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G. STANLEY HALL

President of Clark University and Professor of Psychology and Education

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No. 1

THE VITAL INDEX IN DEVELOPMENT

By BURCHARD W. DE BUSK, University of Oregon

There is perhaps no more important problem for education than that of the physiological development of children during the school age. It would seem that the rate of growth sets a limit to learning beyond which the skill of the teacher can not go. For since the work of Porter (20) there has been good reason to believe that learning is not only conditioned by growth but that in these earlier years the rate of physiological maturing and that of mental development are closely related. Not only this early study but the later work of Smedley (24), Crampton (7), Goddard (13), Arnold (1) and others show that physical and mental retardation go together. The work of Gilbert (12) on the other hand would indicate that the reverse is true. Whether or not these differences in conclusions are due to technique and methods of classification is still a problem. It would seem that there ought to be a close agreement between the grade position of a pupil and the teacher's estimate of his ability, yet the conclusions of investigators using these two methods of classification are not in agreement.

A preliminary investigation of the writer (9) using the grade age method of classification agreed in the main with the conclusions of Porter (20) and Smedley (24). It was noticed in this study that the vital indices of those children below grade averaged much lower than that of those above grade. A study was accordingly begun using the mental age as the basis of classification. It was hoped if a satisfactory method were employed which would select out the mentally

retarded and accelerated that a comparison of the anthropometric measurements of the two groups would reveal some fundamental difference. The two hundred children of the Colorado Teachers' College, one hundred and four boys and ninety-six girls were selected for the study. The number is small but the growth curve of the individual is very similar to that of the group. And the small number enabled one to keep sight of the individual in the group.

The following data were secured, the name, age, physiological age from the teeth, the mental age, grade, height, weight, vital capacity, condition of the teeth and of the tonsils, and the presence or absence of nasal obstruction. To these were added from the records of the school the results of the eye and ear examinations made by Dr. J. D. Heilman of the department of psychology. The height and weight were measured by scales and stadiometer in use in the clinical department. A wet spirometer was used to determine the vital capacity. For this measurement the children were taken in groups and the element of competition introduced into the test. Each child was permitted a number of trials and the best record taken. It may be stated here that the children had had frequent experience with the spirometer. From the above the relation of weight to height was determined, believing that this index would express the general state of nutrition of the individual. The vital indices were also computed. It will be remembered that this index marked the greatest difference between the accelerated and the retarded groups in the preliminary investigation. The classification into the three groups, the accelerated, the normal and the retarded, was based upon the 1911 revision of the Binet scale. The averages are given in the tables.

Historical. In 1889 Gratsianoff (14) in Russia, measured the children of Arznus and brought out the fact that the successful children were larger than the unsuccessful and that their rate of growth was quicker. Sack (23) rejected this because of the small number but his own investigation confirmed Gratsianoff's (14) results. These studies were unknown to Dr. W. T. Porter (20) when he began his work in St. Louis, which was undertaken to find the laws of growth, in order that the school work might be fitted to the ability of the pupil. The method of classification was that of the grade age. Porter raised three questions all of which he answered in the affirmative. Are dull children weaker if size is to be taken as the index of strength? Is mediocrity associated with mediocrity of physique? Is there a physical basis of precocity? Bright children were found to be taller and heavier

than dull. Successful children were also found to have larger chests than the unsuccessful. These facts led Porter to conclude that,

"No child whose weight is below the average of its age should be permitted to enter a grade beyond the average of its age except after such a physical examination as shall make it probable that the child's strength shall be equal to the task."

In November of the same year J. Allen Gilbert (12) of Yale published his *Researches on the Mental and Physical Development of School Children* for the purpose of determining the correlation between the physical and mental development. He classified pupils on a basis of the teacher's estimate as bright, average and dull. He writes in regard to the results:

"The statement is made by Porter that the brighter the child the taller he is. Brightness and dullness in his tests were decided by the examination grades, which it is needless to say are often very poor mental tests. In my results no such relation could be traced."

The same negative conclusion was drawn in regard to weight. The correlation between vital capacity and mental ability was also indifferent and limited. In his Iowa studies of 1897 the same negative conclusions were reached. If anything positive can be stated, Gilbert thinks, it is that the heavier and taller children are the duller.

G. M. West (26) from his study of school children of Canada found as a general rule that the poor, that is the dull children, were more fully developed than the good. In fact the poor were the better developed throughout except girls at fourteen and boys at thirteen. For this reason he considered it safe to conclude that precocity bore an inverse ratio to bodily development.

Smedley (24) reinvestigated the conclusions of Porter using the anthropometric measurements of the school children of Chicago. It is clear from his data that the children who have made the greater intellectual advancement are on the whole taller, heavier and have the greater vital capacity. He found that the pupils of the John Worthy school for truants and incorrigibles were inferior in all the principal measurements taken and that the inferiority increased with age.

Kline (16) found in his study of truants that the mean height, weight and chest circumference was less than the corresponding measurements of public school boys in every instance except the age of ten, when they were equal in height and weight.

Believing that the correlations of Porter were essentially

correct, Goddard (13) compared the growth in height and weight of feeble-minded children with the normal. He found that for boys the feeble-minded were shorter and weighed less, age for age, than the normal. For the girls the situation with regard to height was much the same. For weight the girls seemed to deviate less from the normal than the boys. Having established the above Goddard turned his attention to the difference in the different grades of defect. He concludes that it is evident that the mental condition is correlated with the physical. The idiot he finds to be inferior to the imbecile physically. Size and efficiency go together in the long run. The cause that has acted to impair mind and brain has affected the entire growth process.

As the result of an extended study of physical growth and school progress, based on consecutive measurements at yearly and half yearly periods Baldwin comes to the conclusion that "If pedagogical age be accepted as a fair equivalent to mental development, the tall heavy boys and girls with good lung capacity are older physiologically and are further along in their stages of growth toward mental maturity as evidenced by school progress than are the short, light boys and girls."

On the other hand Wiazemsky (27a) concluded from a study of factors that influence growth that the less endowed surpass the more intelligent in their physical development. This is true especially for the beginning and the end of the period studied by him, that is, from ten to twenty years. The recent study of Arnold on Weight and School Progress brings out again the fact that the heavier children of a given age are to be found in the more advanced grades. His results are confirmed by the results of Hogue, whose tables are reprinted by him.

Historical Summary. Porter and Smedley in the United States conclude that the bright children are taller and heavier than the dull. These results are based on the age grade method of classification. Arnold and Hogue confirm the weight results. Baldwin using school marks comes to the same conclusion. On the other hand Gilbert found no constant relation and West a negative one. Both these investigators used the teachers' estimate of ability as the basis of classification. MacDonald, however, using the same method, confirmed the results of Porter and Smedley. Using spirometry Smedley found that successful children had larger vital capacity than unsuccessful. Gilbert found that correlation to be indifferent or negative, except that from ten to fifteen the dull children have the larger capacities. The investigation of Baldwin and the preliminary study of the writer confirmed Smedley's re-

sults. Wiazemsky measured the chest circumference and found good pupils to be superior at all ages except from twelve to thirteen and from fourteen to fifteen.

Height. Height is the most distinctly human of all the measurements, representing as it does a definite racial characteristic. Heredity preserves a definite norm which all its members tend to attain within rather narrow limits. So having the norm for the different ages established, height gives a fair index of the development of the individual. Bowditch pointed out that the taller individuals, that is, those in advance of the norm for their age reached the rapid growth period earlier. This fact has again been brought out recently by Baldwin. These taller boys and girls he says are the physiologically accelerated boys and girls. They complete their elementary school course earlier, he continues, and as a rule make higher grades than the shorter boys and girls whom he regards as physiologically retarded. If this finding holds as it certainly does for relatively large numbers then height in relation to the norm of a given age is a criterion of physiological age and these taller boys and girls have attained a greater proportion of their mature height. Growth in height is rapid in early childhood and falls to a minimum about ten or eleven. This period of retardation is followed by one of acceleration beginning with pubescence. Acceleration alternating with retardation is a general law of growth, true of the individual as well as of the group. Every study since Quetelet has shown the period of retardation from eight or nine to ten or eleven, followed by a period of acceleration lasting about four years. With girls this period of acceleration begins a year or two earlier than with boys and accounts for the fact that from eleven to fifteen in general, girls are taller than boys. Thus the data presented in this study are typical. But not only are the girls taller during pubescence but also at seven and nine, a fact which may be due to some accident of numbers or may show some variation of growth since the same fact is noted in the results of several investigators. As mentioned before, the pubescent crossing of the curve is due to the earlier rapid growth of the girl. Some investigators think that the comparison should not be one of attainment at a given chronological age but rather should be between the percentages of adult height attained at a given age.

