours. This box should be accessible all day, but it should only contain small quantities of chalk at a time. Too much leads to waste, and boys are very fond of using small pieces as pellets if it is thought their loss will not be noticed.

A pair of COMPASSES well made at the screw should be kept in each class-room, and a ruler marked in feet and inches at least the length of the width of the blackboard is also necessary. Neat work should always be presented to a class, and headmasters are urged to see that their staff is supplied with the proper materials to secure it.

DUSTERS are difficult things to manage; some prefer brushes, others those made from cotton or woollen waste. Whichever is chosen there should be three dusters in each classroom, one for ink, one for chalk, and one for dust, and each should be rigidly kept for these purposes. At weekly or fortnightly intervals they should be cleaned, and it should be the caretaker's duty to collect the dirty and to distribute the clean ones. The blackboards require regularly washing in lukewarm water, and should be repainted when they assume that familiar dirty-gray appearance.

LAVATORIES, cloak-rooms, and lockers are in the majority of cases provided by architects, and the schoolmaster has no option but to accept them. The architect, however, is kindly asked to put up pegs with metallic numbers attached to them (Fig. 4), not to give us two rows of pegs one above the other; to place in the cloak-rooms at proper intervals plain strongly-made umbrella stands; and to separate each coat peg by a narrow wooden partition, so that each boy has a compartment of his own. The panels of the doors should be made of open wire-work, and, indeed, the whole of the cloak room should be as open as possible in order that the tendency to rough play among the boys shall be prevented. Spring taps are the only ones allowable for lavatory basins. The basins should be of large size and fixed in slates low down so that the boys can easily dip their heads in them. The drainage arrangements ought to be as wide as possible, so that any obstruction in the pipes can easily pass through and no stoppage occur.

In conclusion, given the best appliances and the most complete outfit, do not expect these things to produce results. There is nothing in school equipment or furniture which will make up for the personality of the teacher or which will take the place of the spirit of the work. It is in its subtler aspects that we want results. The world creates an external excellence; it falls on us to sow the seeds of the inner or better life.

THE PROPOSAL TO MAKE GREEK OPTIONAL IN RESPONSIONS AT OXFORD.

By the Rev. F. J. Lys, M.A.

Fellow and Tutor of Worcester College, Oxford.

THE battle of November 11th had been awaited with more interest than any University business has excited since the attempt to secure degrees for women, and yet there was an air of unreality about the debate, as if it were felt that few members of Congregation had come with minds assailable by argument, and that it was only necessary to make a decent parade of oratory on either side before counting votes. Something of the same feeling had frozen the springs of pamphleteering activity, which, on the women's question, had been in full flood. There had been an appeal against the change in the summer term, and a circular issued in favour of it early in November. A meeting was also convened by one or two opponents of it in order to elicit the opinions of some of those who are specially interested in the examination in the New Testament, which is part of Moderations; since it was felt that if Greek were made optional in Responsions it could not be enforced on all candidates in later examinations: this meeting, however, was found to be by no means unanimous. With these exceptions, it was chiefly left to distinguished headmasters and other non-residents to endeavour to influence Congregation through the newspapers.

The resolution was drawn in the following form: "That candidates shall not be required to offer both Greek and Latin. . . in Responsions." Other supplementary resolutions indicated a way in which Council proposed to give effect to the first.

Among the signatories of the circular recommending the change were: Sir W. R. Anson, Prof. Pelham, Mr. A. Sidgwick, and the two members of Congregation who may claim between them to have most knowledge of the working of the public schools, and of the secondary schools of the country generally, Mr. P. E. Matheson, Fellow of New College, the Oxford Secretary of the Oxford and Cambridge Schools Examination Board, and Mr. H. T. Gerrans, Fellow of Worcester, Secretary of the Oxford Delegacy of Local Examinations.

The main contentions of this circular were that such knowledge of Greek as is, or can be, exacted in Responsions is not enough to show fitness for university studies, or to have much, or any, value in itself; that to require it of candidates trained on the modern side of a school is vexatious and useless; and that the modern development of other branches of study, already recognised in the schools, should also be recognised in the University. It was also maintained that the acceptance of the resolution would not seriously diminish the study of Greek in the country.

There was a very large muster of Congregation in the area of the Sheldonian Theatre for the

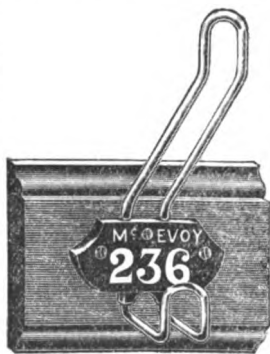


Fig. 4.

debate. The resolution was introduced by Mr. Matheson in a speech which, if it lacked rhetorical animation, was in lucidity of statement perhaps the best that Congregation has heard for several years. He avoided a discussion of general principles, and explained that Council had raised this question thinking it imperative for the University to consider whether, as a national institution which should complete and continue the curricula of all secondary schools, it ought not to make some change which should give to modern studies the encouragement of which they were in urgent need. An examination in Latin, Mathematics, and a modern language would be a sufficient test of a liberal school education; the abolition of compulsory Greek would make it possible to exact a higher standard in the subjects of the new Responsions; and, since there is a real solidarity in education, the impulse given to other studies would react on classical learning. The change would facilitate the differentiation of schools, which was much wanted, but would nevertheless not oust Greek from so many as was predicted.

The Rev. L. R. Phelps, Fellow of Oriel, replied. He said that there was high authority among the headmasters for thinking that Greek was only kept alive in the schools by the requirements of the Universities; that if it were made optional here the headmasters would no longer be able to hold out against the short-sighted utilitarianism of parents. The extinction of Greek in schools would cause it to dwindle in the University, and ruin the classical course to which Oxford has owed much of its prestige, and for which, as the best liberal education to be obtained, the best men now come. As to boys who found Greek difficult, no shuffling of the subjects would increase their industry; they objected not to Greek but to the effort involved in acquiring anything hard.

The President of Trinity, Prof. Pelham, then said that the real question was whether any sane man could maintain that Greek was a necessary part of a liberal education, and there was only one sane answer.

The Warden of Keble, after objecting to the ambiguity of the resolution, pleaded that the University ought to beware of giving the country a less educated clergy.

After some inquiries as to whether the promoters of the resolution would pledge themselves to restrict the scope of it to Honour men, votes were taken, and the proposal was rejected by 23 votes—166 to 189.

It must be observed that, as in the case of the attempt to procure university recognition of women's studies, this resolution, whether owing to the misjudgment of its friends or to the subtlety of its enemies, was proposed by Council in the form in which it was least likely to be carried. If Council had proposed to excuse from Greek in Responsions only those candidates who should obtain Honours in Mathematics or Science, the proposal would no doubt have been accepted by Congregation. As it was, the promoters of the resolution, both in their pamphlet and in their

speeches, gave the impression that their real intention was to make Greek optional for passmen as well as class-men, and the limitation to the latter was in the nature of an after-thought and a concession.

The difficulty of enforcing such a limitation has been much exaggerated, and is, in fact, purely imaginary. Either a certain modicum of Greek or else certain classes in Final Honour schools could be required of all supplicants for a degree; and in default of the prescribed class a candidate would have to take up the necessary Greek before he could take a degree. The Greek of pass Moderations may already be avoided in this way. It may also be noticed that Greek is, of course, not required for *membership* of the University at present, since a college may matriculate a candidate on any examination it chooses, or on none.

The only other remark for which I have space is that a vote of Congregation does not necessarily represent the opinion of the teaching staff and governing bodies of the University. It is probably not generally remembered outside Oxford that Congregation includes all masters of arts resident in the town. Many who but for the accident of their place of residence would only be members of Convocation represent academic opinion as much or as little as if they lived hundreds of miles from Oxford; and but for these urban votes, which have lately increased in number, the resolution would probably have been carried. Lastly, having been lost by so narrow a margin, the proposal is likely to be brought forward again in some form at no very distant date.

CAMBRIDGE CONFERENCE ON TRAINING.

THE training of teachers in secondary schools has, up to the present time, been regarded for the most part as the fad of harmless enthusiasts, some of whom have essayed to train others to do that which they have failed in doing themselves. Here and there a headmaster or educationist of conspicuous position and ability, such as Canon Bell, of Marlborough, and Mr. Arthur Sidgwick, of Corpus, Oxford, have gained attention by their insistence that there has been an almost irreparable waste through the employment of untrained teachers; but they have been few in number, *voces clamantium in deserto*. Academic resolutions have been passed in conference approving of the principle, though the authorities of our great public schools have ignored the practice. Now, however, all this is changed, for, by reason of the Draft Order in Council for the Registration of Teachers, it will be necessary hereafter that professional training be taken into serious consideration.

In July two headmasters approached the University of Cambridge with a view to arrange for a conference upon the subject. They were met

with great cordiality by the late Vice-Chancellor, Dr. Ward, the Master of Peterhouse, and under his auspices, with the assistance of a small committee of resident Fellows, the preliminaries of a conference were arranged. This met in the Senate House on Friday and Saturday, November 14th and 15th, under the presidency of Prof. Chase, President of Queen's, the new Vice-Chancellor. His wise conduct of affairs, and his generous hospitality at the lodge of his college, backed up as it was by the hospitality of other colleges and dons, and by the admirable organisation of Dr. Keynes and Mr. Oscar Browning, the Secretaries of the Committee, made the meeting quite a remarkable success.

There were divergences of opinion, of course, but a wonderful breadth of view was shown, and a grasp of opposing arguments which must have impressed the layman with the real capacity of the present members of the teaching profession. The representation of different interests was complete. All the Universities, the Headmasters' Conference and Association, every other educational society for masters in secondary schools, and administrative bodies sent members, fifty in all, to meet about a dozen distinguished, specially invited guests, among whom were Sir John Gorst, Mr. Arthur Acland, Prof. Armstrong, Mr. Bruce, and Mr. Sadler, of the Education Office. No resolutions were passed, but at the end of each session Sir Oliver Lodge very clearly summed up its conclusions.

Sir Richard Jebb, in an opening paper, described the antecedents, purport and bearing of the Order in Council, and the three alternative systems of professional training were considered. Mr. Arthur Sidgwick and Mr. Oscar Browning advocated a course of training at a university; a paper by Mr. P. A. Barnett dealt with training at a non-residential training college for secondary schoolmasters; and the Headmasters of Haileybury, Westminster, and Owens School, Islington, discussed a system of student teacherships in secondary schools, recognised for the purpose by the Board of Education.

The discussion on all these points, as indeed throughout the Conference, rose to a very high level of debating power. There was hardly a speaker who had not something to say worth hearing, and who failed to say it well. The balance of opinion, however, on systems of training was clearly in favour of the combination of training at a university or at a non-university residential training college (there being a strong prejudice in favour of the former) with a period of probation as a teacher at a secondary school. This plan was proposed by the Master of Marlborough College, and warmly supported by the Headmasters of Clifton and Shrewsbury, and such experienced university representatives as the President of Magdalen, Oxford, Mr. Matheson, and Professor Woodward.

The papers of Canon Bell and Mr. Easterbrook were especially noticeable, as containing practical proposals for the adoption of the plan suggested:

the latter dealing with the subject with personal experience of the Training College.

Financial and other economic questions connected with the training of teachers were dealt with by Mr. Hobhouse, M.P., and Mr. Henry Lee-Warner, as affecting local authorities; by the Archdeacon of Halifax and the Headmaster of Chigwell, as relating to governing bodies and headmasters of schools; and by Mr. J. L. Holland, Chairman of the Assistant-masters' Association, and Mr. F. Storr, as concerns candidates for assistant-masterships. Two or three interesting economic principles were asserted, such as (1) the necessity of aiding teachers to obtain the necessary training by means of scholarships; (2) the encouragement to them to take the extra burden on themselves by the prospect of higher remuneration and more secure tenure; (3) the supremacy of the Universities in the matter; and (4) the almost inevitable closing of many of the smaller provincial grammar schools, with a combination, or even pooling of their endowments. Not the least interesting part of the Conference was a very admirable speech by Mr. Acland during the former session, and a cheerful piece of optimism from Sir John Gorst in proposing a vote of thanks to the Vice-Chancellor for his presidency.

THE REIGN OF QUEEN ANNE.¹

THE reign of Queen Anne has many aspects. The war which almost completely fills its years may be studied either as a part of the diplomatic history of Europe or as a chapter in the history of the art of war, or, again, as an early stage in the Anglo-French American duel. The parliamentary politics of the period may be regarded as one of the last chapters in the history of religious strife in England, or as an early stage of the constitution in its modern form, with annual meetings of Parliament and a Cabinet. The literature of the period—and to many of us this is its best known feature if not the only "interesting" one—may be studied as pure literature or as part of the politics. And all these departments of the history are closely intertwined. Scarcely any of them—perhaps none but the purely military—can be treated apart from the others. Whatever may be the prime interest of the author of any book on the period, he is perforce compelled to treat the whole of the events of the reign. "The conflict of Whig and Tory" is the one heading which will include them all. The Anglican Church was maintaining, in Europe and in England, the position which she had taken up at the Revolution of 1688-9. The war of the Spanish succession might be called, from the English point of view, "the second war of the Protestant Succession." It was

¹ "The Reign of Queen Anne." By Justin McCarthy. 455 + 431 pp (Chatto and Windus.) 24s.

maintained by the Whigs; it was opposed and finally brought to an end by the Tories. At home, the question was also the maintenance of the Revolution settlement; the Tories were always regretting the "unhappy" disturbance of the direct succession, and corresponding, at least, with the "King over the water," till some of them, like Bolingbroke, pursued a purely Jacobite policy. The Whigs, on the contrary, looked for political support to the ultra-Protestants who worshipped under the protection of the Toleration Act, corresponded with the Elector of Hanover, and finally round the deathbed of the Queen checkmated the plans of Bolingbroke and brought in the Protestant King of Great Britain.

The most important events in the diplomatic history of the war are the acceptance by Louis XIV. of Charles II.'s will, his acknowledgment of "James III.," the death of the Emperor Joseph, and the signing of the Treaties of Utrecht. Louis' acceptance of the will brought on France the hostility of the Austrian house, his proclamation of James roused the war fever in England, and the war was more or less popular in England till the accession of the Archduke Charles to the Austrian dominions in 1711 made it, so far as Europe was concerned, absolutely useless. The consequence was that the Spanish dominions were partitioned between the claimants, an arrangement that immediately gave scope to the restless intrigues of Elizabeth Farnese and later led to the War of Jenkins' Ear. But Great Britain acquired possessions in North America and rights of trade in South America that corresponded to her expenditure.

At home, the leading events are the trial of Sacheverell, the ministerial changes of 1710, the passing of the Occasional Conformity Act and the Schism Act, and the crisis of 1714. These are all closely related to one another and to the events of the war. They mark the rise of the Tory party to power, they indicate the religious character of the struggle and the programme of the High Church party, the gradual evolution of practical Jacobitism and its sudden fall. All these events, foreign and domestic, are illustrated, more perhaps in Anne's reign than at any other period of our history except that of Elizabeth, by the current literature. The writings of Defoe, Addison, Swift and others were mainly political, and space alone forbids our further treatment of the matter.

In the light of this estimate of the reign, we note that Mr. McCarthy does not seem to care to be correct in his description of foreign affairs in general, though his treatment of military matters is detailed; he seems to think that "dissenters" were rising in power, if not actually beginning to exist, in Anne's reign, and he treats the Sacheverell sermons and trial as an isolated incident. His chapters on literature are good and readable, but we are simply lost in his estimate of the characters of Anne, Harley and Bolingbroke, partly because of the extraordinary arrangement of the chapters (some of which seem to have been written independently and to be merely incorporated into the

book) and partly because there are several such estimates, specially of Harley. As to Queen Anne, we have failed to discover Mr. McCarthy's opinion of her. Was she a nonentity or not? The constitutional aspect of the history is almost left to take care of itself.

GREEK LITERARY CRITICISM.¹

WE are glad to welcome another of Prof. Roberts's volumes on Greek literary criticism, edited with the same conscientious care and scholarly ability as the two which preceded it, Longinus "On the Sublime," and Dionysius' "Three Literary Letters." Prof. Roberts has in some respects made an advance on the earlier books. The glossary, which includes all words of interest, and in particular all technical terms of rhetoric, is fuller and more complete than in the other two volumes; something is often added to words which have been treated before, and Latin and English equivalents are given. The translation is certainly as good as in the other books, and, we are inclined to think, better, as being more natural and simpler. In the notes are given all important variants of the Paris MS. 1741 (on which the edition is founded), together with a certain number of emendations, and the authorities for any which are adopted in the text; all quotations which can be identified are given in full, and at the end of the book there is a good deal of illustrative matter. Prof. Roberts rightly thinks it unnecessary to record the variants of inferior MSS., which all appear to be derived from the Paris MS., but readings of the earlier editors which are given are often taken from some of these. The introduction comprises a short account of the chief ancient critics and rhetoricians, a summary of the contents of the work, and a discussion of the date and authorship. It is unfortunate that, as in the case of Longinus, his careful examination leads him to reject the Demetrian authorship as impossible, the linguistic indications pointing unmistakably to the century preceding or following the Christian era. But if it is the truth it is better to know it; and we shall thus be prepared to welcome the author without a shock, if evidence shall ever turn up to show who he was.

We have gone through the book very carefully, and, as the criticisms we might offer are all on points of detail, we prefer to state at once that the book is worthy of the University Press, and to pass on to one or two points which specially interest readers of this journal. To begin with, a perusal of the book strengthens our conviction that the art of composition can be taught, and that the elements of it ought to be taught in schools. As

¹ "Demetrius on Style." The Greek text of Demetrius *De Elocutione*, edited after the Paris Manuscript, with Introduction, Translation, Facsimiles, &c., by W. Rhys Roberts, Litt.D., Professor of Greek in the University College of Wales, Bangor. xiii. + 328 pp. (Cambridge University Press.) 9s. net.

we all know, composition is not taught at all in the chief public schools, and we very much doubt whether anything more than pedantic analysis is taught in the ordinary day-school. Yet the structure of the sentence ought to be taught from the very beginning, and the pupil can easily be led to comprehend the structure of the paragraph, and of simple narrative or description. The Americans do a good deal in this way, but they are too fond of technicalities, and we want something a little more practical, such as the "English Composition" in the Self-Educator Series, or Mr. Cope Cornford's "English Composition." When this should be done, we can conceive of nothing more likely to interest a boy than the present book or Longinus, which might be used not as a classical reading-book, but as a text book of style to be illustrated from English authors. Secondly, we feel more convinced than ever that this kind of appreciative analysis is not only the best way to make a reader enjoy good literature, but (except for the rare few) the only way. Such sections as those on the arrangement of words, or on prose rhythm, open the eye to new beauties, and show the aspirant how to set about producing the same effects. The schoolmaster ought to be deeply grateful to Prof. Roberts for his new book. We will add a recommendation that these three volumes should be given as school prizes; they would interest any intelligent boy far more than Motley's "Dutch Republic" or the estimable works of Prescott.