Let us turn now to the analysis of the data on the basis of mental age. The accelerated boys are taller than the normal till twelve. At this age and all succeeding ages studied they are not so tall. On the other hand the retarded are

shorter than the normal at all ages studied except eight and thirteen, when they are also taller than the accelerated. Thus the accelerated are taller than the retarded at all ages except eight and thirteen. If we compare the accelerated and the retarded girls the former are taller until the rapid growth period begins at eleven. At this age they are surpassed by the retarded who remain taller until fourteen. The delayed growth of the retarded girl in the earlier years seems to be compensated for by the three years of rapid growth from eleven to thirteen inclusive. Thus we find retarded boys to be taller at thirteen and girls at eleven, twelve and thirteen. This conclusion is not in accord with Wiazemsky who found good pupils to be superior in height only during the period of rapid growth. The periodicity of growth is much more marked in the retarded than in either the accelerated or the normal. With the latter, growth is much more steady and uniform. With the retarded the earlier years mark a period of very little growth. This is followed by a period of acceleration perhaps shortened in time but compensated for by intensity. Some investigators think that this rapid growth can have only a harmful effect on the individual from the standpoint of the physical and the mental life. As to the cause of the extreme periodicity of growth we can not say. Some investigations indicate that this picture is usually accompanied by effects which follow harmful conditions, namely the precipitate growth and the delay of puberty. (See Table I.)

Weight. Unlike height, which when once gained cannot be lost, weight varies greatly, is easily lost and gained. It is an experimental datum as Montessori (19) calls it, a barometer, an index of the child's health deserving of the most careful study. Environmental factors as illustrated in McKenzie's studies, deprivation, fatigue, anxiety, worry, malnutrition, illness, all affect adversely the weight of the child. A careful study of the weight may not only reveal the effect of factors in the environment but may serve to reveal the strength or weakness of the child's organs.

As with height, growth in weight is not uniform but rhythmic. There is in general a slight acceleration in girls at seven and in boys at eight. The following period of retardation in growth reaches its lowest with girls at nine and with boys at eleven. At about eleven the period of rapid acceleration of weight begins and lasts about four years. In the present study the growth in weight follows the usual course. There is little difference between the sexes until twelve. Girls are slightly superior at seven and nine. The pubertal superiority begins at twelve. As with height this

superiority is due to the fact that the rapid growth period begins earlier with girls than with boys. The accelerated boys weigh less than the normal boys except at the ages seven, twelve and thirteen. Retarded boys are heavier than the normal at eight, twelve and thirteen. When compared with the accelerated the retarded are heavier at the ages of eight and thirteen.

With girls the accelerated are lighter than the normal at all ages except thirteen and fourteen. Retarded girls are lighter than the normal until eleven, then heavier except at thirteen and fourteen. Retarded girls are lighter than the accelerated at eight but heavier in all other groups presented. While retarded boys are lighter than the accelerated at almost all ages, retarded girls are heavier at ten and subsequent ages.

The gain in weight is not so uniform as the gain in height probably for the reasons mentioned in a preceding section. Nevertheless accelerated and normal show a rather uniform rate of growth until the rapid gain at puberty. With the retarded we have the law of compensation at work as in height. The rapid growth of puberty tends to bring both retarded boys and girls above the accelerated at this period, boys at thirteen and girls from eleven on. (See Table II.)

Vital Capacity. The development of the chest is of the greatest importance. No part of the body undergoes greater changes. Hastings speaks of the want of breadth in the infant chest. Woods Hutchinson writes of the widening of the chest in the animal series. The human chest is almost unique, he writes, in that its transverse diameter is the greater. This transformation from the narrow almost animal form to the more human adult form is destined to receive greater consideration in the future than it has in the past. The rate of transformation will give us another index of the rate of the maturing of the individual.

The circumference of the chest has received considerable attention especially in its relation to height. The general rule is that the chest circumference should equal half the total stature. This has been one of the determining marks for military fitness. It is generally conceded that the more the chest circumference exceeds half the height the greater is the vitality and the greater the ease with which the individual adjusts to the varying effects of the environment. The measurement of the chest must of necessity give some idea of the development of the lungs. These are the organs that furnish the means for the inter-communication between the blood and the oxygen which is so essential not only for all growth but for all functioning as well. The lungs are responsible for

oxygenating the tissues of the body and in this way aid in cellular metabolism. If the lungs are relatively small then the body is without that factor of safety, metabolism is probably slowed down and the amount of exertion under stress is limited. A large supply of oxygen stimulates interchange. The want of it reduces activity. For the growing person the rate of approach to maturity, the physiological age, is retarded. Two methods of measuring have been used by students of the mental and physical growth of school children, the chest circumference and spirometry or the measurement of vital capacity. Porter studied the girth of the chest of the school children of St. Louis and found that the bright children have a larger chest circumference than the dull. The results of Gratsianoff and Sach agree with Porter in this respect. Kline found the chest girth of truants to be less than that of public school children at all ages except at ten. Wiazemsky found good children, that is the bright, to be superior to the poor at all ages except twelve to thirteen and fourteen to fifteen. He also found that robust children were superior at all ages. Also those of good conduct were superior to those of bad at all ages except thirteen to fourteen and sixteen to seventeen. Not only did Wiazemsky point out the above but also the significant fact that the occupation reflects itself in the development of the chest. From the above it is safe to conclude that there is a correlation between school progress and chest circumference.

While there must, it seems, be a high correlation between chest capacity as shown by chest circumference and vital capacity the two are not synonymous. Other investigators have used spirometry. Spirometry only measures directly the respiratory capacity and indirectly the pulmonary capacity. Gilbert found that there was no constant relationship between mental ability and vital capacity until ten to fifteen when the duller children had the larger capacity. Smedley in his investigation found that the vital capacity was much greater in the children of higher school standing. Goddard has pointed out that the vital capacity of feeble-minded children is smaller than that of the normal. Montessori states that among children that are recognized as the brightest she has been able to recognize two categories, those who are exceptionally intelligent and those who are exceptionally studious. The former have better chest development than the latter.

In general vital capacity in its growth follows the same laws as weight, showing the same periods of retardation and acceleration. Practically all investigators have found that boys have larger vital capacities at all ages than girls. Bald-

win's study shows girls with greater vital capacity between thirteen and fourteen. The present study would add also the ages of seven and nine. On the basis of mental age the accelerated boys have better vital capacity than normal at all ages except eight and fourteen. The retarded are inferior to the normal except at eight, when they are equal, and at twelve. At no age do the retarded show a vital capacity equal to the accelerated except at eight. Accelerated girls are superior to normal at all ages except seven and twelve. The retarded are superior to the normal at thirteen and fourteen. At thirteen the retarded are superior to the normal but at no other age.

Thus accelerated boys have greater vital capacity than retarded at all ages except that of eight, when they are equal, and the same general rule is true of girls except for the age of thirteen. Again the same tendency toward a uniformity of growth is noticed for the accelerated and the normal. Also the same period of retardation in the earlier school years, followed by rapid growth, which is more marked with the retarded girls than with the boys. (See Table III.)

Growth, which is an exceedingly complex process, manifests itself in three laws studied by many investigators but especially discussed by Wiazemsky. First is the law of periodicity. According to this law, the growth of the organism is subject to accelerations and retardations. While this law is seen to an extent in all the groups studied it is much more noticeable in the retarded. It would seem that during the earlier school years some factor, or perhaps several is at work which tends to slow down the growth process. Baldwin, studying the taller and heavier children as a group found that the period of acceleration and arrest began and ended earlier with them than among those below the median height and weight. Then when development is arrested at any of its regular growth periods by unfavorable circumstances, there is a tendency for a later rapid growth to compensate for lost time. The brevity of the period of retardation is compensated for by the extent of growth and vice versa the slowness of the growth rate by the length of time. In the third place there is the law of correlation. The human body is wonderfully complex. If it is to grow and function properly there must be a proper correlation of its parts. The digestive system must be equal to the task of furnishing an adequate amount of nutritive material. The lungs must be large enough to supply not only the average need but also a factor of safety for the moments of intense effort. The heart and the arteries are responsible for conveying a sufficient amount of material to the growing

and functioning parts. Unless such a correlation exists growth can not be equal and uniform. Some parts must grow at the expense of others. Protective measures for the preserving of energy must arise. On this point in the absence of further investigation we can not speak. As the matter now stands, the brighter children are those who seem to have this balance or even an excess on the side of vital capacity. The other systems mentioned have not been studied in this connection.

On the basis of mental age, accelerated boys are as a rule taller and heavier and have larger vital capacities than the retarded, while with the girls studied the retarded excel in height and weight during the rapid growth period and also in vital capacity at the age of thirteen. This of necessity means that there are many groups of accelerated that are below the average of their age in the measurements mentioned. This was recognized by Porter and the investigators following him. It was pointed out by these that the small accelerated were taller and heavier than the small retarded.

If height and weight are to be considered as expressions of physiological age as many think, and the writer believes that this is true of the average, then it would seem that children must be differentiated into types. Then as a rule the taller and heavier for the type would be physiologically the more mature. But it is yet a question whether or not this would solve the problem. For one would have yet in classifying a child to determine whether it was a case of type or physiological retardation, in which case the height and weight would be the result of some unfavorable factor acting upon the growth process. Is there not some underlying principle which will harmonize the conflicting data? Not only the energy of growth but the energy of work hangs on the metabolic balance. With the production of work there must be consumption of fuel either of food or of body material. In work of course this consumption is greatly in excess over rest. Probably in no organ is the demand for quick change so great as in the brain. There is growing evidence that the oxygen consumption of the brain is greater than previously thought and it has already been shown that there is a direct relation between the rate of recovery from fatigue and the rate of transmission of the nerve current. In view of these facts it seems reasonable that Whipple's statement of the vital index is correct, that the vital index, the ratio of vital capacity to weight "expresses the balance between body size and the rate and completeness with which oxidation of the blood is or may be affected."

The vital index should it seems give a rough measure of the endurance of the subject and of his recuperative powers. The subject with the higher vital index would then do the greater amount of work. It was shown by illustration in the preliminary work that those children of a given age who were the farther advanced had the higher vital indices.

Kotelman in 1878 was the first to study lung capacity in relation to weight and pointed out the fact that lung capacity increased slightly faster than weight. This conclusion was confirmed by Vierordt. Bobbett in 1909 studied the vital index of Philippine children. Since then Pyle (22) has figured the vital index for Smedley's data showing that the vital index for boys is almost constant at 25 cc. per pound of weight and for girls 23 cc. until eleven. There is then a gradual decrease until fourteen. At this age the index is 21 cc. Baldwin also gives the vital index in his studies of growth.

Our method of classification permits the study of the vital indices of the different groups. At the ages of seven and nine the vital indices of boys and girls are practically the same. At all other ages boys have the higher vital indices. Compared with Smedley's data the vital index of the boy throughout is about the same. The girls do not show the progressive drop after the age of eleven. At the age of eight in our table the average vital index of the accelerated boy is slightly lower than that of the normal. But at no age is the vital index of the retarded as high as that of the accelerated. Consequently there is a marked difference between the vital indices of the accelerated and the retarded boys. With the accelerated girls the vital index is higher at all ages than that of the retarded. However at ten the retarded slightly surpass the normal. But as with boys there is a marked difference between accelerated girls and the retarded. Regardless of age the accelerated show a relatively high vital index while the retarded are relatively low. (See Table IV.)

There is undoubtedly a high correlation between the results of the Binet scale and the teacher's estimate, also between the teacher's estimate and the grade position. So classification on these bases should show the same differences in vital indices although not so great. For the purpose of determining, the vital indices were figured for the work of Gilbert at Yale and the study of Smedley. With Gilbert's study the bright, on the basis of the teachers' estimate, show the higher vital indices at all ages except those of eleven and twelve. The Iowa study does not give as high a correlation. Of the total number of ages studied by Gilbert at Iowa the dull show the lower vital indices in eight and the higher in the remaining

four. Smedley classified the Chicago children into two groups on the basis of the grade age position as follows, those at and above grade and those below grade. The at and above grade group shows the higher vital index at every age except eight and ten. It is to be expected that the difference will be greater in the upper grade, where there is a greater accumulation of retarded on this method of classification. The below grade girls have the higher indices at ten and eleven and are equal to the at and above grade group at thirteen. When compared with the at and above grade boys, the boys from the John Worthy school for truants show lower vital indices except at the ages of nine and twelve. (See Table IV.)

From the above comparisons, in spite of differences of classification, technique, etc., one fact stands out and that is that accelerated children, regardless of the method of classification, show at almost every age the higher vital indices. We believe that the vital index is much more closely correlated with acceleration and retardation than height, weight or vital capacity, and that it is a measure which will harmonize the otherwise conflicting data.

Is there any relation between a high or a low vital index and the development of the child? If it is shown that a relation exists, then the problem becomes an important one for education and hygiene. The vital index can be increased by training which decreases surplus weight and increases the vital capacity. This increase means a better aeration of the blood and, it would seem, an increase in metabolism which would show in endurance and resistance to fatigue or, in other words, in a greater output of work.

It will be objected that spirometry is not altogether a measure of vital capacity. This objection is not without foundation but we believe that the evidence at present shows or at least indicates strongly that the retarded children have smaller chests and presumably smaller lungs due, we believe, to a physiological retardation. It was shown by Porter that those children who were below grade had the smaller chests.

While the measurements of height, weight and vital capacity are of undoubted value they do not give a complete picture of child development. Growth is more than an addition of mass or stature. At birth the child is quite different from the adult in its body proportions. Its growth is an ontogenetic development passing from the form and proportion of the infant to that of puberty and then on to that of the adult. This ontogenetic development can best be traced by the indices of growth, that is, by the relation of weight to height, the height-weight index, by the ratio of sitting to

standing height and by the ratio of chest circumference to height. Not having in mind at the time of collecting the above data the question raised above, the measurements for tracing all these changes were not made, nor is there any single study which enables one to trace all these changes in the same group. However, data of those investigations in which the vital index differences have been shown give some idea of the relationships which we are seeking to establish.

The height-weight index "expresses the comparative solidity or robustness of the individual and other things being equal his general nutrition. There have been two methods of obtaining the height-weight index. The division of the weight by the height gives the proportion of mass for a given unit of height. The most important conclusion on the basis of this method is that the weight increases somewhat faster than the height. This method is held to be faulty by many because it is a comparison of a linear measure with a volume and the resulting indices do not show the transformations of the body as it approaches maturity. It is a matter of common observation that young children have a relatively large proportion of weight for their height, that is, are, as we say, plump. They become thinner before puberty and heavier afterwards. The above method does not bring out this fact. The method used in this connection is expressed by the following formula. The height-weight index equals one hundred times the cube root of the weight divided by the stature. There is a gradual decrease in the indices until just before puberty. From this time until about the age of seventeen the index remains rather constant and then begins to rise as the individual takes on weight, following the pubertal transition. An important study cited by Montessori brings out the fact that the height-weight index of the studious is lower than that for the non-studious. Also that the index is higher for the feeble-minded than for the normal. Consequently she thinks that the sole cause of the physical inferiority of studious children is cerebral fatigue.

Calculating for our own groups and also for Smedley and for Gilbert, the height-weight indices bring out the fact that there is a tendency for the retarded to show the higher indices. (See Table V.)

The second important index is that of the relation of sitting to standing height. This ratio may very well represent the physiological efficiency of the individual. In fact, Collignon spoke of it as the essential stature. This index also enables us to trace the rate of development of the growing child. In early childhood there is an exaggerated trunk length. The

vegetative life is then the most important. With growth this excess gradually decreases until it is least at puberty, following which there is a gradual increase in the excess of trunk length, a return as it were to the more childlike proportion. Thus growth in height until puberty is mainly due to growth of the long bones of the legs. As Godin pointed out, at puberty the lower limbs have a greater dimension in proportion to total height than at any other time. After puberty the proportion of the trunk for boys increases until about seventeen, after which the individual may grow in height but the proportion remains rather constant. With girls the proportion of the trunk continues to increase after this age.

The deviation from the norm of a given age represents in the growing child either a retarded or an accelerated development; and in connection with the other indices gives us a measure of the rate of approach to maturity.

A study of the Smedley groups not only bears out this generalization but shows a close relation between the rate of development and the vital index. Those with the higher, show the more rapid transformation, while the below grade are the retarded and show the lower vital indices. These differences are seen when we compare the retarded and the accelerated girls also with the two groups of the boys and again when we compared the at and above grade boys and the boys from the John Worthy School. (See Table VI.)

We do not have the data to show the relation existing between the ratio of chest circumference on the one hand and the vital index on the other. However retarded children have a smaller chest circumference than accelerated as was shown by Porter. There is a need of study of all of these relationships in the same group of children.

While no thoroughgoing conclusion can be drawn, yet as a general rule accelerated boys are taller, weigh more and have the greater vital capacity. Accelerated girls have the greater vital capacity but the retarded are taller and heavier during the greater part of the rapid growth period. With both the boys and girls the vital index of the accelerated is greater at all ages than that of the retarded. With weight the reverse is true. The retarded show a greater proportion of weight per unit of height than do the accelerated. There are, however, exceptions to this rule, but the general tendency seems to be for the accelerated to show the lower proportion of mass with the higher vital index, as it were a relatively low mass highly oxygenated. The opposite holds for the retarded. The study of the ratio of sitting to standing height brings out the fact that those children with the higher vital

indices are approaching maturity in advance of the low vital index groups, that is, are relatively more mature for the same chronological age.