THREE AMERICAN TEXT-BOOKS OF SCIENCE.¹

THE introduction of physics and chemistry into the curricula of primary and secondary schools is of such recent date that the want of unanimity both as to methods and as to the content of a school course of science is by no means surprising. One of the results of this experimental stage is to be seen in the bewildering number of books with which the teacher is confronted month by month, many of them differing little in scope, and all professing to be an improvement on previous publications. And this fecundity is confined to no particular country. French, German and American teachers of science, as well as those in this country, are all adding to the already abundant supply. Fortunately for the conscientious instructor, who wishes his pupils to have the best possible printed guide, the introductory volumes of science published on the

continent are not often translated into English, so that his choice has usually to be made between English and American books. Even when limited to this extent the selection is difficult. It is probably this question of deciding upon the most suitable text-book which has originated the modern idea among the extremists that all books are out of place in the science class-room, and that each pupil should write his own book after a personal experimental acquaintance with the facts of science he discovers. But like the views of most extremists, the no text-book policy is in most cases impracticable. Though it may be desirable when the teacher has both a complete familiarity with his subject and a genius for teaching, for the ordinary pedagogic practitioner it is a counsel of perfection. In most cases there must be a book, and the important question is to secure the best available.

This brings us to the volumes under consideration. Applying the test that all practical teachers adopt, we ask: In what important respects do they differ from the books we have? Do they meet English requirements? Are they a sufficiently great advance on the books in use to justify their adoption? So far as our space will allow, an attempt will be made to answer these questions.

The book of Messrs. Henderson, Woodhull and Van Arsdale is on a plan which is not common in this country. The first four hundred pages constitute a text-book of general physics on orthodox lines, which deals in the familiar way with the properties of matter, mechanics of solids, mechanics of fluids, heat, magnetism and electricity, light and sound. The last hundred pages or so consist of a number of simple experiments to be performed by the pupil and designed to illustrate the text. But it is better for the experimental work to lead up to the generalisation so that the student may learn from the first that the principles of physics are only credible when deduced from experiment. For English requirements the book covers too wide a range and is marked by a want of preciseness in the instructions for practical work. Only the teacher with restricted manipulative dexterity knows how irritating is the omission of some practical direction necessary to ensure success. More than this, it is not, we hope, in accordance with English ideas to set beginners in physics to puzzle over diffusibility, capillarity, and viscosity (to name three only from a list on p. 15), at the outset. The table of Elements with symbols and atomic weights (on pp. 12-24) is quite out of place at the commencement of the study of science.

Professor Young's book belongs to the same series as the one just referred to, and we find the plan of collecting the experiments at the end of the volume is followed. In addition to this it must be remarked that what is generally called chemical theory, including such subjects as the atomic theory, stoichiometry (Eng. chemical arithmetic), Raoult's law, &c., precedes any description of elements and compounds. Believing as we do that the only rational way of teaching chemistry to

¹"Elements of Physics." By C. Hanford Henderson, Ph.D., and John F. Woodhull, Ph.D., Professor of Physical Science, Teachers' College, Columbia University, New York. x.+388 pp. (Hirschfeld.) With which is bound up: "Physical Experiments: a Laboratory Manual." By Prof. J. F. Woodhull and M. B. Van Arsdale. v.+112 pp. (Hirschfeld.) "The Elementary Principles of Chemistry." By A. V. E. Young, Professor of Chemistry in North-western University. xiv.+252 pp. Part II. "Experimental Illustrations." 106 pp. (Hirschfeld.) "Physics." By Frederick Slate, Professor of Physics in the University of California. xxi.+414 pp. (New York: Macmillan Company.) 6s.

young people is to begin with the examination of simple familiar phenomena, *e.g.*, the rusting of iron, burning, and such changes, we think Professor Young's book will not be of direct service to teachers in English schools.

Professor Slate intends his book for students of from sixteen to eighteen years of age, and clearly points out that it is not intended to guide experimental work, nor to furnish practical hints and directions for use in the class-room laboratory. The volume, however, finishes with an outline course of experiments, with references to Chute's "Practical Physics." Though Professor Slate insists on the value of experimental work and explains at great length in a preface of sixteen pages the place his book is intended to occupy, we are afraid English teachers will be unable to make much use of it, since the conditions here seem to be very different from those in California.

It need scarcely be said that each of the books has points of interest to teachers and students of physics and chemistry, and the fact that they are not exactly adapted to our methods and limitations of instruction does not imply that teachers cannot study them with profit. It is always helpful to become acquainted with new ways of regarding familiar problems.

A NEW GERMAN DICTIONARY.¹

THE work before us is a complete recast of Grieb's well-known dictionary. It has been thoroughly overhauled by Prof. Schröder, of Cologne, who has brought to his task very special qualifications as an English scholar and teacher. The learned editor has made every effort to produce a comprehensive and standard dictionary. The plan, though not differing materially from that of other well-known works on similar lines, has one or two special features which appeal to scholars. In the first place, in both the German and English parts, succinct etymologies of the words treated are given, and as first-hand authorities have always been consulted, the result is excellent. Secondly, the pronunciation of the English words in the English-German part is given in phonetic transcription—a great advance, and one which we think will largely aid the circulation of the work on the continent. We must, however, express our disappointment that this desirable improvement has not been carried out in the German-English part, and cannot altogether admit that Prof. Schröder makes out a good case for this omission in his introduction. True, there are many discrepancies in the pronunciation of German, but it would not have been difficult to have adopted a system by which the stage pronunciation should have been reproduced, and

English students would, we feel sure, have found in this a distinct gain. Let us hope that a future edition will repair this omission.

A good working dictionary should, we take it, contain all the words which the student is likely to meet with in his reading in the ordinary paths of literature; it should further contain words which are in the main colloquial and technical, words which do not lie exclusively in the province of the specialist. We have submitted the volumes before us to a test along these lines. Among other passages, taking one from Freytag, we find in one page two words which we seek in vain: *langlodige* Schafe seine Wohnsitze auf den *Warfen*. We submit that *langlodig* might well find a place; at the same time we fail to find the word in *Flügel* or in *Heyne*, though other words of a rare description are included. It would be interesting to know in this connexion on what method the original compilation of the dictionary was carried out.

The colloquial expressions seem to have been very fully treated. One error seems to have passed uncorrected in the proof reading: *schalten und walten*, to rule the *roast*.

Scientific terms seem to have been accepted in considerable numbers; on the other hand, words connected with sport are but poorly represented; hardly a bicycle term is included; we seek in vain, rim-brake, free wheel, back pedal, or their German equivalents. Mountaineering terms are also far to seek: *bewirtschaften*, *aper*, *Kamin*, *Bergschrund*. On the other hand, nautical terms are included in great variety. We should be inclined to suggest as an improvement the making good of deficiencies of this type and the exclusion of various excrescences in both languages, such as *Tukan*, *Incommensurabilität*, *Kumpe*, in German; *obi*, *proceleumatic*, *riggite* in English.

The labour of dictionary compiling is an arduous and to a certain extent a thankless task. To hold an impartial court upon the various types of words which clamour for admission must tax very heavily the ingenuity and the patience of the lexicographer, and we would not have it thought that we wish by these few criticisms to belittle the work before us. Take it for all in all, the work may be commended to scholars and to learners. It is a good sound working tool, which, in our opinion, will seldom leave a friend in the lurch.

One more grumble. When will German publishers learn that the proper binding for a book of reference is stout leather for the back and corners, and stout *cloth*, not thin paper, for the sides?

Rivingtons' Modern French Series (Beginners' Texts). (1) *Premières Lectures Françaises*; (2) *Recueil de Pièces Faciles*. Prepared and adapted by R. J. Morich. 44 + xii. pp. each. (Rivingtons). 7d. each.—These books call for little comment: in each case there are about twenty pages of anecdotes, &c., in clear type; then some pages of notes and a vocabulary (practically complete). There is the same appendix to both books, containing a list of the commonest irregular verbs, and some notes on the personal, reflexive and relative pronouns. The books are carefully printed, and badly bound.

¹"Grieb-Schröder," "Dictionary of the English and German Languages." 2,600 pp. (London: Henry Frowde. Stuttgart: Paul Neff Verlag.) 2 vols. £1 5s.

NATURE NOTES FOR DECEMBER.

By the REV. CANON STEWARD, M.A.(Oxon.)
Principal of Salisbury Training College.

Animal Life.—The winter is an excellent season for observing more closely the wild animals and the different kinds of birds. Cold and hunger make them approach nearer to man and his habitations; the trail of the otter, hare, rabbit, weasel, stoat, and rats may be identified in the snow; and the leaflessness of the trees enables us to distinguish the birds more clearly. Migrants from the North arrive in hard weather, such as the Snow Bunting, various Ducks, the Pintail, Teal, Widgeons, the Divers, Whitefronted Goose, Brent Goose, Whooper or Wild Swan, Terns, Puffins, Petrels, Curlew, Merganser, Razor-bill, Grebes, Bittern, and the Sea Eagle. All who live near inlets of the sea, the estuaries and the lower reaches of rivers, inland lakes and "broads," should keep their eyes open. Frequent visits should be made to the poultry and game shops to identify the birds exposed for sale, and perhaps the local bird-stuffer may show the visitor the rarer specimens sent to him for preservation. Herons and Kingfishers may now be seen easily along the streams. A walk through the woodlands may be rewarded by the sight of flocks of Wood Pigeons feeding on acorns and beech nuts, the notes of the happy Chaffinches, a cluster of Bramble-finches, and many a Missel-thrush, Fieldfare, and Blackbird despoiling the mountain-ash of its bright berries or the yew tree of its glutinous fruit. The Bullfinches may be espied feeding on the privet berries, and a visit to a sheltered patch of thistles may be rewarded by seeing a flock of beautiful Goldfinches clinging to the downy heads and picking out the seeds. The Green Woodpecker is plainly visible with his red poll and undulating flight and hoarse laugh, either as he taps the hollow trees or rifles the ant hills of their eggs. It is a good time to distinguish the different species of birds, as the Carrion Crow and the Hooded Crow from the Rook. If a bone be hung on a branch the Blue Tit, Marsh Tit, Great Tit, and Cole Tit will come in from the woods near and form an interesting study. The bits of fat will help them to withstand the cold and make their plumage exceptionally glossy. After a heavy snowstorm flocks of Yellow Buntings will visit the farmyards, and often a Sparrow Hawk may be noticed hunting for mice round the ricks.

Plant Life.—The Irish Ivy, Mezereon, Anemone Coronaria, Wallflower, Jasmine, Hepatica, Christmas Rose, Gorse, and Cyclamen may be found in flower; and in fruit are the Privet, Bryony, Buckthorn, Mountain Ash, Holly, Yew, Ivy, and Mistletoe. Leisure may perhaps be found for a study of the various Lichens, of which there are more than a thousand kinds in Great Britain.

The Seashore after stormy weather is prolific in objects of interest, especially at high-water mark as the tide is receding. On some coasts after a strong scour by the sea the sand is washed away and the strata beneath are revealed with treasures for the geologist, especially if a bit of "drift" be exposed or a submerged forest.

General Hints.—The winter naturally affords much opportunity for indoor work, for study with the microscope, visits to the local museum, for rearranging the accumulations of the past summer, mounting and naming specimens, and knowing all there is to be learned about each object, its real character and the part that each played in the realm of nature. It is also a time for reading, and that not merely of books directly dealing with Natural History, but biographies and travels of great naturalists, and also poems, whether in prose or verse, Hugh Macmillan's "Nature Sermons," Emerson's and other Essays,

Thomson's "Seasons" and such poems as Southey's "Holly Tree," Lowell's "The First Snowfall" and the "Dandelion," and Cowper's "Winter," and, of course, the nature poems found in Keats and Wordsworth.

GEOMETRY AT THE CAMBRIDGE LOCAL EXAMINATIONS OF 1903.

THE Local Examinations Syndicate of the University of Cambridge have recently adopted many of the recommendations of the Committees on the Teaching of Mathematics appointed by the British Association and the Mathematical Association, and have issued new schedules for Geometry in the examinations for Preliminary and Junior candidates in December, 1903.

No schedule for Geometry in the examination for Senior candidates is at present issued; but it will be stated in the Regulations that any proof or proposition will be accepted which appears to the examiners to form part of a logical order of treatment of the subject, and that the use of hypothetical constructions is permitted.

The Syndicate have also decided upon various changes in detail in the Regulations for arithmetic, algebra, and trigonometry. These changes will be announced when the full Regulations for December, 1903, are published.

Changes such as these which have now been made by the school-examining authorities in connection with the Universities of Oxford, Cambridge, and London, will have so important an influence on the mathematical teaching throughout the country that we have arranged, to meet the convenience of teachers, for an article at an early date describing the present position of the reform movement in the teaching of mathematics.

The new schedules in Geometry for the Cambridge Local Examinations are as follows:—

Geometry.¹ (Preliminary.)

The paper will consist of two parts, each containing questions on Practical and on Theoretical Geometry. Candidates can pass in Geometry by doing sufficiently well in Part I.; they will be expected to take questions both in Practical and in Theoretical Geometry.

Every candidate must be provided with a ruler graduated in inches and tenths of an inch, and in centimetres and millimetres, a small set square, a protractor, compasses furnished with a hard pencil point, and a hard pencil.

Questions may be set in which the use of the set square or of the protractor is forbidden.

Figures should be drawn accurately with a hard pencil.

Any proof of a proposition will be accepted which appears to the examiners to form part of a logical order of treatment of the subject. In the proof of theorems and deductions from them, the use of hypothetical construction is permitted.

PART I. Practical Geometry.—The following constructions and easy extensions of them: Bisection of angles and of straight lines. Construction of perpendiculars to straight lines. Simple cases of the construction from sufficient data of triangles and of quadrilaterals. Construction of parallels to a given straight line. Construction of angles equal to a given angle. Division of straight lines into a given number of equal parts.

Candidates will be expected to be acquainted with the forms

¹ Valuable suggestions for teachers will be found in a Report on the Teaching of Elementary Mathematics issued by the Mathematical Association (George Bell and Sons, London, price 6d.) For the Practical Geometry teachers are recommended to make use of some work on Geometrical Drawing.

of the cube, the rectangular block, the sphere, the cylinder, and the cone.

Theoretical Geometry.—The substance of the theorems contained in Euclid, Book I., propositions 4-6, 8, 13-16, 18, 19, 26-30, 32-41, 43. Questions upon these theorems, easy deductions from them, and arithmetical illustrations will be included.

PART II. Practical Geometry.—The following constructions and easy extensions of them: Construction of a triangle equal in area to a given polygon. Construction of tangents to a circle. Constructions of common tangents to two circles. Construction of circumscribed, inscribed, and escribed circles of a triangle.

Theoretical Geometry.—The substance of the theorems contained in Euclid, Book I., propositions 47, 48; and Book III., propositions 3, 14-16, 18-22, 31. Questions upon these theorems, easy deductions from them, and arithmetical illustrations will be included.

Geometry.¹ (Juniors.)

The General Instructions given above for Preliminary Candidates also apply to Juniors.

PART I. Practical Geometry.—The following constructions and easy extensions of them: Bisection of angles and of straight lines. Construction of perpendiculars to straight lines. Simple cases of the construction from sufficient data of triangles and of quadrilaterals. Construction of parallels to a given straight line. Construction of angles equal to a given angle. Division of straight lines into a given number of equal parts. Construction of a triangle equal in area to a given polygon. Construction of tangents to a circle. Construction of common tangents to two circles. Construction of circumscribed, inscribed, and escribed circles of a triangle.

Candidates will be expected to be acquainted with the forms of the simpler solid bodies, namely, the cube, the rectangular block, the tetrahedron, the sphere, the cylinder, the wedge, the pyramid, and the cone.

Theoretical Geometry.—The substance of the theorems contained in Euclid, Book I., propositions 4-6, 8, 13-16, 18, 19, 26-30, 32-41, 43, 47, 48; and Book III., propositions 3, 14-16, 18-22, 31. Questions upon these theorems, easy deductions from them, and arithmetical illustrations will be included.

PART II. Practical Geometry.—The following constructions and easy extensions of them: Construction of a segment of a circle containing an angle of given magnitude. Division of straight lines into parts in any given proportion. Constructions of a fourth proportional to three given straight lines, and of a mean proportional to two given straight lines. Division of a straight line in extreme and mean ratio. Division of a straight line internally or externally into segments so that the rectangle under the parts is equal to a given square. Construction of regular polygons in and about circles. Construction of a circle from sufficient data of the following character: (1) radius given, (2) point on the circle given, (3) contact with a given straight line or circle, (4) contact with a given straight line at a given point. Construction of a rectilinear figure to a specified scale or of specified area, and similar to a given figure. Construction of a square equal in area to a given polygon. [In cases where the validity of a construction is not obvious, candidates may be required to indicate the reasoning by which it is justified.]

Illustration and explanation by means of rectangular figures of the following identities:—

$$k(a+b+c+\dots) = ka+kb+kc+\dots,$$

$$(a+b)^2 = a^2+2ab+b^2,$$

$$(a-b)^2 = a^2-2ab+b^2,$$

$$a^2-b^2 = (a+b)(a-b).$$

¹ See the preceding note.

Theoretical Geometry.—The substance of the theorems contained in Euclid, Book III., propositions 32, 35-37; Book VI., propositions 1-8, 19, 20, 33, together with propositions A and D. Questions upon these theorems, easy deductions from them, and arithmetical illustrations will be included.

In dealing with proportion it may be assumed that all magnitudes of the same kind can be treated as commensurable.

Specimen papers in Geometry (Preliminary and Junior), of the same general character as those that will be set in December, 1903, will be issued with the Book of Examination-papers for December, 1902.

THE CLASS-TEACHING OF ENGLISH POETRY.¹

By S. E. WINBOLT, M.A.
Christ's Hospital.