Those children of a given chronological age who have the higher vital indices are then the more mature and test mentally higher than those with the lower vital indices. Consequently then compulsory school entrance at the age of six must mean that a large number of the entering children are not six physiologically or mentally and so are doomed to failure if the school maintains a fairly uniform standard of work. Many of them after marking time until they are sufficiently mature pass through the remaining grades without difficulty. Again the question is raised whether the two groups described as accelerated and retarded are not after all types in need of radically different treatment. With a classification on the basis of the mental age the physiological differences do not disappear. Although there is little evidence on which to base the opinion, the writer has been unable to escape the conviction that the low vital index group furnishes the majority of those who fail in the lower grades and also of those who are eliminated in the upper grades. This, however, is being made the subject of a separate investigation.

In conclusion the writer wishes to express his appreciation to the members of the staff of the Colorado Teacher's College Training School who made possible the collection of the data of this paper and to express his sincere thanks to President Hall and Dr. Burnham of Clark University, who, for criticism and suggestion, gave so generously of their time.

TABLE I
HEIGHT IN INCHES

Age.....	7	8	9	10	11	12	13	14	15
Boys.....	47.9	51.0	52.0	54.0	56.0	56.4	60.1	60.0	64.3
Girls.....	48.9	50.0	52.8	53.6	55.3	57.5	61.2	61.0	62.8
Boys									
Ac*.....	49.0	50.3	52.0	54.5	56.5	56.3	60.0	60.5	....
Norm.....	46.0	49.8	50.7	53.5	56.1	57.5	60.0	63.4	67.0
Ret.....	....	52.0	....	51.5	52.0	55.5	60.5	58.0	64.0
Girls									
Ac.....	49.0	51.0	51.8	52.5	56.0	56.0	60.3	63.0	....
Norm.....	49.0	50.5	53.5	55.0	54.7	57.8	59.2	59.3	62.0
Ret.....	....	50.3	....	52.5	57.0	57.5	62.8	61.7	64.3

* Ac., Accelerated: Those testing one year and above chronological age. Norm., Normal: Those testing at age. Ret., Retarded: Those testing one year and not more than three below the chronological age.

THE VITAL INDEX IN DEVELOPMENT

TABLE II

WEIGHT IN POUNDS

Age.....	7	8	9	10	11	12	13	14	15
Boys.....	49.8	61.3	60.4	67.8	75.5	81.1	90.6	87.0	116.5
Girls.....	54.7	57.3	63.7	64.3	72.3	79.7	100.1	107.1	113.0
Boys									
Ac.....	51.0	61.0	59.4	69.6	72.6	82.2	91.3	84.5	....
Norm.....	46.5	61.0	61.7	71.5	78.3	77.0	89.0	93.0	137.0
Ret.....	....	65.0	....	59.0	64.0	82.0	94.5	82.3	114.0
Girls									
Ac.....	44.0	58.0	62.5	60.0	70.0	70.0	96.6	101.0	....
Norm.....	60.5	61.5	65.4	68.0	72.0	83.2	85.4	100.0	116.0
Ret.....	....	53.0	....	61.0	76.0	77.8	121.2	112.8	112.0

TABLE III

VITAL CAPACITY IN LITERS

Age.....	7	8	9	10	11	12	13	14	15
Boys.....	1.24	1.53	1.50	1.76	2.01	2.18	2.34	2.15	2.98
Girls.....	1.23	1.30	1.59	1.64	1.77	1.90	2.36	2.35	2.63
Boys									
Ac.....	1.30	1.50	1.60	1.94	2.07	2.60	2.60	2.30	....
Norm.....	1.15	1.55	1.37	1.75	2.02	1.95	2.25	2.36	3.60
Ret.....	....	1.50	....	1.35	1.50	1.75	2.25	2.10	2.91
Girls									
Ac.....	1.20	1.53	1.63	1.80	1.90	1.90	2.47	2.80	....
Norm.....	1.30	1.45	1.57	1.63	1.66	2.40	2.06	2.25	3.00
Ret.....	....	1.00	....	1.50	1.60	1.72	2.65	2.38	2.50

TABLE IV

VITAL INDEX

Age.....	7	8	9	10	11	12	13	14	15
Boys.....	24.9	24.9	24.8	25.9	26.6	26.9	25.8	24.7	25.6
Girls.....	22.5	22.8	24.9	25.5	24.5	23.8	23.6	21.9	23.3
Boys									
Ac.....	25.5	24.6	26.7	27.9	28.5	30.4	28.5	27.2	....
Norm.....	24.7	25.4	22.2	24.6	25.7	25.3	25.3	25.4	26.2
Ret.....	....	23.1	....	22.9	23.4	21.3	23.9	23.5	25.5
Girls									
Ac.....	27.3	26.0	26.2	30.0	27.1	27.1	25.6	27.7	....
Norm.....	21.5	23.6	24.2	23.9	23.1	24.5	24.2	22.5	25.9
Ret.....	....	18.9	....	24.6	21.1	22.1	21.9	21.1	22.3
Smedley Boys									
At and above grade	25.1	25.8	25.0	25.3	25.4	25.5	25.0	26.3	....
Below grade.....	26.3	24.9	25.5	25.0	24.3	25.2	25.0	24.7	....
John Worthy School	....	26.1	25.0	24.4	25.7	24.8	25.1	24.5	....

TABLE IV—Continued

Girls									
At and above grade	23.0	23.3	22.6	22.4	21.8	20.6	20.6	20.6	20.6
Below grade.....	22.7	22.9	23.4	22.5	21.1	20.6	20.3	19.1	
Gilbert—Yale Study									
Bright.....	22.1	21.9	21.8	21.4	21.7	20.8	22.6	19.4	21.8
Dull.....	20.8	20.1	21.1	19.3	21.9	21.7	18.9	17.3	19.9

TABLE V
HEIGHT-WEIGHT INDEX

Boys									
Age.....	7	8	9	10	11	12	13	14	15
Ac.....	22.9	23.9	22.7	22.6	22.3	23.5	22.7	21.8	....
Ret.....	....	23.3	....	22.7	23.3	23.5	22.6	22.7	23.0
Girls									
Ac.....	21.9	22.8	23.0	22.4	22.1	22.1	23.2	22.4	....
Ret.....	....	22.7	....	22.7	22.3	22.9	23.8	23.6	22.7
Smedley Boys									
At and above grade	23.8	23.1	23.2	23.2	23.1	23.0	23.0	23.0	22.9
Below grade.....	23.5	23.5	23.5	23.3	23.3	23.1	22.9	23.2	
John Worthy School	....	23.5	23.9	23.6	23.6	23.5	23.4	23.4	
Girls									
At and above grade	23.4	23.1	23.1	22.8	22.8	22.9	23.1	23.3	
Below grade.....	23.5	23.2	23.4	22.9	22.9	23.0	23.1	23.1	
Gilbert									
Bright.....	23.4	23.0	23.2	22.4	22.8	22.7	22.8	22.1	
Dull.....	23.6	23.3	22.9	21.6	22.8	22.8	22.4	22.8	

TABLE VI

RATIO OF SITTING TO TOTAL STATURE

Smedley Boys									
Age.....	8	9	10	11	12	13	14	15	
At and above grade	54.8	54.0	53.5	53.1	52.5	52.1	52.1	52.0	
Below grade.....	55.1	54.7	53.8	53.3	52.9	52.2	52.2	51.8	
John Worthy School	....	53.7	54.5	53.6	53.4	52.6	52.9	51.0	
Girls									
At and above grade	53.9	54.0	53.5	53.1	52.7	52.6	52.9	53.4	
Below grade.....	55.4	54.3	53.8	53.4	53.1	52.8	52.1	53.1	

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A BRIEF SURVEY OF RIGHT- AND LEFT-HANDEDNESS¹

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Every known language contains terms for right and left, by which it is clearly shown that in all times the idea of "rightness" or dexterity, has greatly outweighed that of "leftness," or awkwardness in value. It is needless to dwell here upon the various superstitions of former times regarding left-handedness. A detailed account of such ideas is set forth by Hertz in his treatise on Religious Polarity, dealing with the traditions of the Maori tribe of New Zealand. Our custom of wearing the engagement and wedding rings on the left hand is traced back to their belief in dispelling all evil influence and temptation connected with it, as the left side is profane, the right, sacred. Daniel Wilson in "The Right Hand: Left-Handedness" also presents many biblical examples of the usage of these two members, all of which are very interesting, though not of scientific value.

As to the origin and practice of right- and left-handedness many conflicting views have been set forth. I shall group these opinions according to the seven following theories:

I. THE HAND AND FOOT THEORY

This theory is upheld by Charles Bell who declares right- and left-handedness to be of the same order as right- and left-footedness. Workman has upset this view by the fact that a "spade foot" is as likely to be left as right in a right-handed person, and vice versa; and that a boy always hops on his "spade foot." I confess I cannot follow either line of argument. A boy is usually over his hopping period before he uses a spade to the extent of habitually guiding it with one foot more than the other. We find it convenient to use both feet whether we are right- or left-handed.

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II. THE HAND AND EYE THEORY

Gould considers that right-handedness originates in right-eyedness. Whichever eye first develops more than the other in strength, governs the hand on that side of the body, thus causing the preferred member. He considers ambidexterity nonsensical, and declares it to be the hobby of fanatics. It would mean playing on two pianos instead of one; fingering on the violin first with one hand, then the other; and would require separate road laws calling for passage to the left one day, and to the right, the next. He excuses the exception of the English road rules on the score of the once filthy streets and poor conditions generally; for as is said of the English custom:

“If you go to the left, you are sure to go right;
If you go to the right, you go wrong.”

He suggests that this extreme awkwardness of the English may account for the many accidents in the navy.

Gould offers as a proof of right-eyedness the right-hand position of the railway engineer. To be sure, the engineer's position is at the right, but does this mean that he makes use merely of his right eye, or that he is concerned with what passes to the right, only? From his seat he has a clear view of the entire track in front of him, and takes his signals from the left as well as from the right. All right-handed engineers are not right-eyed; and neither is the left-handed engineer at a disadvantage as regards his left eye, because he must sit at the right side of the cab.

The driver of a carriage or wagon usually sits on the right half of the seat, perhaps from habit, or more naturally, for convenience if he steps onto the vehicle from the sidewalk, as he does in most cases. If, however, he steps onto his delivery wagon from the left side, he is quite likely to take his position at that end of the seat, or in the centre. Few will take the trouble to pass over to the right, unless from strong force of habit.

The earliest models of the automobile would tend to bear out Gould's theory of right-eyedness as applied to the engineer, since the first drives were all right ones. Supposing such an argument to hold, it would prove that all early models were made exclusively for right-handed people, and that the improved models of to-day are constructed for their left-handed friends. Perhaps Gould would not include the right and left drives of the automobile in his arguments for right- and left-handedness, but it seems in consistency with the subject.

The manufacturers argue not on the basis of eyedness or handedness, but convenience. Road rules call for a right

facing of machines, hence, in order to enter the car from the sidewalk instead of walking around to the opposite side and entering from the oft-times muddy street, the drive must be a left one.

A different phase of this subject is brought to light by Stevens in his papers on Peculiarities of Peripheral Vision. His disc tests prove that an object in the right half of the field of vision appears larger than an exactly similar object occupying a symmetrical position in the left half of the field of vision. This result is, with some exceptions, universal for right-handed observers. He proves the tendency to relationship between right-handedness and the enlargement of the right disc, and left-handedness and the enlargement of the left disc.

Later, Stevens and C. J. Ducasse, in their report on The Retina and Righthandedness, give a summary of the results of their tests as follows:

I. In general it may be said that the right half of an extent in the field of vision is overestimated.

II. This overestimation holds true for both right and left eyes.

III. The extent which is overestimated forms its retinal image upon the left corresponding halves of the two retinas.

IV. The left corresponding halves of the two retinas are connected exclusively with the left hemisphere of the cerebrum.

V. By reason of the fact of a marked difference in the space sense of the two halves of the retina, those objects in the right half of the field of vision, by appearing larger attract the visual attention which in turn leads to grasping movements of the right hand. The hand thus formed by earliest experience acquires a special skill which causes it to be used in all manual acts requiring the greatest precision.

Max Meyer's view is a contradiction of the previous one. He says that left-sidedness of the infant is in every respect of the same nature as right-sidedness of the adult. By "infancy" he means the period preceding speech. If the left cerebral hemisphere, which serves such complex functions as speech, reaches maturity only during the second year, it is safe to say that during the first few months of life hand movements are predominantly controlled by the right brain which serves simpler functions and probably matures at an earlier period. If this is true the attempt of H. C. Stevens to explain right-handedness, fails. Meyer claims that the superiority of the sense of sight on the right half of the field of vision, which Mr. Stevens has proved, is not the cause but

rather the effect of right-handedness, unless both are to be regarded as the effects of a common cause.

According to Meyer, children who in the first stage of life are left-handed, become right-handed when the speech centre becomes active, and vice versa. This implies that the great majority of children during the first year or so are distinctly left-handed, which we know is not the case. He fails to account for infants who are thoroughly left-handed and remain so throughout life.

With a view to discovering whether either right- or left-handedness is due to the predominance of one eye over the other, the following questionnaire was submitted to Perkins Institution and Massachusetts Institution for the Blind, and the New York State School for the Blind:

1. Name and age.
2. Do you write with your right or left hand?
3. Were you taught to use this hand?
4. Do you read with your right or left hand?
5. Were you taught to use this hand?
6. With what hand do you use the following: (a) hammer?
(b) scissors? (c) jackknife? (d) ball-throwing?
7. Were you taught to use this hand? ¹
8. What left-handed relatives do you know about?
9. Were you born blind?
10. If not, at what age did you become so?
11. What was the cause?

* * * * * * * * *

Pupils with deformed or maimed hand or arm are excused from answering these questions.

If the name is withheld, please state sex. ¹

The returns of two hundred pupils show that 10% of the boys and 11% of the girls are natively left-handed; while 5% of the boys and 16% of the girls are of the mixed type, a few being practically ambidextrous. 50% of these pupils were born blind, about 30% became so within the first six months, while those remaining lost their sight, partially or entirely, between six months and eighteen years.

Since many cases of right- and left-handedness are found among those born blind, it would seem that we cannot trace the preference of one hand over the other to any predominant influence of one eye, as Gould believes. The mixed type is found for the most part among those born blind, which shows what non-interference may do. The blind child, if let alone, will use whichever hand is the more natural or convenient in any case; in other words, prejudice of custom plays no part in his hand motion.

Many interesting cases are found in these schools. Two girls read braille with the right hand and line type with the left. One girl who is right-handed in everything else reads with her left hand and keeps place with her right. She was taught the opposite but finds this way more speedy. Another right-handed girl does likewise, not for speed, but because she has better touch in her left hand. A girl who became blind at two months uses her right hand for everything but hammering. She was not taught to use the hammer, which she holds in her left hand. As a hammer is usually held in the stronger hand, this example seems to show selection by nature as opposed to education or training. Two girls who were taught to use the easier hand, read with their left, though the right hand is employed in all other cases. A girl who became blind in early childhood is purely ambidextrous. She uses either hand well in any case. A similar case is found in a partially blind girl. Several of the right-handed boys read with their left hand, or either, immaterially. One throws a ball with his left hand. Five right-handed boys, who were born blind, throw a ball with the left hand. Two of these boys use the left hand in reading. A left-handed boy, who became blind at three years, is right-handed in ball throwing.

Fully one-third of these pupils write back-hand or have a strong back-hand tendency. Among this number are found all cases—left- and right-handed born blind, left- and right-handed becoming so, and the mixed and ambidextrous types.

III. CIRCULATION THEORY

Wilson in summing up the various views of right- and left-handedness, states in brief the following: 1. The general vigor, and immunity from disease appear to be transferred to the left side of left-handed people; and this has naturally suggested the theory of a transposition of the viscera, and the consequent increase of circulation thereby transferred from one side to the other. "This is an untenable theory as the relative position of the heart is easily determined in the living subject."

2. A greater flow of blood to the left side is traced to the reverse development of the greater arteries of the upper limbs. This idea is more generally favored.

Barclay's contention as stated by Buchanan reads: "The veins of the left side of the trunk and of the left inferior extremity cross the aorta to arrive at the vena carva; and some obstruction to the flow of blood must be produced by the pulsation of that artery. All motions produce obstruction of the circulation, and obstruction from this cause must be more

frequently produced in the right side than the left, owing to its being more frequently used. But the venous circulation on the left side is retarded by the pulsation of the aorta, and therefore the more frequent motions of the right side were intended to render the circulation of the two sides uniform."

Wilson considers this a curious idea as it traces right-handedness to the excess of a compensating force for an assumed inferior circulation pertaining naturally to the right side.

Hyrtl thinks that ordinarily the blood is sent into the right subclavian under a greater pressure than into the left on account of the relative position of these vessels; that in consequence of the greater supply of blood, the muscles are better nourished and are stronger; hence the right extremity is more used. In cases of reversed condition, left-handedness is occasioned.