God's prophets of the beautiful
They were, those poets.

At my school a shortish holiday has succeeded a short but most momentous term, in which the biggest educational transplantation on record—almost Oriental in scale—has necessitated the arranging of a vast amount of detail. Most probably the ideal for an assistant-master in these circumstances would be to emulate Charles Lamb and spend his leisure time:—

Sometimes outstrect in perfect idleness,
Nought doing, nothing saying, thinking less.

At any rate, I have not found the hours to put Herbartian system into the few things I have to say on the teaching of English poetry. I should have liked to jot down a few ideas on the minimum of grammar, on the utilitarian side of English instruction as exemplified in correction of syntactical mistakes, punctuation, and synthesis, on the *viva-voce* method as the most effective in teaching analysis and some parts of composition, and especially on the graduated teaching of English essay-writing. On this last topic books are hopelessly diffuse. I believe the real essentials in the earlier stages admit of being written down on two pages of a note book, and that these points should be hammered away at for the first two years, when the reproduction of narratives is done with, and until the study and learning by heart of pages of Macaulay put a finish on the schoolboy's efforts at composition. But I thought it best to turn exclusively to what interested me most, the class-teaching of English poetry. And even in this sphere I must be content to copy the bee which, lighting in yonder patch of clover, flits without indecision from blossom to blossom, electing to extract something from these and pass by those—a most excellent mystery. If in this way I touch a few points that seem important to me, I hope that I may interest some brother teacher, if only by reason of apparent caprice, half as much as my honey-bee has interested me. I shall venture to put before you details of personal experience, though I cannot pretend to be hall-marked with the mark of the—training institutions recognised in Appendix D of the recent Order in Council, and therefore speak with the greatest diffidence. My experience has ranged over about nine years, during which time I have been mainly concerned with two sets on the modern side, a lower fourth of boys averaging 14.6, and an upper fourth, the average age of which was about 15.6, or a little more. Of these two sets the lower was composed of boys of somewhat less than average intelligence, the higher of boys with good brain power. Class-

¹ A paper read to the Assistant-masters' Association, September, 1902.

time allowed was generally in the earlier lessons one and-a-half hours a week, and in the later about one hour.

Choice of Poetry.

First, as to the choice of poetry. The main requisites for both forms were that it should be, first, definite and concrete in conception; and second, rhythmically vigorous in expression. One cannot in these early stages give first consideration to truth, greatness, or originality of conception. I have found good material for the lower division in ballads, such as "Sir Patrick Spence" and "Chevy Chase," simple poems from Wordsworth, e.g., "To the Daisy," "I wandered lonely as a Cloud," or "Lucy Gray," Browning's "Pied Piper," Goldsmith's "Traveler" and "Deserted Village," "Childe Harold" (cantos I. and II.), Gray's "Elegy," "The Bard," and "Ode on Eton," "The Ancient Mariner," Tennyson's "Dora," &c. These boys had been saturated with Scott before they came to me.

For the upper division nearly always plays of Shakespeare, especially the "Merchant of Venice," "Macbeth," "As You Like It," "Twelfth Night," "Tempest," and "Henry V." "Childe Harold," cantos III. and IV., would occasionally give variety. I tried "Samson Agonistes," but made complete shipwreck. Spenser, I should say, would be excellent for boys of this standard; also Milton's three poetic poems. I should be almost inclined to banish Milton's "Paradise Lost" from the school curriculum.

A third requisite for class poetry should be mentioned. One cannot demand of poetry that it should inculcate directly virtue and piety, yet the poetry selected should ring morally sound and exalt unmistakably the highest instincts and feelings of human nature. Gray's poetry is eminently of this kind. I believe it right occasionally even to moralise on such a passage as "Where ignorance is bliss, 'tis folly to be wise," or on such a splendid Virgilian stanza as "The applause of listening senates to command." But you, who know the British schoolboy, understand that the words you say must be obviously felt and sincerely uttered: the treatment must be light. Preaching is fatal.

Besides the form-work chosen for the term, some English poems produced during the history period under study should be read discursively from time to time in an odd ten minutes. A good collection for such a purpose is Messrs. Blackwood's "New School Anthology."

Method in Class.

But "the guests are met, the feast is set." My own method has been first to try to impress upon the class in a few words the importance of cultivating a liking for poetry, the gist being, "I am keen, and want you to be." Then we have taken our texts, and leaving aside for the time being all notes about the poem and its author, read it through in its entirety. Next, enough interest being aroused, we have read any introduction given. Such should be very brief and pointed, a half-dozen pages being the extreme limit. It should treat of the author's life, his work, the circumstances of composition and the form of the particular poem. We next read over some thirty lines of the text and elicited as much as we could of poetical and literary interest. Is it presumptuous for me to claim that our method was "heuristic," always remembering that *Ars longa, vita brevis*? This lesson is best done by the master without specific preparation, or even the advantage of the proverbial one-hour start of his pupils. What points were elicited? The first ten lines necessarily entail a treatment of metre in its broadest points, the principles of "variety in uniformity" and "descriptive rhythms" being specially emphasised. This will be enough for your boys to ruminate upon for a week. Next lesson you require the points of last week's talk, and proceed to strain the

next thirty lines. Up crops a good alliteration. It is worth while to explain briefly the history of alliteration, its use and abuse, the various subtle effects produced by it with reference perhaps to the letters *s* and *l*, as in "the lustre of the long convolvulus," or "the lowing herd winds slowly o'er the lea." You will illustrate these points profusely, but put three or four lines on the blackboard to be garnered in the memory.

I am glad when we come upon the first obvious case of metaphor in the text, some such line as "When smiling spring its earliest visit paid." Our course is clear for *that* lesson at least. Why does the poet not state directly what he wishes to say? Because he is *imaginative*, and sees one thing in relation to another; because he wants to explain the unfamiliar by the familiar; because he wants to be terse as well as suggestive. And so you drag out to the light the full connotation of the word or phrase, and ultimately resolve the metaphor into four terms, on the board, the first two expressing the more familiar, the second the less familiar side of the idea presented. Recurring to this subject next week, while the thirty lines are being read you put a price on every metaphor captured, and the duller boy is keen to make a bag. They proceed to offer their contributions. After rejecting a simile or two, you find that so various are their oblations that the different degrees of metaphor must be tackled on the spot, and it must be pointed out that very many metaphorical words have passed into such common use that their poetical nature easily escapes notice. From the collection choose two sound examples and ask the class to put down on paper the four implied terms. One or two only, out of twenty-five, succeed in the first attempt; still, good progress has really been made in the apprehension of the relation of thought to poetical expression. Now drop the subject for a time and let it soak in. In a later lesson beat up another brace of metaphors and set them for expansion. Possibly, towards the end of term, some eight or a dozen will be able to do the thing correctly. And so we go on elucidating points as they arise: here a personification, especially if you happen to be reading the two stanzas in Gray's "Ode," "These shall the fury passions tear"; there a transference of adjective (insinuating cautiously and apologetically the news that it is sometimes called *hypallage*); here an eloquent prolepsis or a noble exaggeration, there an inversion of order or an epigram. What more pleasant than to search together for the force that lurks in such abstractions as:—

The rattling terrors of the vengeful snake;

or for the full meaning of the host, who is

Careful to see the mantling bliss go round?

Or, again, you ask, "Does Gray write the words of the line,

Their homely joys and destiny obscure,

in that order simply to secure a rhyme?" and propound by the way the problem, "Does rhyme thwart or help the poet?" A class can feel, if it cannot analyse, the peculiar pungency of an oxymoron, as in Spenser's "The foul well-favoured witch," or Gray's "This pleasing anxious being e'er resigned." But be careful how you scare pallid pupils with the thunders of oxymoron, metonymy, anacolouthon, aposiopesis, onomato-poetic. But words may have as much charm as figures of speech, and many words (how many one is apt to under-estimate) are Hebrew to young boys. The genteel word with a long literary pedigree may ask for a word of praise. Archaic words are sometimes only to be explained: but sometimes, especially where they have degenerated or improved their position, they are to be traced to their forbears in order that curiosity may be whetted. In all doubtful cases, e.g. (at random), "transport," "wanton," "obsequies," "haggard," and so on, the meaning must be fixed and crystallised. For a change, adjectives may be shown by careful contrast with synonyms to be appro-

appropriate, and with reference to the context not superfluous. Grammar occasionally asks for admittance, if haply an inversion poetic has introduced the slightest difficulty: and paraphrase has been used here and there partly to show how inadequate other words are, and that the poet has used the right word in the right place.

About the fifth or sixth lesson the class is prepared to bring in the first twenty or twenty-five lines as repetition, and if on examination the notes at the end of the book are reasonable, you insist that they should be intelligently read and brought in with the "rep." These may corroborate or add to the aesthetic points you have discussed, and provide, probably too generously, detailed information, historical and literary, such as you could not give off-hand. "Rep.," word-perfect and unbungling "rep.," you exact with Draconian austerity. About one in a hundred boys can't learn English "rep." My experience is that your shuffler soon avoids pretexts as a mole or a beetle the light. And this first "rep." lesson—what a tough task! In it you must instil once and for all the ideas (you will not get more than that for some lessons) that in recitation the head must be slightly raised, the syllables all enunciated clearly and yet in due proportion of emphasis, that sense pauses mostly have more weight than rhymes or unpunctuated ends of lines, and that the proper voice inflexion does not always come spontaneously, but sometimes needs thought. Only about forty per cent. of boys seem to have a natural ear for the suitable risings and fallings of the voice. Of the other sixty some ten perhaps can be taught to observe and improve themselves in this respect. It will take two or three terms to break boys of the tendency (born of a British shyness which, as you will at once show them, is unreasonable)—the tendency to gabble through their lines on the principle of *troppo accelerando*.

Printed Notes.

As to printed notes, I have occasionally issued a dispensation with regard to them, so utterly adverse were they to the growth of literary taste. The man who arranges an apparatus for parsing and analysing Gray's "Elegy" should be taken out and —, well, struck off the Teachers' Register.

We recommend that parsing and analysis exercises be taken at random from *The Daily Mail*; these have the added attraction that they sometimes lead to an analytical *non possumus*. Notes should be few, and almost all of a literary stamp. They should be directed to helping the young mind to grasp the thought of the passage, to realise how deeply the poet has felt in this line, or how in that the expression fits the feeling like a glove. Here and there it should be pointed out that the sunlight of imagination has played on the theme, or the moonbeams of fancy slumbered there: attention should be drawn to the progress of the action, deeds or words illustrating character noted, and continuity or levelness of treatment, when you have it, exhibited, and adduced as a proof that the poet, when he wrote, was really possessed, perhaps through the medium of reminiscence, by his subject. Certainly, notes should demonstrate a point easily perceived by boys, the appropriateness of grandiose or simple expression, distinguishing between the simplicity which comes from poverty of thought (as often in Mrs. Hemans) and the simplicity of restraint (as in Tennyson) which implies the power of writing with exuberance. Is it not sheer fatuity to suppose that interesting and stimulating notes on English poetry cannot be written apart from philological diatribes, and irrelevant and excessive historical, mythological, and biographical dates and details?

It has been my practice to have learnt some 200-300 continuous lines of poetry in each term. At the end of revision (and I believe entirely in the driving home of points taught, as much with Tennyson as with Thucydides) this amount has

been brought up as one lesson; but at the beginning of revision I have dictated brief notes on salient points discussed, at the rate of about one note to ten lines. Occasionally, for variety, I make an excursion beyond the term's portion, and pick out beautiful passages to be read without comment; or perhaps, in passing, try to analyse the grandeur of some such verse as Milton's "Sonorous metal blowing martial sound," or Gray's "Sublime their starry fronts they rear," and "Struck the deep sorrows of his lyre," or Byron's "Dark Guadiana rolls his power along," and "See how the mighty shrink into a song."

Most boys will carry away one or two of these, and use them, unconsciously perhaps, as touchstones for detecting the false coin of weak writing and the fustian of Addisonian commonplace. Possibly they will have deduced for themselves the maxim of criticism, "Whatever is translatable in other and simpler words of the same language, without loss of sense or dignity, is bad."

Results.

What success has followed with boys not yet fifteen? I can only say that, though many winged words have probably passed over their heads, the boys have seemed interested, and usually done creditable examinations, showing enough independence in their answers to prove that the plan of giving a few notes had not led to mere cram, but had only supplied a definite ground to build on. Of course, literature examinations are too often inadequate. The College of Preceptors' papers strike me as being on somewhat formal lines (no doubt easier, therefore, to mark), and evincing little of the spirit of literature. Perhaps the best of this sort of questions are those which ask the examinee to cap certain quotations, or to explain words supplying context and comment. It is good, I think, to ask, "What two passages of about four lines do you particularly like? Give all your reasons." Or, "Give two examples from your poem of metaphor, personification, or other figure of speech." Or, "Quote passages which illustrate the poet's feelings of indignation, pity, joy, &c." You will get answers to these questions, and they are not difficult to mark. But, examinations aside, I am convinced that a poem like Goldsmith's "Traveller," thoroughly worked out and learnt by heart, leaves in the young mind poetical principles and rhythms never to be forgotten, and that in the three impressionable years from fourteen to seventeen a boy who travels on these lines lays in for life goodly store of humanity. In a few cases they have been encouraged to read poetry for themselves, at first, perhaps, as a sort of achievement, like Leigh Hunt driving on through the verses of Butler's "Hudibras" "without understanding a twentieth part of them, but now and then laughing immoderately at the rhymes and similes, and catching a bit of knowledge unawares." Much they have wittingly absorbed of the noble style, and more unwittingly. And certainly, if the teacher has been in earnest, he has driven home the truth, which somehow never becomes a truism, that man does not live by bread alone, or by bread-winning knowledge.

God's prophets of the beautiful
They were, those poets.

Shakespeare.

With the *upper* division the same principles were applied, but Shakespeare was nearly always the pabulum. The figures of speech could be treated lightly, and the considerable demands made by Shakespearian grammar and language satisfied. We were able to admire the imagination of the great maker, to analyse what contributions were made to the general impression by feeling and thought, or their lesser sisters, fancy and wit. We did not hesitate to call attention to Shakespeare's lavish amplitude of exuberant thought, and point out that by unduly stimulating the reader's mental activity, Shakespeare is apt

to jeopardise the main theme, much as Wagner does with his orchestrations. Deepest grief and highest joy are wont to speak with difficulty, if, indeed, they can find voice at all. Provided that excess is avoided, one may deal fully with Shakespearian grammar and language. We all realise, do we not? how large are the traditional elements of association and reminiscence in any national poetry. And for this reason a boy's training in English poetry should, to some extent, follow the course of history. Begin with ballads. Possibly a young boy's first introduction to poetry should be through quite modern verse, "Drake's Drum" and the like. But after a good start is made, hark back. At any rate, reserve the generality of modern poetry, such as that of Tennyson, mainly for upper forms, in which some idea may have been acquired of what the past has done to build up the structure of to-day. The difficulties of Shakespeare whet the intelligence of brighter boys. Such a speech as Macbeth's, "If it were done when 'tis done," and many similar entanglements, will readily occur to most of us. Stiffness is the one thing needful to check a boy's tendency to think lightly of an English lesson. One is reminded of Coleridge's words about Bowyer's Shakespeare and Milton lessons: "And they were the lessons, too, which required most time and trouble to bring up so as to escape his censure."

Stimulus for the Teacher.

So much for the taught. A word or two of the teacher and his equipment. Let me, with deference, urge that, as in all teaching so in this, success depends upon the enthusiasm of the teacher. It is foolish, as Mr. Benson says, for a master to plan out his life as though it ended at thirty. Athletic must be balanced by intellectual interests. But our profession makes such great demands on us that, though in order to keep our minds keen we ought, like the bull that sharpens his horns on a tough oak, deliberately to tilt against intellectual obstacles, we often have to content ourselves with less heroic measures. Now, the study of English poetry, with the gradual sapping and assimilating of it, is one peculiarly fitted to the conditions of the teacher's life. At any one time, it need not make excessive demands on tired faculties. Rather, there are so many and so diverse elements that go to the making of good poetry that we can always get from it something to suit our state of mind. Educating, soothing, humanising, poetry is calculated to purify by purgation the mind, the feelings, the heart.

I will end by indicating a few of the books I have in my own case found helpful towards "the benefit of clearly feeling and of deeply enjoying the really excellent, the truly classic in poetry." I am a firm believer in Ward's "English Poets." A few of the introductory essays there printed, taken together, are in themselves a school of poetical criticism. Let me instance the general introduction, and essays on Gray and Keats by Matthew Arnold, the essays on Chaucer and Cowper by Humphrey Ward, on Milton and Pope by Mark Pattison, Dryden by H. W. Ward, James Thomson by George Saintsbury, Goldsmith by Edward Dowden, Burns by John Service, Wordsworth by R. W. Church, Coleridge by Walter Pater, Byron by J. A. Symonds, and Shelley by F. W. Myers. A course of this kind of reading will create a sound judgment, and enable the teacher to enjoy with the enjoyment which is contagious. Among others the following are real eye-openers: Hazlitt's "Lectures on the English Poets," Burke's "Essay on the Sublime and Beautiful," Coleridge's "Biographia Literaria," Leigh Hunt's "Imagination and Fancy," Longinus on "The Sublime," and Prof. Butcher's "Aristotle's Theory of Poetry and Fine Art."

Summary.

Briefly to summarise the points I have tried to make. The requisites for boys' poetry are concreteness of conception,

vigour of expression, and high moral tone. See first the poem itself as a whole, not facts *about* it. Master and boys should co-operate in discovering the poetry. Figures of speech, especially metaphors, are of prime importance. In explaining, terms used should be simple, at any rate at first. The meanings of words must be fixed. Grammar to be admitted only to elucidate the poetry. Insist on repetition, which must be properly recited. The need, scarcity, and essence of literary notes. Passages should be read without comment, or in relation to the history period. Results are not necessarily apparent in examinations. Shakespeare is *the* pabulum for bright boys. Poetry the teacher's study *par excellence*. Suggestions for stimulating reading.

THE COMMITTEE STAGE OF THE EDUCATION BILL.

THE first seven clauses of the Education Bill, in its amended form, were printed in our issues for August and September (pp. 307 and 347). As was pointed out last month (p. 431), on its re-assembly the attention of the House of Commons was at once devoted to Clause 8. Since then, considerable progress has been made. For the purposes of reference we print the remaining Clauses of the Bill, both in their original and amended forms.