IV. THE WEIGHT AND EQUILIBRIUM THEORY

Buchanan's early theory is based on the preponderance of the liver and lungs on the right side; that the right lung is the larger, having three lobes, whereas the left has only two; that the liver, the heaviest organ of the body, is on the same side; and that the common centre of gravity of the body shifts more or less toward the right. He fails to account for the normal deviation from the natural action of the body.

His modified opinion is a Theory of Equilibrium by which he claims the following variations: (1) The centre of gravity above the transverse axis, with its accompanying right-handedness.

(2) The centre of gravity corresponding with the transverse axis, which he assigns to the ambidextrous.

(3) The centre of gravity below the transverse axis, causing left-handedness.

Struthers contends that the centre of gravity depends upon the weight of the viscera. The deviation from this centre is the cause of right- and left-handedness.

V. THE HAND AND BRAIN THEORY

In 1861, Broca definitely assigned the posterior part of the third frontal convolution of the left hemisphere as the seat of articulate speech in right-handed people, the opposite holding for the left-handed.

Gratiolet attributes right-handedness to the early stages of foetal development in which the anterior and middle lobes of the brain on the left are in a more advanced condition than those on the right side. Hence, the right side of the body is

better supplied with nervous force than the left; and therefore the movements of the right arm precede those of the left.

Wilson's answer to this is given in the proof furnished by a patient of the Provincial Asylum at Toronto. This man was so inveterately left-handed that he was placed on the extreme left of his company in the army and allowed the exceptional usage of firing from the left shoulder. At death his brain was removed and weighed, showing the preponderant weight of the right cerebral hemisphere. Hence, left-handedness is an exceptional development of the right hemisphere of the brain.

That some people consider right- and left-handedness to be controlled by the position in which a child is carried, is expounded by Baldwin and at once refuted. This would prove, he says, that a right-handed mother or nurse would cause the child to become left-handed; and, of course, such is not the case. His child showed no discernible preference for either hand from the fifth to the ninth month, so long as the objects were within easy reaching distance; but when violent muscular exertion was required it was always made by the right hand. When deviating to the left the right hand was used. Up to this time the child had not learned to stand or creep; hence, the development of one hand over the other is not due to a difference in weight between the two longitudinal halves of the body. Neither had the child learned to speak or to utter articulate sound with much distinctness; and so, right- and left-handedness may develop while the motor speech centre is not yet functioning. The use of the right hand carried over to the left side shows that habit in reaching does not determine its use. Baldwin believes that right-handedness is due to the difference in the two half brains, reached at an early stage in life; that the promise of it is inherited; and that the influences of infancy have little effect upon it. However, disuse or the cultivation of the other hand may diminish or destroy the disparity between the two. This inherent brain-onesidedness accounts for the association of right-handedness, speech and music faculty.

Questions 1, 2, 3, 6, 7 and 8 of the questionnaire already given were sent out to determine whether left-handedness is common among people of impaired speech, to the Lewis, Lamb and Northwestern Schools for Stammerers.

The returns from these schools show that of 36 girls, 3 are natively left-handed; of 80 boys, 5 are natively left-handed. Most of these subjects are now partly right-handed; and it is highly probable that the others have also had their hand motion tampered with. This high per cent of left-handedness among

stammerers seems to prove the hand and brain theory: if hand motion is interfered with before speech is established the result is quite likely to be stammering or impaired speech.

In addition to the questions sent out to stammerers the following were submitted to the Ohio State School for the Deaf:

Do you talk with your right or left hand? Were you taught to use this hand?

Were you born deaf?

If not, at what age did you become so?

What was the cause?

Out of 500 returns, 78% of the girls, and 68% of the boys are right-handed; 3% and 4% respectively are left-handed; and the remaining 19% of the girls, and 28% of the boys are ambidextrous in talking and at least one other action.

Of these pupils 70% were born deaf or became so before three years.

We have no way of detecting in sign language whether interference with natural hand motion affects the speech centre while it is functioning, or not; but the great ambidextrous tendency seems to point to a freer hand motion in the absence of speech. More freedom of motion is granted in the sign language than in penmanship. Several left-handed pupils according to instruction write with the right hand, but talk with the left.

VI. THE BILATERAL ASYMMETRY OF FUNCTION

The bilateral asymmetry of function, according to Hall and Hartwell, is shown in every organ, the most familiar asymmetry in both form and function being that of the hands and arms. Dual function is well represented by the right and left brains: one of which is nearly always superior to, and controls, the other. One brain may be insane and be counter-balanced by the other brain.

The result of accurate measurement of the bilateral asymmetry of function, so far as applied to the arms and hands shows that the preferred hand makes the greatest excursion. The test of the hearing power shows the reaction by the stronger or preferred side to be greater than that made by the nonpreferred. Dynamometer tests show that the pre-eminence of the preferred hand is not in skill alone, but in exerted force as well. A maximal clenching movement by one hand is weak if at the same time a like maximal movement is made by the other hand. The failure of an attempt to repeat the standard submaximal clenching movement with both

simultaneously, instead of with one, indicates summation in repeated submaximal movements. The attention, so far as controlled by fixing the eye on one hand, has power to intensify the maximal energy of the clenching effort of the hand to which it is then directed. Attention seems to have more power over the right hand than over the left; but, if fixed on the left, commonly causes its maximal power to develop slightly in excess of the right.

Van Biervliet also favors the theory of asymmetry, even to the extent of expounding Hassen's proof of the asymmetry existing in the Venus of Milo. He asserts that in the right-handed person the right hand is the stronger, as are also the right eye and ear, and that the skin covering the right side of the body is more sensitive than that covering the left. The opposite holds in left-handed people. His experiments on two hundred subjects show that the optic, acoustic, tactile, olfactory, and gustatory motor nerves are all keener on the right side in right-handed people. He further states that in the right-handed the right nostril is the larger.

Van Biervliet says that right- or left-handedness is due to a mechanical cause coming from the beginning of embryonic life, and is not directly hereditary. He does not believe in ambidexterity, arguing that one member is always more developed in force than the other.

In direct opposition to the above theory is the one furnished by Toulouse, stating that in the great majority of cases subjects have olfaction as well as feeling and perception more developed to the left. Olfactory asymmetry means proficiency of the left nostril since this organ is in relation with the left hemisphere which commands sensorial superiority. Right-asymmetry or right-brain is left-handedness or ambidexterity.

VII. THE ULNA THEORY

W. Franklin Jones has just devised an instrument to ascertain whether a child should use his right or left hand. It is a form of brachiometer and may be used even with new-born infants. A child should be taught to use the arm having the longer ulna. He claims that in 96 cases out of 100 the ulna is longer in right arms. Out of 10,000 brachiometer tests he has discovered that 417 children were born left-handed, while 9,853 were born right-handed. 4% of the race are left-handed, while 96% are right-handed. 1% of all left-handed are shifted by deliberate interference. The many cases of feeble-mindedness and stuttering that he has met make him fear the transfer from one hand to the other. It is easy to return an individual to his birthright so far as the arms are concerned, he says.

A little practice will be sufficient to develop skill in the arm which nature intended to be used; and what nature intends in the case of left- or right-handedness should be followed to the letter.

In making the test Jones relies to a great extent upon his measurement of the 'ulna plus,' that is, the length of the ulna plus the length of the hand to the middle of the knuckle. This measure is used because it is more easily determined than the length of the ulna alone.

His returns seem to me to confirm the Hand and Brain Theory with the additional discovery of the 'ulna plus.'

Is the brachimeter test of practical value? Supposing the solution a true one, just how is it to benefit mankind? Nature will surely assert herself if allowed to do so; and, if interfered with, the brachimeter will be of no assistance unless laws are enforced forbidding interference in hand motion. It is not that people are ignorant as to whether a child prefers his right or left hand, but that they are bound he shall use his right one irrespective of his choice in the matter.

OBSERVATIONS OF HAND MOTION

Mrs. Woolley's observations of her baby's hand motions are rather significant. The first week of the seventh month the left hand was preferred, but after that the right predominated steadily, though at times either hand was used. In the eighth month the child learned to wave "Bye Bye" in connection with starting for a ride. The nurse in taking her out of the cab always carried her on the left arm, leaving the baby's left hand free; and as a result the child learned to wave her left hand. Later, either hand was used for this purpose, and finally the right hand entirely. In other pursuits the child used the right hand almost as exclusively as the adult. During the ninth month right-handedness began to be apparent. Mrs. Woolley declares the theory of the speech centre and right-handedness proved in this case, as the use of the right hand predominated when the child began to babble syllables.

Major's child at times preferred the right hand, then again had no preference for either, until in the twelfth month when a slight preference for the left hand began to appear, increasing rapidly until the child was clearly left-handed. The left movement was broken up at this time, so either as a result of training or natural tendency, the right hand was used more and more until in the second year the boy was decidedly right-handed.