CLAUSE 8.—MAINTENANCE OF SCHOOLS.

Original Form.

(1) The local education authority shall maintain and keep efficient all public elementary schools within their area which are necessary, subject, in the case of a school not provided by them, to the following conditions:

(a) The managers of the schools shall carry out any directions of the local education authority as to the secular instruction to be given in the school.

(b) The local education authority shall have power to inspect the school, and the accounts of the managers shall be subject to audit by that authority.

(c) The consent of the local education authority shall be required to the appointment of teachers, but that consent shall not be withheld except on educational grounds.

(d) The managers of the school shall, out of funds provided by them, keep the schoolhouse in good repair, and make such alterations and improvements in the building as may be reasonably required by the local education authority.

(e) The local education authority shall have the right of appointing such persons as they think fit to be additional managers so that the number of the persons so appointed, if more than one, does not exceed one-third of the whole number of managers.

(2) If any question arises under this section between the local education authority and the managers of a school, that question shall be determined by the Board of Education, and compliance with this section shall be one of the conditions required to be fulfilled by an elementary school in order to obtain a parliamentary grant.

(3) The grant under the Voluntary Schools Act, 1897, in respect of any schools maintained by a local education authority, shall, instead of being distributed by the Board of Education, be paid by that Board to that authority, and shall be applied by the authority in aid of the expenses incurred by them under this Part of this Act.

As Amended.

(1) The local education authority shall maintain and keep efficient all public elementary schools within their area

which are necessary, and have the control of all expenditure required for that purpose, other than expenditure for which, under this Act, provision is to be made by the managers, so long as, in the case of a school not provided by them, the following conditions and provisions are complied with :

(a) The managers of the school shall carry out any directions of the local education authority as to the secular instruction to be given in the school, including any directions with respect to the number and educational qualifications of the teachers to be employed for such instruction, and with respect to the dismissal of any teacher on educational grounds, and if the managers fail to carry out such directions the local education authority shall, in addition to their other powers, have the power themselves to carry out the direction in question as if they were the managers.

(b) The local education authority shall have power to inspect the school.

(c) The consent of the local education authority shall be required to the appointment of teachers, but that consent shall not be withheld except on educational grounds, and the consent of the authority shall also be required to the dismissal of a teacher unless the dismissal be on the grounds connected with the giving of religious instruction in the school. Provided that assistant-teachers and pupil teachers may be appointed, if it is thought fit, without reference to religious creed or denomination.

(d) The managers of the school shall provide the school house free of any charge, except for the teachers' dwelling-house, if any, to the local education authority for use as a public elementary school, and also for other educational purposes if the local education authority have no other suitable accommodation in schools provided by them, but not more often than three days in the week, and shall, out of funds provided by them, keep the school house in good repair, and make such alterations and improvements in the building as may be reasonably required by the local education authority.

(e) The managers of a school not provided by the local education authority, in respect of the use by them of the school furniture out of school hours, and the local education authority in respect of the use by them of any room in the school out of school hours, shall be liable to make good any damage caused to the furniture or the room, as the case may be, by reason of that use (other than damage arising from fair wear and tear) and the managers shall take care that after the use of a room in the school by them the room is left in a proper condition for school purposes.

(2) If any question arises under this section between the local education authority and the managers of a school, that question shall be determined by the Board of Education, and compliance with this section shall be one of the conditions required to be fulfilled by an elementary school in order to obtain a parliamentary grant.

(3) In any case in which there are more candidates for the post of pupil teacher than there are places to be filled, the appointment shall be made by the local education authority, and they shall determine the respective qualifications of the candidates by examination or otherwise.

(4) Religious instruction shall be given in a public elementary school not provided by the local education authority in accordance with the tenor of the provisions (if any) of the trust deed relating thereto, and shall be under the control of the managers.

CLAUSE 9.—PROVISION OF NEW SCHOOLS.

(Passed without Amendment.)

Where the local education authority or any other persons propose to provide a new public elementary school, they shall give public notice of their intention to do so, and the managers of any existing school and the local education authority (where

they are not themselves the persons proposing to provide the school), and any ten ratepayers in the area for which it is proposed to provide the school, may, within three months after the notice is given, appeal to the Board of Education on the grounds that the proposed school is not required, or that a school provided by the local education authority, or not so provided, as the case may be, is better suited to meet the wants of the district than the school proposed to be provided, and any school built in contravention of the decision of the Board of Education, on such appeal, shall be treated as unnecessary.

CLAUSE 10.—NECESSITY OF SCHOOLS.

Original Form.

The Board of Education shall determine in case of dispute whether a school is necessary or not, and in so determining and also deciding on any appeal as to the provision of a new school, shall have regard to the interest of secular instruction, to the wishes of parents as to the education of their children, and to the economy of the rates; but a school actually in existence shall not be considered unnecessary in which the number of scholars in average attendance as computed by the Board of Education is not less than thirty.

As Amended.

The Board of Education shall, without unnecessary delay, determine in case of dispute whether a school is necessary or not, and in so determining, and also in deciding on any appeal as to the provision of a new school, shall have regard to the interest of secular instruction, to the wishes of parents as to the education of their children, and to the economy of the rates; but a school already recognised as a public elementary school shall not be considered unnecessary in which the number of scholars in average attendance as computed by the Board of Education is not less than thirty.

CLAUSE 11.—POWER TO ENFORCE DUTIES UNDER ELEMENTARY EDUCATION ACTS.

Original Form.

If the local education authority fail to fulfil any of their duties under the Elementary Education Acts, 1870 to 1900, or this Act, in any part of their area, the Board of Education may, after holding a public inquiry, make such order as they think necessary or proper for the purpose of compelling the authority to fulfil their duty, and any such order may be enforced by mandamus.

As Amended.

If the local education authority fail to fulfil any of their duties under the Elementary Education Acts, 1870 to 1900, or this Act, or fail to provide such additional public accommodation as is, in the opinion of the Board of Education, necessary in any part of their area, the Board of Education may, after holding a public inquiry, make such order as they think necessary or proper for the purpose of compelling the authority to fulfil their duty, and any such order may be enforced by mandamus.

Part IV.—General.

CLAUSE 12.—EDUCATION COMMITTEES.

Original Form.

(1) Any council in the exercise of powers under this Act shall, except as respects the raising of a rate or borrowing money for the purposes of this Act, or the adoption by them of Part III. of this Act, act through an education committee or education committees, constituted in accordance with a scheme made by the council and approved by the Board of Education.

(2) Every such scheme shall provide—

(a) For the selection and appointment by the council of at least a majority of the committee; and

(b) For the appointment by the council, on the nomination where it appears desirable, of other bodies, of persons of experience in education, and of persons acquainted with the needs of the various kinds of schools in the area for which the council acts.

(3) Any such scheme may, for all or any purposes of this Act, provide for the constitution of a separate education committee for an area within a county, or for a joint education committee for any area formed by a combination of counties, boroughs, or urban districts, or of parts thereof. In the case of any such joint committee it shall suffice that a majority of the members are selected and appointed by the councils of any of the counties, boroughs, or districts out of which or parts of which the area is formed.

(4) Before approving a scheme the Board of Education shall take such measures as may appear expedient for the purpose of giving publicity to the provisions of the proposed scheme, and may, if they think fit, hold a public inquiry.

(5) If a scheme under this section has not been made by a council and approved by the Board of Education within twelve months after the passing of this Act, that Board may, subject to the provisions of this Act, make a provisional order for the purposes for which a scheme might have been made.

(6) In Wales and Monmouthshire any county governing body constituted under a scheme made in pursuance of the Welsh Intermediate Education Act, 1889, shall be the education committee, under this Act, of the council of the county or county borough, unless any other scheme is proposed by the council.

As Amended.

(1) Any council having powers under this Act shall establish an education committee or education committees constituted in accordance with a scheme made by the council and approved by the Board of Education.

Provided always that if a council having powers under Part II. only of this Act determine that an education committee is unnecessary in their case, it shall not be obligatory on them to appoint such a committee.

(2) All matters relating to the exercise by the council of their powers under this Act, except the power of raising a rate or borrowing money, shall stand referred to the education committee, and the council, before exercising any such powers, shall, unless in their opinion the matter is urgent, receive and consider the report of the education committee with respect to the matter in question. The council may also delegate to the education committee, with or without any restrictions or conditions as they think fit, any of their powers under this Act, except the power of raising a rate or borrowing money.

(3) Every such scheme shall provide—

(a) For the selection and appointment by the council of at least a majority of the committee, who shall also be members of the council unless the council shall otherwise determine.

(b) *Unaltered.*

(c) For the inclusion of women as well as men among the members of the committee.

(d) That any person shall be disqualified for being a member of an education committee who, by reason of holding an office or place of profit, or having any share or interest in the contract, or employment, is disqualified for being a member of the council appointing the education committee. But no such disqualification shall apply to a person by reason only of his holding office in a school or college aided, provided, or maintained by the council; and

(e) For the appointment, if desirable, of members of school

boards existing at the time of the passing of this Act as members of the first committee.

Sub-sections (3), (4), and (5) remain in their original form but are renumbered (4), (5) and (6).

(7) Any scheme for establishing an education committee of the council of any county or county borough in Wales, or of the county of Monmouth or county borough of Newport, shall provide that the county governing body constituted under the Welsh Intermediate Education Act, 1889, for any such county or county borough shall cease to exist, and shall make such provision as appears necessary or expedient for the transfer of the powers, duties, property, and liabilities of any such body to the local education authority under this Act, and for making the provisions of this section applicable to the exercise by the local education authority of the power, so transferred.

CLAUSE 13.—EXPENSES.

Original Form.

(1) The expenses of a council under this Act shall, so far as not otherwise provided for, be paid, in the case of the council of a county out of the county fund, and in the case of the council of a borough out of the borough fund or rate, and in the case of the council of an urban district as expenses incurred for the general purposes of the Public Health Acts. Provided that—

(a) The county council may if they think fit charge any expenses incurred by them under this Act with respect to education other than elementary on any parish or parishes which in the opinion of the council are served by the school or college in connection with which the expenses have been incurred; and

(b) The county council shall not raise any sum on account of their expenses under Part III. of this Act within any borough or urban district the council of which is the local education authority for the purposes of that Part; and

(c) The county council shall charge any expenses incurred by them in respect of capital expenditure on account of the provision or improvement of any public elementary school on the parish or parishes which in the opinion of the council are served by the school; and

(d) The county council shall raise any expenses incurred to meet the liabilities of any school board transferred to them exclusively within the area which formed the school district in respect of which the liability was incurred.

(2) All receipts in respect of any school maintained by a local education authority, including the annual parliamentary grant, but excluding sums specially applicable for purposes for which provision is to be made by the managers, shall be paid to that authority.

(3) Separate accounts shall be kept by the council of a borough of their receipts and expenditure under this Act, and those accounts shall be made up and audited in like manner and subject to the same provisions as the accounts of a county council, and the enactments relating to the audit of those accounts and to all matters incidental thereto and consequential thereon, including the penal provisions, shall apply.

As Amended.

(1) The expenses of a council under this Act shall, so far as not otherwise provided for, be paid, in the case of the council of a county out of the county fund, and in the case of the council of a borough out of the borough fund or rate, or, if no borough rate is levied, out of a separate rate to be made, assessed, and levied in like manner as the borough rate, and in the case of the council of an urban district other than a borough in manner provided by section thirty-three of the Elementary Education Act, 1876, as respects the expenses mentioned in that section. Provided that—

(a) *Unaltered.*

(b) *Unaltered.*

(c) The county council shall charge such portion as they think fit, not being less than one-half or more than three-fourths of any expenses incurred by them in respect of capital expenditure on account of the provision or improvement of any public elementary school on the parish or parishes which in the opinion of the council are served by the school; and

(d) The county council shall raise such portion as they think fit, not being less than one-half or more than three-fourths of any expenses incurred to meet the liabilities on account of loans of any school board transferred to them exclusively within the area which formed the school district in respect of which the liability was incurred so far as it is between their area.

(2) *Unaltered.*

(3) *Unaltered.*

CLAUSE 14.—BORROWING.

Original Form.

(1) A council may borrow for the purposes of the Elementary Education Acts 1870 to 1900, or this Act, in the case of a county council as for the purposes of the Local Government Act, 1888, and in the case of the council of a county borough, borough, or urban district as for the purposes of the Public Health Acts, but the money borrowed by a borough council shall be borrowed on the security of the borough fund or borough rate.

(2) Subsections (1) and (5) of section eighty-seven of the Local Government Act, 1888, shall apply with respect to the sanction of any loan under this Act.

(3) Money borrowed under this Act shall not be reckoned as part of the total debt of a county for the purposes of section sixty-nine of the Local Government Act, 1888, or as part of the debt of a county borough or urban district for the purpose of the limitation on borrowing under subsections two and three of section two hundred and thirty-four of the Public Health Act, 1875.

As Amended.

(1) Instead of last two lines read "but the money borrowed by a borough or urban district council shall be borrowed on the security of the fund or rate out of which the expenses of the council under this Act are payable.

(2) *Unaltered.*

(3) *Unaltered.*

CLAUSE 15.—ARRANGEMENTS BETWEEN LOCAL EDUCATION AUTHORITIES AND COUNCILS.

Original Form.

A local education authority—

(a) may make arrangements with the council of any county, borough, district, or parish, whether a local education authority or not, for the exercise by the council, on such terms and subject to such conditions as may be agreed on, of any powers of the authority in respect of the control or management of any school or college within the area of the council; and

(b) if the authority is the council of a non-county borough or urban district which has power to adopt or has adopted Part III. of this Act, may, at any time after the passing of this Act, by agreement with the council of the county, and with the approval of the Board of Education, relinquish in favour of the council of the county, their powers and duties under this Act as to elementary education, including the power to adopt Part III. of this Act, and in that case they shall cease to be a local education authority under this Act and to have concurrent powers as to education other than elementary.

As Amended.

An authority having powers under this Act—

(a) *Unaltered.*

(b) if the authority is the council of a non-county borough or urban district, may, at any time after the passing of this Act, by agreement with the council of the county, and with the approval of the Board of Education, relinquish in favour of the council of the county their powers and duties under this Act; and in that case the powers and duties of the authority under this Act shall cease, and the area of the authority, if the powers and duties relinquished include powers as to elementary education, shall as respects those powers and duties be part of the area of the county council.

CLAUSE 16.—PROVISIONAL ORDERS AND SCHEMES.

Original Form.

(1) Sections two hundred and ninety-seven and two hundred and ninety-eight of the Public Health Act, 1875 (which relate to Provisional Orders), shall apply to any provisional order made under this Act as if it were made under that Act, but references to a local authority shall be construed as references to the authority to whom the order relates, and, as respects a Provisional Order constituting an education committee, references to the Local Government Board shall be construed as references to the Board of Education.

(2) Any scheme or provisional order under this Act may contain such incidental or consequential provisions as may appear necessary or expedient.

(3) A scheme under this Act when approved shall have effect as if enacted in this Act, but may be revoked or altered by a scheme made in like manner.

As Amended.

(1) The words "as respects a Provisional Order constituting an education committee" are omitted.

(2) *Unaltered.*

(3) A scheme under this Act when approved shall have effect as if enacted in this Act, and any such scheme or any Provisional Order made for the purposes of such a scheme may be revoked or altered by a scheme made in like manner as a scheme for establishing an education committee under this Act.

CLAUSE 17.—OVERLAPPING SCHOOL-BOARD AREAS.

Original Form.

Where an existing school-board district is situate in the area of more than one local education authority, a resolution of any of those authorities adopting Part III. of this Act shall not come into force until the Board of Education have by order after public enquiry made such arrangements as they think expedient for the performance of the powers and duties of the school board in any part of the district for which Part III. is not adopted, and any such order shall have effect as if enacted in this Act.

As Amended.

Disagreed to.

CLAUSE 18.—DEFINITIONS.

Original Form.

(1) In this Act, and in the Elementary Education Acts, the expression "elementary school" shall not include any school carried on as an evening school under the regulations of the Board of Education.

(2) The power to provide instruction under the Elementary Education Acts, 1870 to 1900, shall, except where those Acts expressly provide to the contrary, be limited to the provision of

instruction given under the regulations of the Board of Education to scholars of not more than fifteen years of age in a public elementary school.

(3) In this Act, unless the context otherwise requires, any expression to which a special meaning is attached in the Elementary Education Acts, 1870 to 1900, shall have the same meaning in this Act.

(4) In this Act, the expressions "powers," "duties," "property," and "liabilities" shall, unless the context otherwise require, have the same meaning as in the Local Government Act, 1888.

(5) The power of a local education authority to supply or aid the supply of education other than elementary shall include power to make provision for the purpose outside their area in cases where they consider it expedient to do so in the interests of their area.

(6) Population for the purposes of this Act shall be calculated according to the census of nineteen hundred and one.

As Amended.

(1) The words "where any part of the education given is other than elementary" have been added.

(2) The words "or in evening schools" have been inserted after "contrary."

(3) The words "unless the context otherwise requires" have been omitted.

(4) In this Act the expression "minor local authority" means the council of any borough or urban district, or the parish council, or (where there is no parish council) the parish meeting of any parish, which appears to the county council to be served by the school. Where the school appears to the county council to serve the area of more than one minor local authority the county council shall make such provision as they think proper for joint appointment by the authorities concerned.

(5) The same as (4) in original form.

(6) The powers of a local education authority under this Act shall include the provision of vehicles or the payment of reasonable travelling expenses for teachers or children attending school whenever the local education authority shall consider such provision or payment required by the circumstances of their district or of any part thereof.

(7) In this Act the expression "college" includes any educational institution, whether residential or not.

(8) The power of a council to supply or aid the supply of education other than elementary shall include power to make provision for the purpose outside their area in cases where they consider it expedient to do so in the interests of their area, and shall include power to provide or assist in providing scholarships for, and to pay or assist in paying the fees of, students ordinarily resident in the area of the local education authority at schools or colleges or hostels within or without that area.

(9) The county councillors elected for an electoral division consisting wholly of a borough or urban district, whose council are a local education authority for the purpose of Part III. of this Act, or of some part of such a borough or district, shall not act or vote in respect of any question arising before the county council as regards matters under Part III. of this Act.

(10) A woman is not disqualified, either by sex or marriage, for being on any body of managers or education committee under this Act.

(11) Same as (6) in original form.

CLAUSE 19.—PROVISIONS AS TO TRANSFER, &C.

Original Form.

(1) The provisions set out in the Second Schedule to this Act relating to the transfer of property and officers, and adjustment, shall have effect for the purpose of carrying the provisions of this Act into effect.

(2) In the application of the Elementary Education Acts 1870 to 1900 to any area for which Part III. of this Act is adopted, the modifications specified in the Third Schedule to this Act shall have effect.

(3) The enactments mentioned in the Fourth Schedule to this Act shall be repealed to the extent specified in the third column of that schedule, but as to the enactments contained in the second part of that schedule, only as respects areas for which Part III. of this Act has been adopted.

As Amended.

(1) "First and" inserted before "second."

(2) *Unaltered.*

(3) *Unaltered.*

CLAUSE 20.—EXTENT, COMMENCEMENT AND SHORT TITLE.

Original Form.

(1) This Act shall not extend to Scotland or Ireland, or, except as expressly provided, to London.

(2) This Act shall, except as expressly provided, come into operation on the appointed day, and the appointed day shall be the *twenty-sixth day of March nineteen hundred and three*, or such other day, not being twelve months later, as the Board of Education may appoint, and different days may be appointed for different purposes and for different provisions of this Act, and for different local education authorities. Any authority given to a school board under the Education Act, 1901, either in London or elsewhere, which would expire on the thirty-first day of July nineteen hundred and two, is hereby continued, and shall have effect until the appointed day.

(3) This Act may be cited as the Education Act, 1902, and the Elementary Education Acts, 1870 to 1900, and this Act may be cited as the Education Acts, 1870 to 1902.

As Amended.

(1) *Unaltered.*

(2) Instead of last sentence read after "authorities:" "The period during which the local authorities may, under the Education Act, 1901, as renewed by the Education Act (1901) (Renewal) Act, 1902, empower school boards to carry on the work of the schools and classes to which these Acts relate shall be extended to the appointed day, and in the case of London to the twenty-sixth day of March, nineteen hundred and four."

(3) *Unaltered.*

Several new Clauses have been added to the Bill, which as we go to press is about to enter on the report stage. The first of the new Clauses, to be inserted after Clause 10, arranges for a new aid grant in lieu of that provided in the Voluntary Schools Act, 1897. There will be, by the new grant, an increase in the Exchequer grant for elementary education, and a change in the mode in which the money is allocated.

Other new Clauses deal with endowments, the appointment of trust managers, and the grouping of schools under one management.

The Schedules to the Bill have also passed through Committee. The changes in many of the Clauses necessitated numerous alterations in the original schedules, and certain new ones have been added, especially important among which is that dealing with the provisions as to the transfer of property and officers.

The second reading of the Bill will be taken in the House of Lords on December 4th and 5th, and the Committee stage on December 9th and 10th.

ITEMS OF INTEREST.

GENERAL.

SIR GEORGE KEKEWICH, K.C.B., has resigned his position as permanent Secretary of the Board of Education, a post he has filled with consummate ability since 1890, when he had already been connected with the Department for twenty-four years. He is succeeded by Mr. R. L. Morant, C.B., than whom it would be difficult to imagine a more suitable permanent Secretary. By his education, his extensive and varied educational experience, and intimate connection with the Education Bill before Parliament, Mr. Morant is peculiarly well fitted to perform the important and onerous duties which will devolve upon him with ability, tact, and, we have no doubt, also with great success.

In the list of Birthday Honours we are glad to see the names of several men prominent in educational work. Mr. Henry Hobhouse, M.P., has been made a Privy Councillor. Mr. Alderman Hoy, the chairman of the Manchester Technical Instruction Committee, is one of the new Knights. Mr. G. C. T. Bartley, M.P., is among the new K.C.B.'s, and Mr. John White, Assistant of the Board of Education, is made a C.B. Among those appointed to the Imperial Service Order are the following: Mr. J. Binnie, sub-inspector of schools, Scotland; Mr. H. Brown, sub-inspector of schools, Board of Education; Mr. T. Healing, sub-inspector of schools, Board of Education; Mr. T. Hodgson, first-class clerk, Scotch Education Department; Mr. J. Macleod, H.M. inspector of schools, Scotland; Mr. G. M. Norris, first-class clerk, Board of Education; and Mr. G. Todd, assistant secretary, Scotch Education Department.

THE President of the Board of Education has appointed Mr. J. F. Hope, M.P., to be a member of the Teachers' Registration Council in the place of Professor Windle, M.D., F.R.S., resigned.

THE new French Minister of Public Instruction, M. Chaumié, successor to the energetic M. Georges Leygues, has this month laid before the Senate a Bill for the re-organisation of the French secondary schools. The fundamental principle is the abrogation of a measure passed in 1850 known as the *Loi Falloux*, which exempted the heads of such schools from the restrictions, as to diplomas &c., imposed in State schools. These persons will henceforth, should the Bill become law, be required to make a statement as to the locality chosen; to produce the diploma of *licencié*, instead of that of *bachelier* which now suffices; to declare that he, or she, does not belong to an unauthorised order; and to submit the scheme of work for the Minister's approval. Women who are not *licenciées* may qualify on a new diploma—to be instituted for the purpose—showing aptitude for secondary school teaching. Inspectors are to report on the *moralité* and hygiene of the schools in question, as well as on the quality of the instruction. The provisions of the Bill seem to be dictated by common sense and wisdom, and it will be a matter of interest to watch its future progress.

In reply to a question asked in the House of Commons by Mr. Plummer, Sir William Anson, Secretary to the Board of Education, stated that under the Education Bill women will be eligible for the board of managers of public elementary schools. They will also be eligible for places on the Education Committee of the Local Education Authority. This is plain from the terms of the Bill. It has always been the declared intention

of the Government. Sir William Anson also referred Mr. Plummer to an answer given by the First Lord of the Treasury to a question in the House of Commons, on April 10th of this year, making the same point clear.

THE Registrar of the Teachers' Registration Council, Mr. G. W. Rundall, has circulated the following information:—"The widespread confusion as to the meaning of 'registration' and 'recognition' seems to call for an authoritative explanation. The former term applies to teachers, and is the function of the Registration Council; the latter applies to schools, and is the concern of the Board of Education. But registration is the avenue to recognition; or rather an application for registration is the proper method of applying for recognition. In plain words, if a school desires recognition, it must send in to the Registration Council an application for registration from a teacher on the staff, either head or assistant. The name of the school is then forwarded to the Board of Education for recognition, and the matter passes out of the hands of the Registration Council until the reply of the Board of Education is received. It is obvious that in many cases considerable time must elapse before the Board can satisfy itself as to the merits of schools; hence delay, and even delay of some length, is unavoidable. It should be especially noted that it is of no avail to send into the Registration Council an application for recognition of a school apart from an application for a teacher for registration. Nor is it of use to forward to the Registration Council prospectuses and information about schools. The Council has no power to pass judgment on schools except for those teachers who apply under regulation 4 (2) (ii.) of the Registration Order in Council and (in some cases) under regulation 5 (2). As to the results of recognition or non-recognition, they must be fairly obvious. The former will secure a school the stamp of Government approval as a worthy secondary school."

At the recent conference, under the auspices of the Private Schools' Association, the subject of "Co-education" was discussed. The debate was opened by papers from Miss Alice Woods and Mr. C. E. Rice. The Principal of the Maria Grey Training College contended that the staff of a school containing boys and girls should be a mixed one, and that the number of men and women should be as nearly as possible equal. The important questions to settle were, Miss Woods said, whether co-education should be continued up to the age of nineteen in schools; the best means to secure worthy members of a staff; what method of discipline should be adopted; and how the question of self-government should be solved. Mr. Rice dealt with the special difficulties and advantages noticeable in class, in games and in free time. Papers were also read on "The Relations between the Home and the Boarding School" by Mr. J. H. Badley, and on "Home and the Day School" by Miss Marion Green. Mr. F. Ritchie introduced the subject of "Inspection." The meetings were well attended and very successful.

MR. CHAMBERLAIN performed the duties of the successful "Old Boy" in a very graceful manner on the occasion of his visit to University College School on November 5th. The object of the gathering was the unveiling of a tablet to twelve Old Boys of the school, to which Mr. Chamberlain belonged fifty years ago, whose lives were sacrificed during the recent war in South Africa. The tablet is affixed to the wall of the school against the drill-room, and fronts the playground. It has been cast in bronze, and is attached to a slab of green marble. In his speech at the preliminary gathering in the botanical theatre of University College, the Secretary of State for the Colonies indulged in some interesting reminiscences, many of them of an amusing character. Mathematical masters of to-day should get

comfort from the consideration that fifty years ago boys were quite as dull as they are now. Mr. Chamberlain said his master used to enforce his teaching "with the oft repeated assertion that 'Never in the whole course of his life had he met boys so bad as we were,' and that 'to attempt to get into our heads the mysteries of algebra was like firing a cannon ball into a mountain of mud.'"

CHERWELL HALL, the new training-college at Oxford for teachers in secondary schools for girls, was opened on October 27th. It is opposite Magdalen College. The governing body of the College is the Council of the Church Education Committee, who have, it is scarcely necessary to say, no mercenary interests to serve. Through the munificence of one supporter, the Council has been able to purchase the property, to furnish and fit up the house, and to start the College as a going concern; but there are no funds for its maintenance. The Council believes, however, that there are many persons of wealth and influence sufficiently interested in and alive to the importance of the training of women teachers for secondary schools to ensure the corporation receiving sufficient funds not only to tide the college over the first few years of its existence, but to provide a permanent endowment, and a liberal scheme of scholarships for young women who wish to become teachers, but to whom the expense of an additional year's training would in many cases be prohibitory. We hope that subsequent events will justify the optimism of the Council.

THE objects of Cherwell Hall are as follows:—(i.) To prepare educated women, who intend to adopt teaching as a profession, for the Teachers' Diploma examinations of the Universities of Oxford, Cambridge or London. (ii.) To give opportunity for an extra year of university life and study. (iii.) To provide a theological course (if desired) for those who will become divinity lecturers in colleges and girls' schools, or who will have to give the religious instruction in the school to which they may be appointed. Miss Mackenzie-Smith is the Principal of the College and she will be assisted by a fully qualified staff; and the work will be carried on in co-operation with the Tutors of the Oxford University Diploma Scheme.

THE President of the Board of Education has appointed Colonel G. Malcolm Fox, late Inspector of Army Gymnasias, Aldershot, as Inspector of Physical Training under the Board.

L'ENTENTE CORDIALE offers for competition two travelling scholarships to students or former students of board schools and other schools where education is free or at merely nominal rates. The successful candidates will be required to spend at least one month in 1903 in France at such time and place as shall be approved by the council of the Association. All candidates must be British subjects, and not have studied in France or in any country where French is the national language. They must be under 20 years of age on December 31st, 1902. The written examination took place on November 22nd, 1902, at 3 p.m., at the City of London Schools, Victoria Embankment, E.C. The *viva-voce* examination will take place (for selected candidates) on December 13th. The examination will be conducted by the Society of French Professors in England. Applications should be addressed to Professor A. Barrère, 97, Elliscombe Road, Old Charlton. Further information to be obtained from Mr. W. H. Sands, hon. sec. of L'Entente Cordiale, 6, Fig Tree Court, Temple, E.C.

A PERUSAL of the new catalogue of Balances, recently published by Messrs. Becker & Co., of Hatton Wall, brings home the fact that this is the age of the specialist. We begin to wonder, in fact, how soon the generalist will become so rare a

feature as to be sought after as a specialist, if such an Irishism can be permitted. Demand and competition have reduced the price of good balances to a figure which would have been looked upon as impossible fifteen years ago, and the list before us is well up to date in this as in other respects. Balances for heavy work receive more attention than usual, and a new form to carry up to twenty kilos with arms in the ratio of 10 to 1 is very compactly made and deserves notice. The useful lever scales, so little used in this country, also find mention. We are glad to see that the excellent balances of Satorius, with their circular arrest and "hole, slot and plane" clamp, are included in the list, though the mechanical merits of this geometrical clamp are not put forward. The list concludes with a description of Messrs. Oertling's balances. Comprehensive, excellently illustrated and printed on good paper, this well-bound little volume deserves a place on every laboratory book-shelf.

THE Report of the Somerset County Education Committee for the year ending March 31st last contains, amongst other interesting information, a tabular statement, compiled with the co-operation of the headmasters of various secondary schools in the county, showing to what extent the county scholarships may be regarded as useful for the purpose for which they were instituted. With this object in view the subsequent occupations are given of county scholars elected during the ten years since the first award was made. The statement shows that, by means of county scholarships, no fewer than nine boys have been enabled to pass from a public elementary school to universities or other places providing the highest kind of scientific and technical instruction available in this country. It is also noteworthy that many of the holders of county scholarships have afterwards entered the teaching profession, and there can be no doubt that the systematic course of study which they have received in secondary schools during their tenure of the scholarships has formed a much better equipment for their subsequent career than the ordinary training of a pupil teacher.

THE Cumberland County Council have decided upon a scheme for the establishment of a technical college at Workington. The County Council will guarantee a loan of £15,000 for building, and the College when complete will be the property of the county. The Technical Instruction Committee guarantee £1,000 a year towards the maintenance of the College and a special rating will be made in its immediate neighbourhood, so that where special benefits accrue a heavier burden will be imposed. It is proposed that in this district a penny in the pound be raised for the maintenance of the College.

THE annual meeting of the Geographical Association will be held in London at the beginning of January when there will be an exhibition of all kinds of ordnance survey maps. An address will be delivered by Sir John Cockburn, K.C.M.G. Further particulars will be given in our next issue.

"THE Schoolmasters' Yearbook and Directory," which, as we announced in our issue for May of this year, is to be published immediately by Messrs. Swan Sonnenschein, is likely to prove an indispensable reference work for educationists of every kind. Part I. will include miscellaneous information on all subjects of importance concerned with schools and teaching. Part II. will contain the names, degrees, experience, &c., of secondary schoolmasters and others connected with the work of secondary education. The number of entries in this list will exceed 6,500. Part III. will consist of some fifteen articles on educational questions by expert writers. Among these may be mentioned "The Education Bill and Secondary Schools," by Mr. Cloudesley Brereton; "Competitions for Open Scholarships," by Mr. W. H. D. Rouse; "Registration and Training of

Secondary Teachers," by Mr. F. Storr; and "The Reform of Mathematical Teaching," by Prof. Minchin, F.R.S.

THE fifth number of the *Teachers' Guild Quarterly*, published on October 15th, contains a short, though highly interesting, contribution on "The Training of Teachers in Secondary Schools for Boys" by the Master of Marlborough. The same number of our contemporary also includes the revised form of the Guild leaflet on "Educational Legislation and the Future of the Higher-grade School," and it is hoped that this re-issue will meet all objections.

MESSRS. CASSELL & CO., LTD., are issuing a new, revised, and enlarged edition of "The Encyclopædic Dictionary," in weekly parts at 6d. each net. The reissue will include a supplementary volume bringing this well-known book of reference up to date, and 76 coloured plates expressly prepared for this edition. Sixteen pages of the supplementary volume (until its completion) will appear in each part.

A SECOND edition of Mr. Jonathan Nield's "Guide to the Best Historical Novels and Tales," published by Mr. Elkin Mathews in May last, and reviewed in our issue for July, 1902, has now been published. We are glad to notice that complete indices both to authors and titles have been added. We repeat what has already been said in these columns, "This book is indispensable for all teachers who believe in the educational value of historical fiction."

WITH the September number of the *Educational Review* of Madras was issued, as a supplement, by the permission of the Government of India, a verbatim report of the Indian Universities Commission, to which we have already directed attention. Copies of the *Review* and supplement can be obtained in this country from Messrs. W. B. Clive & Co., 157, Drury Lane, London.

SCOTTISH.

GREAT indignation has been roused in University circles in Glasgow by the proposal to utilise the present recreation grounds as the site of the Natural History Laboratory. Supporters of this proposal maintain that suitable ground for the purposes of sport can be had outside the college area, while it would be extremely inconvenient to have any of the college buildings outside the present grounds. On the other hand, it is contended that the great benefit of the present recreation ground is that students who have only an odd hour or two to spare between lectures can get necessary exercise without leaving the University. Further, no ground suitable for the purpose in view can be had within reasonable distance of the University, while suitable ground for building purposes would always be available within easy reach of the University. The whole subject came up for discussion at the half-yearly meeting of the General Council of the University. The supporters of the movement to retain the recreation field within the University grounds had matters all their own way. A motion protesting against any encroachment on the only open space available to the students of the University was passed *nem. con.*, and a committee was appointed to support the motion before the University Court.

SPEAKING at Greenock on November 4th, Lord Balfour of Burleigh declared that education was the first interest in Scotland, and was one on which the whole strength of the nation could best unite. As a result of the English Education Bill, an increased imperial grant would come to Scotland next year, and now was the time to take stock of their educational position, and to adapt it more truly to the pressing needs of

their age. He was extremely anxious to make the advance not as a party but as a national movement. If, unfortunately, it should prove that this complete advance was not possible, he was not going to let slip the opportunity of making even a partial advance. The co-ordination of all branches of education under one local authority was his aim, but if that should prove impracticable it would still be his duty to introduce a comprehensive measure dealing with secondary education.

PROF. EDGAR, the newly-appointed Professor of Education in St. Andrews University, in his opening address to the students, said that Scotland was rich in the possession of a national system of education which would compare favourably with that of any country in the world. The system, moreover, was their own. It had grown with their growth and embodied their ideals. If full advantage was taken of it there was no reason to be depressed in view of the struggle for commercial empire.

THE numerous protests from educational associations against the new Leaving Certificate regulations, especially in regard to the preferential treatment of classics as compared with modern languages, has at length called forth an elaborate reply from the Scotch Education Department. The leading points in this apologia may thus be summed up:—(1) The Intermediate Certificate meets the requirements of all who are contemplating a business career, and in this certificate modern languages and classics are placed on an equal footing. (2) For modern-language pupils who remain at school beyond the Intermediate Certificate stage it is proposed to institute a Commercial Certificate with modern languages on the commercial side as the distinguishing feature. (3) The Leaving Certificate proper is primarily intended for those who take a curriculum such as may qualify them for proceeding to the University. (4) As Latin is an essential subject for matriculation in Arts, it has naturally to be given a place in the Leaving Certificate proper. Further, an elementary knowledge of Latin is an essential preliminary to the scholarly study of any modern language.