Major questions what would have resulted if the child had been allowed to continue without interference or training. He

wonders whether children are natively either right- or left-handed which no amount of training can change; whether it is a matter of training; or if some children are ambidextrous but will develop right- or left-handedness under training.

Dearborn's little girl furnishes an interesting and varied program of hand motions only a few of which I shall state here. The fifth day of her life she used the right hand as much as the left though before this she had shown signs of left-handedness.

168th day she was very left-handed; 303rd day she was right-handed; 358th day ambidexterity played an important rôle; 595th day on, the right hand predominated.

Dearborn concludes that "the left side of the body seems both more reflex and somewhat more precocious than the right side. It seems to be more distinctly the mechanical implement of the organism's will while the right side is still largely reflex."

AMBIDEXTERITY

The late Sir Daniel Wilson was an artist of considerable ability. He was natively left-handed but through education cultivated the use of his right hand thus becoming ambidextrous. Much of his artistic work, however, was done by the preferred hand. As one enjoying both sides of the situation, he makes in his book a hearty plea for ambidexterity.

Henry Jones Macnaughton says: "As in the instance of polarized light, molecular arrangement in the brain may account for the freedom of the right hand over the left." He maintains that there is nothing discernible of an organic nature in the cortex of either hemisphere of the brain to explain any functional difference or superiority of one over the other. Man was originally endowed with a dual psycho-motor co-operating capacity of brain and hand—simultaneous or alternating. The brain is a dual organ and each hemisphere is capable of independent action. That a great coördination exists between speech and writing is clearly shown in pathological cases such as aphasia, in which the understanding is clear, but the patient is unable to convey his ideas in speech; amnesia, when there is confusion in recalling words and in applying the correct ones; and in agraphia, when the person may be able to express himself in language and yet be unable to write the words he wishes to use. Such cases of pathology are found but seldom in left-handed or ambidextrous people, who, by education or custom, are strongly influenced to use the right hand largely, hence working the left as well as the right hemisphere. These diseases are often successfully treated by compelling the patient to use his non-preferred hand and

thus bring the latent force of the accompanying brain into play Aphasia, according to one estimate, is, in fourteen out of fifteen cases, a disease of the left brain. This is decidedly an argument for the cultivation of both hands.

Macnaughton heartily favors the acquisition of simultaneous, two-handed writing, drawing and technical work, arguing that ambidexterity requires will power and control, concentration of mental effort, and contributes to the formation of character and intellectual growth. Man's intelligence cannot be bisected.

The nascent or developing period of the hand centre probably extends from the end of the first year to the end of adolescence, but the most active period is from four to fifteen years, after which time the centre becomes comparatively fixed and stubborn. During this period of development any forceful change from left to right, or vice versa, may result disastrously, causing, for instance, neurotic disorder, impaired speech such as stammering or stuttering, or indeed, complete imbecility. Neurasthenia and *neuro-mimesis* he claims to be caused by work taxing to the utmost one side of the brain and body. Simultaneous writing and ambidextrous motion in general would guard against all such diseases.

Schuyten also advocates the symmetric education of the different parts of the body, thus doing away with atrophy.

Lueddeckens affirms that at the beginning of embryonic life the symmetry of the organs is complete: even the vascular system is absolutely symmetrical from the heart to the veins and capillaries. The unequal development of the vascular system comes with the inequality of blood pressure which is stronger on one side of the head. Right-handedness is the result of the high blood pressure in the left head—where cerebral hemorrhage is most often found.

Another strong advocate of ambidexterity is Varia Kipiani. She says that the child at the beginning of life is ambidextrous; but this natural tendency is destroyed by educators who insist upon unilateral growth. Many types of tic, St. Vitus Dance, professional cramp and neurosis are the result of occupations in which unilateral muscular motion is in play. She considers that excess of unilateral cerebral, asymmetric work frequently disequalizes the nervous system of the school child from ten years of age to puberty; and is thus responsible for neurasthenia, chorea, St. Vitus Dance and the many cases of tic met with in school life.

As an argument for ambidexterity many writers cite instances of left-handed or ambidextrous nations. According to Pliny, the Gauls in their religious rites, contrary to the Roman custom, turned to the left. The Scythians, noted for strength

and valor of conduct, were ambidextrous. The Ancient Egyptians show in their works an inherited evidence of a prevailing ambidextrous faculty. A large proportion of the Persian workmen of to-day are ambidextrous; and among them the left hand is commonly used for signing letters or documents. By far the most striking example of ambidexterity among modern nations is that of Japan. There ambidexterity is taught in the schools and practiced in all the arts. The trait dates back to the remotest history of the race, and the gift is equally possessed by both sexes. Japan of all modern nations exhibits the most wonderful craftsmanship and manipulative skill, as is shown by originality in design; delicate carving in ivory; marvelous lacquer and gold ornamentation; beautiful inlaying of woodwork as also of gold and silver; unsurpassed embroidery and lace-work; tortoiseshell and silver enamel; and copper casting.

The ambidextrous and left-handed are proud to claim in their ranks these well-known men of talent: Michael Angelo, Leonardo da Vinci, Holbein, Landseer, Mozzo of Antwerp, Amico Aspertino, Ludivico Congrago, Sir Daniel Wilson, and Sir Baden Powell.

It is quite generally agreed that the percentage of left-handed people is two in one hundred. Jackson's investigation proved that 3% are incurably biased to left-handedness; 17% to right-handedness; while the remaining 80% are normally ambidextrous.

My own investigation of three public schools however showed that of the entire 2,055, 4½% of the girls, and 5½% of the boys are left-handed in practice. No doubt if the natively left-handed were to be added the percentage would greatly increase.

Is left-handedness increasing or decreasing?

This question is duly considered by Romaley who terms the left-handed person a Mendelian recessive. In a family containing a left-handed child perhaps neither parent is left-handed, nor has any ancestor for a number of generations been so affected. Such a condition probably exists in about one-sixth of the population. Left-handedness among parents is greatly underreported as the number of left-handed children is twice that of left-handed parents. He concludes thus: "Recessive mutants, unless of inherent weakness in some respect, must tend to increase in number at the expense of the originally dominant right types."

To determine the relation of left-handedness to general intelligence and character questions were sent out which brought me most deplorable returns.

500 reports from the Trenton State School for Girls, the Hallowell State School for Girls, the Shirley Industrial School for Boys, show that 11% of the boys and 6½% of the girls are left-handed. This seems to agree with the old idea of wickedness accompanying left-handedness. Notice, however, that it strongly disagrees with the former belief that this wickedness prevailed in the feminine gender. It is almost 2:1 against the boys.

200 returns from the Rhode Island and Maine Institutions for the Feeble-Minded show that 11% of the girls, and 8½% of the boys are left-handed. 4% of the girls, and 5% of the boys, are ambidextrous but prefer the right hand.

Does this not prove that there are many more cases of feeble-mindedness than we usually credit? Here, education has probably had no part, hence the native motion has prevailed.

The ambidextrous tendency seems to be a thoroughly native one.

Yet we find left-handedness well represented in all walks of life; the highest scholarship and honor lists include left-handed people. Then, too, many a brilliant so-called right-handed person must cast his die with the natively left-handed if real facts be known. He has been so well educated in the use of his right hand as to make it appear a natural one. Hence, data on the left-handedness of adults are quite likely to be faulty.

Left-handedness is viewed by many as little short of an affliction; and many of the so-afflicted must be often humiliated and at times seriously injured by the coercive methods used in breaking up this natural motion. We do find extreme awkwardness in connection with left-handedness, but is right-handedness entirely free from this condition? I think if we fairly examine the case we find that for every ungraceful left-hand motion may be found a proportional number of awkward right-hand acts. Sinistrality may be dextrality at the same time, and vice versa. Yet, any natively left-handed person I feel, greatly appreciates a right-hand training. He is thereby enabled to comply with the rigid rules of polite society, and still use his stronger or preferred hand for exceptional cases.

The destruction of native left-handedness must sometimes result in the loss to the world of a talent concealed in that paralyzed member.

Fine penmanship is found among left-handed subjects who are properly trained and have adequate practice, which, indeed, is necessary for good right-hand script. Are instructors

of penmanship, especially in the grammar grades, wise in compelling the use of the right hand even in the most stubborn cases of left-handedness? May they not be largely responsible for the many nervous disorders found in their little victims?