THE reply of the Department is exceedingly plausible and ingenious, and makes out the best case possible for the present policy. No attempt, however, is made to meet the objections that have been brought against the regulations by practically the whole teaching profession and representative public men. One admission of importance is made in the Department's reply. The Leaving Certificate proper is now explicitly declared to indicate "ripeness for University study." In the circular instituting the certificate it is stated that "the Leaving Certificate proper is intended to mark the completion of a full course of secondary education." "Ripeness for University study" and "the completion of a full course of secondary education" are apparently, in the opinion of the Department, synonymous terms. They still think that there is one stereotyped form of culture and only one, and that with it it is possible to suit the infinite variety of individual tastes and capacities. It is against this narrow view of what constitutes secondary education that protest has been made, and will continue to be made until modern languages are assigned as honourable a place in the school curriculum as classics.

IRISH.

AS the Intermediate Board intimated some time since that they would prefer criticisms and suggestions from the various educational associations before the end of October, that month saw several memorials forwarded to the Board, one of which—from the Roman Catholic Headmasters' Association—was referred to in these columns last month.

THE next in order was that of the Teachers' Guild. Its chief points were: (1) A recommendation that the results of the examinations—marks and prizes—should be published in pamphlet form without the names of schools and students, and with the examination numbers only; (2) a complaint as to the inequalities of marking and as to various anomalies of the recent examinations, and in particular a reference to one typical instance which clearly showed how great an element of chance there was under the present grouping system; (3) suggestions for improvement in the system of groups and courses, especially the Modern Literary and the Mathematical courses; (4) a protest against combining Experimental science and drawing as a single subject; and (5) a suggestion that the papers of honour candidates in English composition should be examined by two separate examiners, the average of the marks assigned by these two being taken as the actual marks of the candidate.

THESE points were also embodied in memorials from both the Schoolmasters' and Schoolmistresses' Associations. The Schoolmasters' Association, besides, called special attention to the unsuitability of certain prescribed books, protested against specialisation earlier than the Senior Grade, and suggested the abolition of the superior age limit in the Preparatory Grade. The Schoolmistresses' Association further protested against a rumour, which has since proved well founded, that a separate and easier course was to be prescribed for girls, objected to specialisation for pass candidates lower than the Senior Grade and for honour candidates lower than the Middle, and suggested that in history the courses should be made continuous from Grade to Grade.

In their October conference the Roman Catholic Archbishops and Bishops' meeting at Maynooth unanimously passed resolutions relating to Intermediate Education: (1) in favour of a consultative committee (which has been also urged by every educational association in the country); and (2) against placing objectionable books upon the programme.

In consequence partly, no doubt, of these memorials, and partly from obvious shortcomings in their system as revealed by recent events, the Intermediate Board have given notice of several important changes. By far the most important is the issuing of a new pass list for the examinations held last June. The percentage of marks for passing in each subject of the programme, except "English composition" and "Experimental science and drawing," is reduced to thirty, the original percentage (except in Greek and German where it was already thirty) having been forty. This only applies to the pass papers. It cannot be too definitely stated that the precedent of altering pass lists after publication is a bad one; as the Board had the power to lower the percentage they should have used their privilege before and not after issuing the first lists. Further, having reduced the percentage on the pass papers, they should in fairness also have reduced the pass percentage on the honour papers.

OTHER important changes are as follows:—(1) The proposed new method of paying exhibitions through the managers of schools, and conditionally on the student continuing his education, is abandoned for the present year; (2) the French course for the current year in the Preparatory Grade is modified, and instead of the whole of Erckmann-Chatrian's "Madame Thérèse" will consist of only chapters i. to ix. inclusive; and (3) a new and easier course is offered for girls in the Junior, Middle, and Senior Grades; instead of being required to pass in six subjects girls will be deemed to have passed the examination if, having presented themselves in three honour subjects in addition to English composition and literature, (a) they pass in English composition and literature, (b) obtain honours in at

least one of the other three subjects, and (c) obtain in any of such subjects in which they do not obtain honours the percentage for a pass without honours. The Intermediate Board will not save itself from the humiliation of making these wide and sweeping alterations in their current programmes until they put themselves in direct touch with the schools, either by such a consultative committee as has been suggested, or by means of an inspectorate that will command the sympathy and respect both of the schools and of the Board itself.

THE Department of Agriculture and Technical Instruction have also given way on the question of the first year's course in Experimental science. Students who may have passed once in this course, but have not passed in the Preparatory Grade as a whole, will be allowed to take the first year's course a second time, but the Department will not make any grant on such students. Such a pass will, however, count as a pass in one of the subjects of the Intermediate programme.

THE Committee organising the conference held in September, at Alexandra College, Dublin, has approved of the proposal made by Mr. Heller to establish an association in Dublin for the discussion of educational topics, and a sub-committee has been formed to draft a constitution. It seems a pity that use could not have been made of one or other of the societies already existing for a similar purpose instead of adding another society to divide the interests of the small number of people in Dublin who really show any practical interest in educational problems and difficulties.

WELSH.

THE training of teachers for secondary schools forms a special department in each of the three colleges, Aberystwith, Bangor, and Cardiff. Theoretical instruction is given in the theory of education, the history of education since the Renaissance, in methodology, school organisation, and the study of special books. On the practical side each student must undertake actual teaching under supervision, and must become acquainted with the organisation and classification of the schools visited for practising. Teaching exercises, criticism lessons, and discussions on educational questions are part of the courses. At Bangor and Cardiff there are departments for training Kindergarten teachers. With regard to the training of secondary teachers, it should be added that there is now a teacher's certificate in the University of Wales. Application was made to the Consultative Committee of the Board of Education for recognition of the certificate in Appendix C of the Order of Council providing for the formation and keeping of a Register of Teachers.

PROF. JAMES WARD, of Cambridge, gave the inaugural lecture of the session at the University College of Wales, Aberystwith. He chose the subject of "Individuality." In the course of a highly stimulative lecture, Dr. Ward said: "The most hopeful sign in this country after fifty years is that it is about to take the step that logically came first of all. It is about to train its teachers. 'Give me the training of the teachers,' said the Bishop of Hereford, 'I count all other matters of secondary importance.' That training will fall into very bad hands if in a generation hence individuality is not the avowed, supreme end of education."

WE alluded last month to the proposal to reduce the fee at the County School at Portmadoc from £5 to £4. It has been decided to adopt this course. It was stated that with seventy-five pupils at £4 the school would be better off than with fifty-six pupils at £5, by £37, through the grants. But it should be borne in mind that the average staffing of the county schools

in Wales is one teacher to sixteen pupils. The increase of nineteen pupils (if the lowering of the fees should be successful in attracting these extra pupils) may therefore have the effect of injuring the present good work, without providing adequately for a further number of the staff. The change hardly seems calculated to effect either a financial or an academic advantage. At Llangollen, on the contrary, a motion to increase the fees from £5 to £6 was carried. It was pointed out that the actual cost was £12 per head, and that the standard of instruction given had been greatly raised. The contrast of policy at Portmadoc and Llangollen is very interesting, and ought to receive more general attention.

It is stated that at the University College of Wales, Aberystwith, in the entrance scholarship examinations, out of twenty-three awards, eighteen scholarships were won by pupils from the county schools of Wales. Since 1896, the number of students in the College have increased as follows: Welsh students from 220 to 291; non-Welsh students, from 138 to 149.

At the Welsh County Schools Association of Headmasters, attention was called to a letter from Miss E. P. Hughes, formerly Principal of the Cambridge Teachers' College, in which she suggested that Wales should send a contribution of exhibits to the Educational Exhibition to be held at Osaka, in Japan, next year. Miss Hughes considered there were points of similarity between Japanese and Welsh education, and that in some ways "points in Welsh education would suit the Japanese a great deal better than English education." The Association, however, as a body, were not prepared officially to commit themselves. At the same meeting the Rev. Prebendary Moss, Headmaster of Shrewsbury School, gave an interesting and valuable address. One point in the address is of very general interest. Mr. Moss had looked over the memoranda of Dr. Butler and found some references to his famous pupil, Charles Darwin, but it was obvious that he had not the faintest presage of the greatness to which he would one day attain. Was it possible, he asked, that "some of them were stricken with a similar blindness?"

CURRENT HISTORY.

IN China, they sometimes give honours to a man recently deceased which we give him only when living. Liu Kun-yi, for example, the late Viceroy of Nanking, has been made an earl, and his family will shortly receive rank and office. We are reminded thereby of the custom of the pre-Reformation Church, and of that branch which still obeys the Bishop of Rome, to decree the honours of beatitude or sainthood to her worthies. Only, Rome generally requires some considerable time to elapse before posthumous honours are thus awarded. It is rare, for example, to have such a speedy sanctification as fell to the lot of S. Thomas of Canterbury. [It is interesting to note that in this instance English law in the time of Henry VIII. deprived the hero of his sainthood.] The church of Western Christendom has sometimes decreed posthumous dishonour, and "heretics" have been burned after death, even as the triumphant Episcopal party in England hanged Oliver Cromwell in 1660. Can China, we wonder, be like us Westerns in this too?

WE remarked last month on the polyglottism of Austria-Hungary and of the German Empire. Since then we have noted references in the papers to the same feature in France and in the United States of America. It is "rumoured that the French Government are about to forbid sermons to be preached in Breton, and it is remarked that, if this is true, they will have equally to prohibit Basque and Provençal." Even "the Republic one and indivisible" has not yet attained linguistic uniformity. And the *Staats Zeitung*, a German paper published in New York, says that German has since 1848 ousted French

from the valleys of the Mississippi and the Missouri and looks forward to still greater triumphs for their "mother tongue." "Brother Jonathan" has been descending gradually during the last quarter of a century towards the level of "effete" Europe. He has now foreign possessions, he has become warlike, and is becoming a "world power." He has made advances towards monarchy. Will he also have a language, *i.e.*, a race-problem, to solve? As yet he has been able to assimilate and anglicise. But it does not seem so certain now as it used to be, that Italians and Germans, Chinese and Africans, will be so easily absorbed into the Anglo-Saxon republic.

PARLIAMENT is sitting in the autumn: yet there is not an Autumn session. It was not prorogued in August, only adjourned. We recommend our readers to be pedantic in matters of constitutional law, and to insist on at least their elder pupils doing the same. So much often depends on the right use of terms and on care in understanding and in using them. Sittings of Parliament are ended in three ways. Each house adjourns from day to day or over the holidays. The King puts an end to a session by prorogation, after which almost all business must be begun again *de novo*. The King puts an end to a parliament by dissolution, after which there must be a general election of the House of Commons, and an election of representative peers for Scotland. We have sometimes seen examination papers in which the candidates seem to think Parliament is a standing body, like "Pharaoh" and "the Pope" as they are commonly and confusedly conceived. Especially is this the case with the "Long Parliament" of 1640. Because it was not finally dissolved till 1660, our pupils think that it existed all through the "Commonwealth" period and confuse it with Oliver's assemblies. Note also the interesting question of 1629 when Charles ordered the House of Commons to adjourn, and instead of adjourning at his wish, as they had always done before, they held the Speaker down and passed three famous resolutions. If Charles had only had the sense to prorogue!

Question. "The Emperor William was present at the unveiling of a monument to the Great Elector at Fehrbellin on Saturday, and delivered a speech laudatory of the services of the Elector and the men of the Mark in laying the foundations of German independence and greatness." Comment and explain. Connect it with English history.

Answer. In 1670, England joined in alliance with France (Treaty of Dover), and in 1672 Sweden did the same. In 1672, Louis XIV. made war on the Dutch, who were joined in 1673-4 by the Emperor (Austria) and by Frederick William, "Markgraf" of Brandenburg, Elector of the Holy Roman Empire. There were at least three arenas of war. The French invaded the Netherlands (1672). The Dutch cut their dykes and revived the stadtholdership in the person of William III. of Orange-Nassau. The English fought the Dutch at sea (1672-4) and then made peace. In 1677, William married his English cousin Mary, and England helped in the mediation by which the war was ended at Nimwegen (1678). Frederick William led his subjects of the mark of Brandenburg against Pomerania, which belonged to Sweden, and won the battle of Fehrbellin, 1675. His enthusiastic people hailed him for this victory as the "Great Elector," and he hoped to secure Pomerania for his own. But at the Peace of Nimwegen France supported Sweden in refusing to cede territory, and Frederick William was forced to give way. Henceforward he hated the French, and when William III. was planning that invasion of England in 1688, which was the first campaign in a new anti-French war, the Great Elector, on his dying bed, gave for the watchwords of two successive nights, "London," "Amsterdam." His son was the first King of Prussia. Six generations later, his descendant was the first "Kaiser in Deutschland."

RECENT SCHOOL BOOKS AND APPARATUS.

Modern Languages.

Les Deux Fées and other French Plays for Children. By Violet Partington. 64 pp. (Horace Marshall.) 9d.—Miss Partington has acquired a well-deserved reputation as a genial and skilful teacher of French, through her work at the King Alfred's School, and now at the Queen's College School. She has realised the value of simple plays for stimulating interest, and has written, with the collaboration of her elder pupils, a number of short plays which she has rightly decided to publish. The language is simple, there is plenty of action, the costumes and "properties" required need give no trouble, and the spirit pervading the plays is admirable. We recommend this little book very warmly.

Black's Illustrated Term Readers. Cours Élémentaire. (1) *L. Charleville, Contes et Préceptes.* 30 + xvi. pp. (2) *A. Vessiot, Rires et Larmes.* 32 + xvi. pp. (3) *Mrs. F. G. Fraser, Berthe aux Grands Pieds.* 31 + xii. pp. All three edited by F. B. Kirkman, B.A., and published at 6d. each. (Black).—The first and second of these neat and attractive little books contain short stories, in most cases followed by poems more or less closely connected by the sense. Some useful illustrations are added; the majority of them are the work of M. Vial, with whose "grey-and-white" work we are becoming familiar. He is conscientious with regard to detail; but his drawing is sometimes unpleasing, e.g., in the frontispiece to *Rires et Larmes*, which suggest a photograph out of focus, and the picture on page 28, where the arms are quite out of proportion. The editor's work has been done well; the proofs might, however, be read a little more carefully; and the vocabulary is not quite full enough in (1) and (2), while it is altogether insufficient in (3). *Berthe aux Grands Pieds* is an interesting contribution to our French reading-books; though probably the general editor would have done better to include it in his *cours moyen*. Mrs. Fraser shows great skill in telling the ancient tale: but there are still so many old or unusual words (e.g., *pers, maint, allégresse, briguer*) and turns of phrase that we should not think it expedient to put this book into the hands of beginners. That there should be no reference to the fairy tale of Snow-white, not even in Mrs. Fraser's address to "my young readers," is a curious omission.

Eckmann-Chatrion, Histoire d'un Conscrit de 1813. Edited by A. R. Ropes, M.A. xviii. + 276 pp. (Pitt Press.) 3s.—We are again in a position to congratulate Mr. Ropes on his editorial work. This is the fourth novel by Eckmann-Chatrion that he has prepared for the Pitt Press, and he is thoroughly familiar with every aspect of their work. He supplies a clear and helpful introduction and notes which are admirable. We have hardly a criticism to offer on matters of detail. Mr. Ropes has given up almost entirely the technical terms of Latin grammar of which he used to be so fond. May we plead for the removal of the term "phonetic corruption"? We have noticed very few misprints (p. 219, read *heimatlos*; p. 248, *Commers*; p. 250, *Druck*; p. 256, *Schnaps*).

Schiller, Select Ballads. Edited by Frieda Weekley. 43 pp. (Blackie.) 6d.—A neat selection of seven ballads and some other poems by Schiller, with a brief introduction and useful notes. Some remarks on Schiller's impure rimes and on his metre generally would have been welcome.

Edited Books.

John Ruskin. By Frederic Harrison. English Men of Letters. 216 pp. (Macmillan.) 2s.—Mr. Frederic Harrison's Life of John Ruskin is one more of the attempts now become common to write an account of a great man which shall nevertheless be compressed into comparatively small space. Probably it is for the good of literature at large that critical monographs should multiply: certainly it would have been impossible to keep Ruskin for long out of Messrs. Macmillan's series of Men of Letters. Consequently its inclusion in the new issue was inevitable; and the execution of his task has found Mr. Frederic Harrison in a consistently happy mood; wherefrom it results that, on whatever estimate one finally judges his performance, the whole volume is singularly delightful reading. Mr. Harrison has accomplished a difficult task with singular moderation and a reticence for which one would praise him if it were not so well known that his taste is unerring, and not in the least likely to go astray in such a matter. His estimate of Ruskin comes to be that "his dominant tone of mind was a mysterious amalgam of John Knox, Carlyle, and Walter Scott." There is a sense undoubtedly in which this is quite true; but it must not be forgotten that, whatever Ruskin might owe to these three sources of inspiration, neither Knox, Carlyle, nor Scott would probably have been pleased to be called to account for his share in the finished product! Ruskin's pathetic love stories are dealt with very tenderly and charmingly in this volume; the last one, with regard to Rose La Touche, will, we fancy, be quite new to all except those in the *cerle intime* of literature. And the charm of Ruskin's personality is duly dealt with. "Not only was he in social intercourse one of the most courteous and sweetest of friends, but he was in manner one of the most fascinating and impressive beings whom I ever met." We wish we had space to deal with John Ruskin's social theories, and to call to the remembrance of many who are on the point of forgetting it his wonderful scheme associated with fellowship among the Companions of St. George.

The Lay of Havelok the Dane. Edited by Professor W. W. Skeat. lx. + 171 pp. (Clarendon Press.) 4s. 6d.—The interest of scholars in Anglo-Saxon literature is being steadily stimulated by the splendid editions of works possessing the highest literary value which the Clarendon Press is continually having edited. To that already considerable collection the addition of Professor Skeat's volume now under notice is noteworthy. It does not make a big book, but the amount of careful scholarship expended upon a text of only three thousand and two lines is very great. The interest for the lay mind, as contrasted with the academical, concerning "The Lay of Havelok," lies in the circumstance of its comparatively recent discovery, accidentally, in an old Bodleian manuscript known as the "Vitæ Sanctorum," in which it was placed cheek by jowl with the recently edited "Geste of King Horn." Havelok was not pre-eminently a saintly character, but his legendary connection with Lincolnshire, the fairly established theory that the poem represents the Lincolnshire dialect of those early days, and the inclusion of an illustration of the Seal of the Corporation of Grimsby whereon Havelok and his wife Goldburgh figure, give an undoubted charm to the circumstances of the discovery. Moreover the connection between Havelok and Hamlet is of interest to Shakespeare students. Needless to say, Professor Skeat has admirably illustrated every point of interest in the poem. The introduction is of value mainly to somewhat advanced scholars, but the notes are worth reading by many who take an antiquarian rather than a philological interest in very old legends.

The Select Chaucer. By J. Logie Robertson. xlvi. + 109 pp. (Blackwood.) 3s.—Mr. Robertson's educational works are by this time well known; and this volume will distinctly add to his

reputation. This work falls into two parts, which may be obtained separately; the first is concerned with the "Canterbury Tales," the second with very considerable selections from the so-called Minor Poems. Each poem is introduced and annotated by remarks necessary to show its inherent structure and merit. The introduction is well done, and the chronology of Chaucer's life is a careful piece of work. The sections which treat of the Chaucerian grammar, spelling, and versification have also the merit of being very clearly put, yet of occupying very few pages. In giving an account of Chaucer's career, Mr. Robertson has happily refrained from assuming the critical tone which the editors of schoolbooks are so prone to adopt. He writes a clear and spirited account of the man, and leaves literary criticism to other hands.

Kingsley's Heroes. By Prof. Ernest Gardner. xxii. + 178 pp. (Cambridge University Press.) 2s.—This edition ought for school purposes quickly to supersede any other at present on the market. It is the best attempt to make one of the most charming of children's books subserve the purposes of general education. With great self-restraint Prof. Gardner has managed to accomplish his task without importing into these pages too much learning. It remains a children's book, and the notes are nothing more than explanations of the few points which Kingsley himself did not make sufficiently clear. The illustrations are numerous, and sufficiently vivid. There are two maps which will appeal to teachers; but the colour scheme of white and blue is a little appalling.

Scott's Marmion. Edited by R. P. Davidson. xxxi. + 246 pp. (Dent.) 1s. 4d.—Although this is confessedly a school edition, one is not in the least surprised to find in it the same features of artistic excellence which mark all the work which is done by Messrs. Dent. The illustrations scattered broadcast over these pages, and from first to last very beautifully executed, give it a unique charm and constitute quite half of its attractiveness. The editorial matter is well arranged but contains no novel features or information. Who, indeed, can hope to be in the least degree original in preparing a school edition of Scott? But the introduction is careful and scholarly, and the section of it which deals with the anachronisms in "Marmion" is excellent; that which deals with Scott's versification is all but needless. The notes have been well done. Altogether an interesting educational venture, which deserves attention.

Bunyan's Pilgrim's Progress. By E. E. Smith. 220 pp. (Black.) 1s. 4d.—The sight of this volume was an unexpected joy. Seldom has Bunyan's immortal allegory displayed its potentialities in a better form. As a school book its beauty and simplicity ought to make it of untold value, for, like some books on the heroes of Greece, it has a way with it which kindles the imagination. The editorial "effort" is limited to a very few pages of introductory matter and there are no notes whatever; so that Bunyan may make his own proper impression upon a youthful reader, and the theological aspects of his work are not even touched. This is an unmixed blessing; the more so as the best of all commentaries is supplied by nineteen woodcuts, many of which are charmingly effective. Simple as they are, one would like to draw attention to the ideal Mr. Worldly Wiseman, to the Interpreter, to Knowledge, and to that Lord Hategood to whom the artist, perhaps remembering Bunyan's epoch, has given a striking resemblance to Judge Jeffreys.

English.

A College Manual of Rhetoric. By C. S. Baldwin, M. A., Ph. D. xv. + 451 pp. (Longmans.) 4s. 6d.—Mr. Baldwin is the Assistant Professor of Rhetoric in Yale University; hence, remembering the high degree of importance that is rightly given to this subject throughout the American school-system, we

naturally expect something worth reading from the author's pen. Nor are we disappointed. The book is confessedly written for college students; it is, therefore, of a rather advanced type. It consists of two parts. In Part I. the principles underlying the art of (a) "logical" composition, *i. e.*, *persuasion and exposition*, (b) "literary" composition, *i. e.*, *narration and description*, are clearly enunciated and illustrated. Herein the student is taught how to express his thoughts. In Part II., hints are given on the means of expressing himself, for it is quite true, as the author remarks, that "style" can be learned—that is "that use of words by which they convey more than their dictionary meaning, the stamp by which they have more than their bullion value." We have read Part II. with considerable profit and interest; Mr. Baldwin's style is eminently lucid and persuasive. There is a copious supply of apparatus in the form of theme-subjects, notes, analyses and illustrations generally, and when the art of rhetoric becomes more widely appreciated in this country we predict for this manual an extensive *clientèle*. It certainly deserves to be widely read.

Matriculation English Course. By W. H. Low and J. Briggs. 328 pp. (Clive.) 3s. 6d.—At present this is the only book on the market specially designed to cover the requirements of the new English syllabus for the reconstructed Matriculation examination. We use the term "market" deliberately; for a volume written in extreme haste to serve as a text book for a specific examination must be judged by commercial rather than educational standards. On the whole, it performs its advertised functions quite satisfactorily. It contains concise rules for analysis, more lengthy advice concerning composition, somewhat scanty directions for paraphrasing, and a summary of the main principles to be observed in *précis*-writing. In the hands of a thoughtful student, or a good teacher, the book will prove distinctly useful, as marking out the ground to be covered. In addition to the above contents, however, there is an introductory section of over one hundred pages (a third of the book) on grammar. This strikes us as quite superfluous. Mr. Briggs defends its introduction on the grounds that analysis, composition, and the rest, "involve syntax and general grammar," and even a knowledge of "the history of the language and of the manner in which it is represented in writing." That, no doubt, is true. A knowledge of the alphabet and of the elements of calligraphy is also involved. We think that an acquaintance with the more elementary portions of the subject might have been assumed, and that the space taken up by the epitome of English grammar might better have been devoted to extra exercises in paraphrasing and *précis*-writing.

Further Notes on the Teaching of English Reading. By Nellie Dale. i. + 271 pp. (Philip.) 3s.—Miss Dale's clever and suggestive books are now becoming known, and many teachers are trying to follow in the steps of one whom we have heard described as "inspired." This book is rather a commentary on preceding books and on an accompanying volume than a complete exposition of the method. Enough is said, however, to make the method clear and fascinating to anyone dealing with young children *in moderately small numbers*. First get the children to talk: then let them analyse their words to discover the sounds: then let them discover how the sounds are made: and then have the sounds and their symbols represented and learnt, coloured chalks being used on the blackboards. All this is to go on with chats, story, drawing and song. But the title of these books should be "The Child's First Book." The method used is a combination of talking, drawing, colour work, singing, reading, writing, composition and nature study. A great deal of this combination in teaching has been used time out of mind in the nursery, to which it seems in many of our books we are hesitatingly and sheepishly returning. Any teacher who finds

the teaching of reading and kindred subjects dull and difficult (and some teachers will find any subject dull and difficult) may be recommended to dip into this interesting work. But we do not fancy the method will succeed unless the inspiration is forthcoming; and the handing on of the inspiration is surely the justification of such books as this and of such teachers as Miss Dale. One of the saddest verses in the whole of literature is the well-known and often repeated cry, "He that hath ears to hear, let him hear."

History.

Alfred to Victoria. By G. Eayrs. 250 pp. (Sonnenschein.) 2s. 6d.—This book consists of short sketches of typical men from each century. The heroes are Alfred, William I., Francis of Assisi, Simon de Montfort, Dante, Wycliffe, Luther, Shakespeare, Cromwell, Wesley, Gladstone, Lincoln, Victoria. There are portraits of each, date lists, a short bibliography and an index. To quote from the preface, "the book is not intended for students, but rather for general readers . . . very much must be omitted from a brief work like this, and, despite all care, some errors may have escaped notice." The sketches are well written, and with enthusiasm. The bias is somewhat Protestant, but we can heartily recommend the book to our readers. In these days of dull text books, we have found it a refreshing oasis.

My Adventures during the late War (1804-14). By D. H. O'Brien, ed. C. Oman. xxvii. + 340 pp. (Edwin Arnold.) 7s. 6d.—Mr. Oman has reprinted the memoirs of O'Brien, an Irish sailor in George III.'s service, who was shipwrecked in the west of France, imprisoned by Napoleon's government, and three times attempted an escape, the third attempt being successful. He gives us a brief preface from which we learn that we might almost call this book "the real Peter Simple," a biography and portrait of the author, a map and brief notes, corrective and explanatory. Our thanks are due to him for this book. It is most interesting from cover to cover, and will make a splendid addition to any school library. If all "authorities" were like this, our schoolboys would take to "research" like ducks to water. We heartily recommend the book to all our readers.

Essentials of American History. By T. B. Lawler. 420 pp. (Ginn.) 4s. 6d.—This is a text book of the history of the United States of America adapted for schools in that country. It is well illustrated with maps, coloured and otherwise, and pictures. There are summaries, questions, tables of Presidents and States, and an index. The text is well written and clearly printed. We notice, however, a tendency to repetition, and to putting the most important information in footnotes. American text books always betray the non-existence of an established church in that country, and this book tends to dwell more on Roman Catholic activity than on that of any other branch of the Christian church.

From the Old World to the New. By M. S. Dickson. xv. + 197 pp. (Macmillan.) 3s. 6d.—This book consists of the story of the settlement of the North American colonies by the various European nations, told for school children in that country. It contains a wealth of illustrations, suggestions to teachers, a plan of work, and, for each chapter, "things to remember" and "things to do." It is well written, and we can heartily commend it to those who have the time to tell history in a leisurely fashion. It has made two impressions on us; first, that teachers in the United States of America want much guidance, and, second, that there either very young children learn "advanced" history, or that elder children want things put in very simple language. The detailed story is told in such quaintly simple language.

English History illustrated from Original Sources. 1399-1485. By F. H. Durham. xiii. + 141 pp. (Black.) 2s. 6d.—This volume is divided into two parts. Each contains an introduction, selections from contemporary writers, followed by a bibliography, date summary and genealogical tables. There are pictorial illustrations. The whole is very good, and we heartily commend the work to our readers.

Geography.

The Sydow-Habenicht Series of Physical Wall Maps. North America. (Geo. Philip & Son.) 28s.—This new map of an old series is excellent for class purposes. It is of the now familiar "green-and-brown" type, and from the back of a large class-room has all the appearance of a map in relief. As it is absolutely necessary in teaching geography—historical, political, commercial, or any so-called branch thereof—to use physical geography as a base, wall maps should always show a strong physical tendency, and none that we have seen fulfil this condition better than these Sydow-Habenicht productions. In the particular map under review, North America, the great general features of the continent are markedly prominent, the huge area occupied by the Rockies and their foothills, the Mexican and Greenland plateaux, the dip of the Great Basin, the plains of the centre, the Mississippi valley, and the Canadian waterway. Round the coast the light-blue tint brings equally into notice the interesting banks of Newfoundland, the shelf of the eastern coast, and the submarine ridge which connects North and South America. All these features are visible to the shortest-sighted boy or girl in the class from any point of view. For the eye of the teacher, or the class gathered round the map, are inserted other useful but unobtrusive details, to wit, limit lines of the cultivation of maize and winter cereals, coffee and tropical vegetation, &c., wherein are clear to all the depressing climatic influences of the western altitudes and the exalting powers of the Pacific breezes. Political boundaries are shown by red lines; the most important towns are indicated by means of red circles and initial letters, and a few smaller towns are inserted in hair lines for the purpose of localisation. It is in the names printed that we notice one or two slight drawbacks and defects: "Jukon," "Sitcha or Neu-Archangel," and the curious abbreviation "Harris's," betray the remote origin of the series, even if the words "printed in Germany" did not appear in certainly the tiniest of tiny type under the title and explanatory label; "Klonidike" is shown as a town instead of a river or district; Mount McKinley is not inserted, though one notices the lesser elevations of comparatively recent notoriety, Logan and Wrangel. But these are details, and they do not affect the value of the map for class teaching. For the rest, the map is 68 x 60 inches, and the scale is 1: 6,000,000, or just under 100 miles to the inch. One very great improvement on the earlier issues is at once apparent, viz., an inset map of the British Isles on the same scale. To our mind this alone at once doubles the educational value of the new series. Nevertheless, the publishers have missed an opportunity in this self-same inset; they should have inserted the meridian of Greenwich and parallels 50° and 60° N. for purposes of comparison.

Coloured Visual Memory Maps. By J. Bernard-James. (Philip.) 2d. each.—A series of maps of the continents, with the various geographical features marked by differently coloured figures and letters. Each is accompanied by a key.

Sixpenny Atlas of Comparative Geography. (Philip.)—This atlas consists of a selection of the maps used in Philip's Elementary Atlas of Comparative Geography.

Short Geography of the World. By G. F. Bosworth. vi. + 197 pp. (Macmillan.) 1s. 6d.—The sub-title is "a new handbook for teachers and students." There seems little that

is novel either in its arrangement or its statements. A large proportion of the book consists of lists of capes, products, etc. The Gulf stream still influences the climate of our country; the Kong mountains were disposed of years ago, yet they re-appear in Mr. Bosworth's book. We find "Hwangho" on the map of China, but "Hoang-ho" in the text; similarly "Khartoum" and "Khartum." The map of North America lacks a scale of miles.

Commercial Geography of the British Empire. By E. Protheroe. ix. + 202 pp. (Nelson.) 1s. 6d.—Mr. Protheroe has done his work well, and has produced a work interesting to the "man in the street" and the student alike. Not the least valuable features of this new commercial geography are the comparative diagrams and the maps, on many of which circles indicate the distances from London. We can thoroughly recommend the book.

The fourth number of *The Geographical Teacher* (Philip), 1s., contains several good articles, including one on the one-inch Ordnance Survey Map of the district round Oxford by Dr. Herbertson, one of the co-editors. We are looking forward to the second article by the same author on the "World as a Whole," promised some time since.

Science and Technology.

Physical Geography. By Margery A. Reid, B.Sc. With maps and illustrations by Bertha Reid. 148 pp. (Allman.) 2s. 6d.—This pleasantly written book suffers from being a little too ambitious. So many subjects are introduced that, with the space available, excessive brevity has been necessary, with the result that there are cases where the amount of explanation is insufficient to render the subject intelligible to young students. For instance, the disintegration of rocks by frost is described on p. 108, and the only explanation which we have been able to find of the change in volume which water undergoes as its temperature falls is the following sentence: "If water sinks into the joints of any rock, or into the pores of any porous rock and there freezes, it expands, and in doing this breaks up the rock." Not only is this explanation inadequate, but it is open to more than one objection. Similarly, the explanation of the tides on pp. 78-81 is unsuitable for beginners. Other instances might be added, but these will show that the book by itself is scarcely enough for the needs of boys and girls, though if supplemented by the explanations of a good teacher it would obviate the necessity for much note-taking. The thirty-five illustrations are mostly of a simple and helpful character.

Advanced Hygiene. By Alfred E. Ikin, B.Sc., and Robert A. Lyster, M.B., B.Sc. viii. + 300 pp. (Clive.) 3s. 6d.—This is a continuation of Mr. Lyster's elementary book which was reviewed in our issue for August, 1900. As was also said in writing of the preliminary volume, a student who masters the contents of this book will probably pass his examination with credit; but at the same time he will scarcely have a thorough acquaintance with the numerous subjects of which the authors treat. To give an instance, one heading of the syllabus of the Board of Education for the advanced stage examination of which the book is intended to be a preparation, is "school hygiene"; on looking up the text-book we find the subject is disposed of in a little over two pages, school furniture being described in twenty lines. Similar cases of excessive condensation might be given. Yet the information is accurate, the descriptions are clear, the book is nicely printed, and wherever possible a tabular arrangement of the matter makes the mastery of the contents of the book as easy as may be for the student. The illustrations, of which there are eighty-seven, are simple and generally very helpful in making the text plain.

The Teaching of Chemistry and Physics in the Secondary School. By Alexander Smith, B.Sc., Ph.D., and Edwin H.

Hall, Ph.D. xiii. + 377 pp. (Longmans.) 6s. net.—As Prof. Armstrong said recently at the meeting of the British Association in Belfast, "If teachers would pay more attention to theory their teaching would doubtless be more fruitful of results; facts they know in plenty, but they lack training in the considered use of facts." Profs. Smith and Hall have, in this latest addition to the American Teachers' Series, set themselves to consider a number of important questions about which all teachers of chemistry and physics should have made up their minds before entering upon the actual work of instruction. It is only necessary to enumerate a few of the subjects discussed to show that the teacher will here find guidance in solving problems which present themselves to every young man of science who finds himself responsible for the scientific training of a class of boys or girls. Among the difficulties which confront the young teacher, which are here dealt with by authorities of experience in a luminous and helpful manner, the following may be mentioned:—On what grounds is the introduction of instruction in chemistry and physics into the school curriculum to be regarded as imperative? Which subject should first be studied, chemistry or physics? How should these sciences be introduced to beginners, and in what order should the subjects they include be taken up so as to secure the best results? What has previous experience shown to be the best arrangement of the laboratory, what equipment is absolutely necessary, and what may be regarded as accessory? What part, if any, should the text-book take in laboratory work? All these considerations are treated with great fulness in a thoroughly practical manner, and since the authors have an intimate acquaintance with the world's literature of the subject, and are conversant with the views of men of science in all the chief countries where education in science is regarded seriously, the teachers who read this book will be placed in possession of material of real value in connection with the teaching of chemistry and physics in schools.

Introductory Chemistry for Intermediate Schools. By L. M. Jones, B.Sc. 191 pp. (Macmillan.) 2s.—The contemporary teacher of practical chemistry must experience much anxiety in determining which text-book, of the many now available, is most suited to the requirements of his students. Some of the published texts are too lengthy or too special in their requirements of material, and some lack all trace of improved methods. The volume under review cannot be accused in either of the above senses, for, though it is based throughout on the "research" method, it is nevertheless simple, readily within the scope of the most elementary laboratory, and possesses several exercises of an original nature. It is primarily intended for Irish Intermediate schools, but it would fully meet the requirements of any secondary school, unless the Board of Education Examination (elementary stage) is to be taken, when a more complete treatment of the identification of common substances is necessary. After preliminary chapters on the examination of a few common substances, on solution, evaporation, &c., it proceeds to a full investigation of the action of heat on metals, on rusting and combustion. Subsequent chapters are devoted to Air, Oxygen, Hydrogen, Water, Chalk, Oxides of Carbon and Carbonates, Coal-gas, Salt and Nitre, and Acids and Bases. The text is illustrated by seventy diagrams. On p. 140, l. 13, *gas* should read *flask*; and on p. 158, l. 23, *carbon* should read *oxygen*.

Science Teaching and Nature-Study. 48 pp. (Southampton: H. M. Gilbert & Son.) 6d.—A careful perusal of this report of the conference and exhibition held in June last at the Hartley University College, Southampton, will do much to remove the ambiguity which, unfortunately, still attaches to the term "Nature-Study," and will explain the enthusiasm which the movement has aroused among educationists. The papers by

Mr. T. G. Rooper, Mr. A. T. Simmons, and Mr. Hedger Wallace will be found especially useful and stimulating by teachers, as they describe methods of teaching the subject which have already proved highly successful in actual practice.

Mechanics: Theoretical, Applied and Experimental. By W. W. F. Pullen, Wh.Sc. vi. + 381 pp. (Longmans.) 4s. 6d.—This is a praiseworthy attempt to co-ordinate the subjects usually designated by the names theoretical and applied mechanics and to explain the application of the principles of the former to the solution of problems in the latter. If the subjects named are to be of any real use to a student, it is probably impossible to dissociate one from the other, and this volume, with its clear descriptions of suitable apparatus and necessary instructions how to carry out experiments in a laboratory, is a distinct advance on the usual methods. The author refers to the "distressing ignorance of the simplest of mathematics shared by some students," and hence the pages are arranged for those who have little beyond the elementary notions of arithmetic and geometry together with the ability to solve a simple equation. There are throughout the country so many facilities for students to acquire the small amount of mathematics required for an elementary course in this subject that it will seem to many teachers to be a retrograde step to omit the simple and powerful methods of trigonometry. There is much to commend in these chapters; the numerous worked-out examples and the applications of squared paper are all carefully selected and explained, and will tend to give a student clear ideas on the various sections of the subject. In addition, the comparatively large number of exercises with answers will serve to test the information acquired.

The Principles of Logic. By Herbert Austin Aikins, Ph.D. iv. + 490 pp. (Bell.) 6s. 6d.—There is such a multiplicity of text-books on logic that every new one requires a somewhat strong justification for its appearance. We are of opinion that Dr. Aikins' book is a particularly strong text-book. It has the freshness and spontaneity which characterises American thought, a characteristic especially valuable for logic-teaching. Dr. Aikins has deliberately set himself to put aside the reduction of argument to a given verbal form, and has accordingly omitted the traditional rules of the syllogism, "and put in their place a direct statement of the principles on which we reason in the different figures." The consequence is that his book produces much more interest in logical material of thought than is common in text-books of logic. Many of his chapters are very interesting in treatment, even in naming, e.g., *Blunders in Word and Blunders in Thought*; *The Forgotten Issue*; *The Ill-Conceived Universe*; and a very suggestive chapter on *Testimony*. The student will find attraction in the simplicity and directness of such a chapter as that on *The Three Ultimate Tests of Truth*. Many of the examples shown are striking, and press home the point to be illustrated with conviction and interest. It is a book that may well be read along with a formal text-book written on the lines of more distinctively formal logic. Dr. Aikins' book would be a particularly good one for the general reader who wished to see the significance of logic, or for the student who was desirous of gaining a knowledge of logic without entering fully into the symbolic and formal aspect of treatment.

Trees in Prose and Poetry. Compiled by Gertrude L. Stone and M. Grace Fickett. xi. + 184 pp. (Ginn.) 3s.—It has been properly objected that "reading odds and ends about Nature" is not Nature-Study; but such a school-reader as the present, if used in conjunction with out-of-door observation, will be of great value. The aim of the compilers has been to bring together the best literature—legendary, historical and fanciful—that has been inspired by our common trees, and the result is a most attractive little book. It is well illustrated by eleven reproductions of photographs.

The Story of Animal Life. By B. Lindsay. viii. + 208 pp. (Newnes.) 1s.—This volume of the Library of Useful Stories is an interesting *résumé* of the principles of modern zoology; but it seems to us to be needlessly technical, and the facts are occasionally expressed in rather inexact language. It contains forty-seven useful figures.

School of the Woods. Some Life Studies of Animal Instincts and Animal Training. By William J. Long. Illustrated by Charles Copeland. xiii. + 364 pp. (Ginn.) 7s. 6d.—Mr. Long always succeeds in making nature study a fascinating subject. Like other books of his, reviewed from time to time in these columns, "School of the Woods" will immediately secure the approval of boys and girls. There is no indiscriminate attribution of animal ingenuity and dexterity to an instinct. Mr. Long believes that the parents of the wood teach their children in much the same way as those foster parents, the teachers, educate human infants. He has often watched such lessons in the schoolroom of nature, and many of the demonstrations at which he has been an unbidden guest are here described with much literary ability. With the assistance of Mr. Copeland, whose illustrations are excellent, the author has provided a delightful gift-book for Christmas distribution.

Mathematics.

Junior Arithmetic Examination Papers. Arranged by W. S. Beard. vi. + 106 pp. (Methuen.) 1s.—In this there are ninety papers, each of ten questions, and the range is from the first four rules to recurring decimals, square root, true discount and the rest. The arrangement seems fairly satisfactory, and each paper is of graduated difficulty. Mr. Beard has been unable to dismiss the thought of examination syllabuses: hence, we suppose, the tiresome reductions such as "Find to three places of decimals the number of acres in a hectare," and questions like "Find the value of $2^{\frac{1}{5}} 9^{\frac{1}{3}}$ of 7 days 5 hrs. 30 mins.," the answer to which, by the bye, is given as 15 days 14 hrs. $36\frac{3}{4}$ mins. Cannot examiners be induced to give up setting such useless, absurd questions as these? But Mr. Beard's collection is not worse than others of its kind; even on the metric system there are some sensible questions.

Examples in Algebra. By C. O. Tuckey, B.A. vi. + 178 pp. (Bell.) 3s.—A very good collection, inspired by the recommendations of the Mathematical Association Committee. There are plenty of oral exercises; questions involving applications of algebra to geometry, mensuration, and other practical things; and continual suggestions of checks to calculation. The scope of the work includes the binomial theorem and logarithms; and the arrangement and grading of the exercises seems to have been done with much care. It may be added that the print is quite clear. The *solidus* is not introduced, which is a pity; and perhaps it would have been well to give more examples of the use of Σ and of suffixes. Two things deserve special notice. One is that the examples are intended to provide a course for classes in which the bookwork is supplied by the teacher. The other is that the collection has been made by a master in a public school, who is clearly in sympathy with the new programme. If only the universities and examining boards can be converted, there is substantial hope for real improvement.

The First Principles of Ratio and Proportion and their application to Geometry. By H. W. Croome Smith, B.A. iv. + 32 pp. (Macmillan.) 1s.—This is intended for school teaching, and does not profess to supply a rigorous theory of proportion. The author starts with the notion of a varying concrete magnitude; then proceeds to define what is meant by one quantity varying directly as another; and thence defines the proportion $A : B :: a : b$. As a provisional treatment of the subject, this is perhaps as clear and simple as any other; as might be expected, the author tends to become obscure in the treatment of the

numerical conception of ratios. The introduction is followed by fourteen theorems and seven problems, which include all the elementary propositions of importance. There are no exercises.

Miscellaneous.

Encyclopædia Britannica. The fourth of the new volumes, being vol. xxviii. of the complete work. Ele-Gla. xix. +742 pp. (Black and *The Times*.)—The fourth of the new volumes of the "Encyclopædia Britannica" maintains the high excellence of its predecessors. Among the numerous articles it contains there are many of exceptional interest to teachers, prominent among which are the articles on geographical subjects. Dr. Hugh Robert Mill contributes the essay on "Geography," in which he gives the history of the subject as well as explaining its principles. Dr. Mill also writes the geographical part of the article on England and Wales, the statistical portion being by Mr. Renwick. Mr. Chisholm is responsible for the geography and statistics of "Europe." Prince Kropotkin writes on "Finland," the Hon. Samuel Pasco on "Florida," and the Hon. Clark Howell on "Georgia." The geography of Germany was entrusted to Prof. Herman Wagner, while Mr. Headlam has written the history of the same country. "English History, 1837-1901," is contributed by Sir Spencer Walpole, K.C.B. Among the numerous scientific subjects are "Electric Conduction" by Prof. Fleming, "Electric Discharge" and "Electric Waves" by Prof. J. J. Thomson, "Steam Engines" by Prof. J. A. Ewing, "Fusion" by Prof. Callendar, and "Fungi" by Prof. H. Marshall Ward. The biographies include those of Emerson, Fitzgerald, Flaubert, Forster, Freeman, Froude, Garfield, and Gladstone. There are numerous mathematical articles, mostly of an advanced kind. Sports are represented by the article on "Football," in which Mr. C. W. Alcock writes on "Association" and Mr. C. J. N. Fleming on "Rugby." But the articles named are only a small selection, which serve merely to indicate the varied interest of the contents of the volume; they give no idea of the amount of scholarship here brought together, nor of the editorial care which a casual examination of the pages reveals. No school should be without a copy of the new "Encyclopædia Britannica."

The Mountain Mother: Glensalmond Sermons. By John Huntley Skrine. xi. +167 pp. (Skeffington.) 3s. 6d.—This is another volume of helpful sermons preached to his boys by the Warden of Glensalmond. As readers of Mr. Skrine's books would expect, they are notable for their helpful earnestness and their intimate knowledge of the particular temptations and weaknesses of schoolboys. Such subjects as "Temper," "Cowardice," "Bullying," "Home Letters from School," are treated in the wise, friendly way which is only possible to a man of deep knowledge and wide experience. We heartily commend the addresses to the attention of all schoolmasters and of schoolmistresses too, for, after all, the moral shortcomings of girls are very like those of boys.

The Little Ones' Library. Illustrated in colours. (1) *A Child's Æsop*, by Alton Towers; (2) *The Good Girls' and Bad Boys' Alphabet*, by Ralph Somerville; (3) *The Adventures of a Monkey on a Stick*, by Langdon Hill; (4) *The Story of a Little Coloured Coon*, by Conrad Hall. (Hodder and Stoughton.) 1s. 6d. each.—Many young children will be delighted with the quaint ideas and pictures in these little books. The books have evidently been written by authors (or an author) fond of children and familiar with their ways of looking at things. The fun will appeal to their sense of the humorous, and the adventures will be followed with keen interest. The coloured illustrations are apt, expressive, and exceptionally clear.

Messrs. Cassell and Co. send us three sets of outline brush-work sheets, *Wild Flowers*, *Pictures wanting Words*, and

Entertaining Pictures, price 3d. net each set. The illustrations to be coloured are in most instances interesting and attractive, and the novel feature of the series is that each sheet is provided with a set of six water-colours, thus enabling the juvenile painter to dispense with a paint box.

CORRESPONDENCE.

The Editors do not hold themselves responsible for the opinions expressed in letters which appear in these columns. As a rule, a letter criticising any article or review printed in THE SCHOOL WORLD will be submitted to the contributor before publication, so that the criticism and reply may appear together.

Surface of a Sphere.

IN the correspondence columns of your issues for November and December, 1901, practical methods for arriving at the surface area of a sphere were discussed. One of the experiments there described, that, namely, of stripping a tennis ball, is well known to teachers of the subject. The other plan recommended, of coating the sphere with oil, determining the increase in weight of the sphere, and comparing this increase with that obtained by treating in a similar way a cylinder, of equal diameter and of a height equal to the diameter of the sphere, is unsatisfactory, owing to the soaking of the oil into the wood of which the solids are made.

Following out a suggestion made to me by Mr. T. Crook, of the Royal College of Science, Dublin, I have recently had made by Messrs. J. J. Griffin and Sons, Limited, Sardinia Street, Lincoln's Inn Fields, W.C., some hemispherical shells of sheet brass, and also circular discs, of the same diameter as the sphere, from sheet brass of the same thickness. It has been found that if these spheres are fairly large, say three inches in diameter, they weigh within a fair degree of accuracy four times as much as the disc. Here are two results:—

(i.) Disc 22.1 grams; two spun hemispheres same diameter as disc 88.8 grams.

(ii.) Disc 22.1 grams; two spun hemispheres same diameter as disc 87.5 grams.

Spinnings of about an inch in diameter are not at all satisfactory. Messrs. Griffin tell me they can supply teachers with sets of three inches diameter, of the above degree of accuracy, for 3s.

A. T. SIMMONS.

Teaching of Experimental Geometry.

IN the October number of THE SCHOOL WORLD two suggested schedules of experimental geometry are published. The two schemes are, I presume, not intended for quite the same class of pupils, but there is very little, if anything, to indicate either the age at which the course should be taken or the exact object of the course.

Professor Perry appears to be considering the case of students who have been taught on what he probably considers an unsatisfactory system, but which has nevertheless given them some reasoning power. I should like to suggest that a scheme of experimental geometry be made out which would satisfy the following conditions:

(a) The total cost of the apparatus used not to exceed two shillings per head.

(b) The scheme to be divided so as to show clearly (1) what ought to be attempted in the two years before commencing a formal study of Euclid; (2) the experimental work which should accompany the separate books of Euclid as they are read.

Mr. Eggar's scheme would meet the case to some extent, but it does not seem to me either sufficiently extensive or sufficiently

definite, and the cost of the apparatus, which appears a small item in a rich public school, may elsewhere present serious difficulties.

There is, I believe, a large class of schools where an hour a week would be available for two years, followed by two hours a week after the study of Euclid had commenced (the two hours including both the Euclid and the experimental work). In addition to this, in many cases, part of the time devoted to geometrical drawing ought to be counted.

I should be glad to hear of such a complete scheme made out by someone who has had actual experience of teaching in the class of school referred to.

Loughborough.

C. H. BLOMFIELD.

The Art of Reading.

IN response to Mr. Renton's request in your November number, I enclose a list of books suitable for boys and girls between the ages of nine and fourteen years. I know from experience that most of these are read with keen delight even by somewhat older children. Mr. Renton may be glad to hear that there is an association called the "National Home Reading Union," formed expressly for assisting readers in the choice of books. Particulars of this can be obtained from Miss Mondy (Secretary N.H.R.U.), Surrey House, Victoria Embankment, London.

The "Young People's" section of the N.H.R.U. is very suitable for boys and girls between the ages of fourteen and eighteen years. Mr. Renton remarks that schoolmasters and schoolmistresses do nothing to help parents in this respect. Believing that the development of a love of good literature should be one of the chief aims of a teacher, I have endeavoured on several occasions to form a reading circle for girls leaving school, and my chief opponents have generally been the *parents themselves*, who have met me with the argument that the girls were already too fond of reading. If parents who desire assistance in this matter would appeal to the teachers, I am sure they would be only too glad to give any assistance in their power. I trust that the enclosed lists of books may prove of use.

MAUDE WRIGHTSON.

Middleton, Lancashire.

November 10th, 1902.

LIST OF BOOKS (9 to 14 years).—Lamb's "Tales from Shakespeare," Tales from the "Faërie Queene,"* Spenser, Kingsley's "Water-Babies," Ruskin's "King of the Golden River," Hawthorne's "Tanglewood Tales," "Stories from the Northern Sagas,"* "Adventures of Ulysses,"* Kingsley's "Heroes," "Junior Temple Reader."*

[Books marked * are published by the Norland Press, Shaldon, South Devon. The "Junior Temple Reader" is a perfect treasure-house for children, although published as a school book.]

The Study of Modern Languages.

MY friend Mr. V. Payen-Payne asks in the November number of THE SCHOOL WORLD: Was it not the great Napoleon who said that he who knew two languages was thereby twice a man? This is incorrect. Charles V. said: "He who knows four languages is worth four men."

O. BAUMANN.

The Ruskin Memorial Scheme.

THE Ruskin Society of Birmingham has existed for some seven years to do honour to the great teacher whose name it bears. It has endeavoured to promote the study of his works and make them a real power in the land, and it has sought to draw together men of all parties and creeds, the bond of union

being the common desire to share the spiritual impetus arising from the study of the works of one who preached a true philosophy, and the recognition that his profound genius was wholly used for the benefit of mankind.

But since the death of Mr. Ruskin the Society decided to be no longer content to exist as an academic body only; and they thought that the best memorial they could raise in Mr. Ruskin's honour was to carry out a practical scheme on the lines and in the spirit of his teaching.

It was not difficult to choose such a scheme. The master's love for country life is known to his most casual reader, as also are his magnificent experiments to foster it; and the advice which in his later years he gave to those who sought his guidance as to practical work was to found a village institute to promote the higher life of the community around it.

The Society resolved to act on this advice, and they believed that in the district of Bournville, if they could secure the necessary facilities, they had a most suitable place for their experiment; for here some of those social reforms, notably the housing one, about which (to quote Mr. Frederic Harrison) Mr. Ruskin had written long years before the statutes, conferences, and royal commissions of our own generation had been carried out. They, therefore, ventured to approach the trustees of the Bournville Village Trust and sought their co-operation. With great generosity the trustees offered to present for the purposes of the memorial a site of upwards of two-and-a-half acres. Here we are building the memorial, of which Lord Avebury laid the foundation stone of the first portion on October 21st last. That portion will embrace a library, museum and lecture room, and rooms for classes in arts and crafts.

The site is a central one, not only for residents here, but for a group of thickly populated villages around. We seek to make the memorial building a centre of effort for the betterment of the conditions of village life and to bring to bear upon that life some of those influences which have now to be sought for in our large cities.

For the completion of our present scheme we require a further sum of upwards of £3,000, and we most earnestly appeal to your readers for their assistance. We shall welcome all letters of enquiry and shall be pleased to give any further information.

J. H. WHITEHOUSE,

Hon. Sec.

Bournville, Birmingham,

November, 1902.

The School World.

A Monthly Magazine of Educational Work and Progress.

EDITORIAL AND PUBLISHING OFFICES,
ST. MARTIN'S STREET, LONDON, W.C.

Contributions and General Correspondence should be sent to the Editors.

Business Letters and Advertisements should be addressed to the Publishers.

THE SCHOOL WORLD is published a few days before the beginning of each month. The price of a single copy is sixpence. Annual subscription, including postage, eight shillings.

The Editors will be glad to consider suitable articles, which, if not accepted, will be returned when the postage is prepaid.

All contributions must be accompanied by the name and address of the author, though not necessarily for publication.

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