Many every-day acts call properly for ambidexterity or left-handedness. The manipulation of most musical instruments is a two-handed one; and the piano player calls for left- more than right-hand motion. According to the position of door knobs the hand used on entering is not that which should be used at the exit. Rowing often requires a two-hand motion as does sculling, also. Many accidents occur on the railroad and street railway which might be avoided if people would only learn to use their left hand instead of their right, when stepping off the car. The right hand grasps the handle of the seat or car, and hence the body is turned toward the right in such a way that the person steps off backwards. If the car is in motion he is thrown upon the back of his head. When the proper hand is employed the body swings out from the left hand, and the person faces the direction of the car. Then if he steps off while the car is in motion he may either run forward until his equilibrium is maintained, or simply be cast forward, in which case his head will not be in immediate contact with the pavement. Men's coats button to the right hence calling for a right motion; while women's coats have an opposite buttoning system calling for left-handedness. It is interesting to notice the conflicting movements involved in this matter-of-fact performance. You will see an apparently right-handed man deliberately decline the convenience made for him, by using his left hand. Then, again, a left-handed woman will button her coat with the right hand. Many people use the two hands in buttoning; but the majority, whether right- or left-handed, follow the law set for them—the men, right; the women, left.

In conclusion, the following data which do not entirely agree with commonly accepted statements as to left-handedness, may be once more stated for emphasis: As against the usual statement that 2% of the population are left-handed, my returns from 2,055 school children show that 4½% of the girls and 5½% of the boys are left handed; out of 500 delinquent children, 6% of the girls and 11% of the boys; out of 200 feeble-minded, 11% of the girls and 8½% of the boys; out of 500 deaf, 3% of the girls and 4% of the boys; and out of 200 blind, 11% of the girls and 10% of the boys.

The high percentages of the blind, feeble-minded and delinquent are especially striking and call for further study and explanation.

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WHY CLASS WORK IS OF LIMITED VALUE IN THE TREATMENT OF STUTTERING

By MABEL STEVENS

Since stuttering usually appears in childhood and prevents a pupil's good work in the public schools, new departments are being opened and classes are being formed there to meet this condition.

To change the stutterer's speech to normal is a praiseworthy effort; to transform the stutterer himself is to reach the root of the trouble. It is the opinion of eminent authorities that the latter duty cannot be thoroughly performed by means of class-instruction. The idea of such means as sufficient, springs from regarding the stutterer as a pupil rather than a patient, and his affliction as a bad habit to be broken, instead of a disease to be cured. This attitude is fundamentally wrong. Fortunately we are rapidly outgrowing it.

Even after these patients are cured, they must be thought of as convalescents, and treated with tender consideration for some length of time. Under no circumstances should a former stutterer be subjected to a rigid examination or test for speech-defects, thus practically saying to him: "*You could not speak properly. Can you do so now?*" To insist on such a proof that he has "learned his lesson," as popular conception would express it, may have the effect of re-awakening the old difficulty.

Dr. Emil Fröschel, of Vienna, declares that if the stutterer enters an institution, the treatment should nevertheless be strictly individual "*streng individualisierend*." This is next to impossible in any public school. When there are enough applicants to warrant engaging a special teacher, then first from point of numbers and second from lack of time, the assistance cannot be primarily personal. The Chinese custom of having a teacher for each scholar would be the ideal arrangement. The matter of expense alone would prohibit that, however. Thus it will remain forever true that the State cannot make the best provision for these unfortunates, but only the *second* best.

In many cases the permanent cure of stuttering is found to be conditioned upon "*a readjustment of the subconscious*." The patient's state of mind toward life in general, and his in-

mediate environment in particular, is quite peculiar. Therefore in order to secure satisfactory results, correction of character must be carried on simultaneously with the correction of speech-defects. This leads us to the true conclusion *that speech-defect and character-deviation are closely connected.*

Dr. Wilhelm Stekel, of Vienna, predicts that psycho-analysis will be the method of the future for the treatment of stuttering; for the reason that only psycho-analysis probes to the seat of the trouble.

We have referred to stuttering as a disease. Its symptoms have been described by many physicians, and methods of treatment have differed in various ways. In the last analysis it seems justifiable to speak of stuttering not only as a disease with symptoms, but as itself a symptom—a *symptom of emotional conflicts and repressions*, stuttering is the expression of a psycho-neurotic state whose basic element is embarrassment, or fear—with its counterpart, desire. The statement is often made, "Our child is nervous, painfully embarrassed, but he exhibits no fear, he simply stutters." True! Yet the stuttering is but a manifestation, a surface evidence of an undercurrent of fear. Heretofore fear has been called a symptom of stuttering. But with greater cogency, in the light of recent developments, we may declare stuttering to be a symptom of fear. Fear is behind the stuttering. But what is behind the fear? To reveal *that*, is the aim of psycho-analysis; and the cure consists in helping the patient to make the discovery for himself. That the cause of the specific fear must be somewhere in his individual life-history is perfectly self-evident. That the release from fear can only be a strictly individual experience is as true as that stuttering is an individual affliction. This is the position maintained by psycho-analysis. It goes further than any other method. It investigates deeper. It touches bed-rock.

A COMPARISON OF METHODS

As the arrival of a new theory creates discussion, so the appearance of a new method stimulates comparison. Therefore, since it has been the writer's good fortune to have some acquaintance with three chief methods for the treatment of stuttering, it seems worth while to note how they stand toward each other and toward the Freudian which promises to supersede the others. Slightly in harmony with it is the Liebmann (method); distinctly antagonistic is the best known, the Gutzmann; and boldly combined with it is the last of the three, the Scripture.

Because this paper will be confined to stuttering, to avoid

misunderstanding it may be well to state here, in the beginning, the difference between stuttering and stammering—for they are not interchangeable terms, as many publications in English would lead us to infer. Concisely given the distinction is this:

The continuity of the stutterer's speech is interrupted by spasms of the muscles involved in speech-production; the continuity of the stammerer's speech is not broken, but his pronunciation is at fault. The stutterer *can* make every sound and combination of sounds, the stammerer cannot. In other words:

1) The stutterer has cramps of the speech muscles; the *stammerer* has *not*.

2) The stutterer cannot speak fluently; the *stammerer can*.

3) The stutterer can pronounce correctly; the *stammerer cannot*.

(To these should be added:)

4) The stutterer suffers from accessory muscle-movements ("Mitbewegungen"); the *stammerer never*.

Gutzmann describes the difference in one sentence by saying: "Stottern ist ein Fehler der Rede; Stammeln ein Fehler der Aussprache." (Sphhk., p. 490.)

Before leaving this comparison, one other matter must be mentioned, as it gives ground for wide divergence in treatment. The greater conscious effort a stutterer makes to talk in a normal manner, the worse his speech is obstructed; but the closer concentration a stammerer gives to overcome his difficulty, the better the result. Therefore the stutterer's attention must be diverted; the stammerer's attention, stimulated. The stutterer must learn to speak with less concentration, the stammerer with greater. (St. K., p. 73.)

Logically then, we might conclude at once—that stuttering and stammering are not open to the same process of correction—that a kind of treatment beneficial to the latter trouble may be harmful to the former. Liebmann is convinced that, on principle, the therapy of stammering must be different, in general, from that of stuttering. (St. K., p. 73.) In regard to harm it appears to be true that any exercise *whatsoever* which turns the stutterer's attention selfward in a morbid way is harmful; but if he can become so absorbed in what he is doing as to forget himself, then even an unnecessary exercise has relieved the patient for the *time being* and done that much good.

This brings us to a second point raised. Are certain exercises superfluous? Take another of the above given *comparisons* and see if it is not justifiable to question thus: The

stutterer being *able* to produce all possible sounds, why should he be bored with exercises in vocalization and articulation?

Here we strike another subject of contention. Liebmann confidently asserts that all such exercises can be entirely dispensed with—"that one arrives at the goal quicker without them." (St. K., p. 8.) Much that is done for the stutterer is sheer waste of time and strength. There is much misdirected effort. Also, a method requiring the patient to speak in an unnatural manner long enough to form an annoying habit, may fix a peculiarity as difficult to remove as the stuttering itself. To avoid these pitfalls, exercises thought necessary by Gutzmann and his followers, Liebmann declines to use, and then proves quite superfluous, as his success testifies.

Upon what further theory and practice this success depends, we can discover by a more extended search. For now, having disposed of preliminaries, we may divide our investigation into three parts, and take up here

Part I. THE LIEBMANN METHOD¹

In this method there are important things to be noticed, such as the following: The stutterer does not need a course in phonation. He can speak as well as anybody, *if* his extreme *self-consciousness* and his painful anxiety are removed. His unnatural breathing is caused by anxiety—hence, do not bother with breathing-exercises; but exorcise the fear. So Liebmann believes that the physician's chief aim should be to free the patient from anxiety. This purpose is in harmony with that of psycho-analysis; but there the similarity ends, save that both methods necessitate individual treatment. He says it must be "*primarily psychic*," and though an observer soon becomes aware that its best results are from the effect of soul upon soul and perforce educational, yet they are not so in the deeply penetrating way distinctive of psycho-analysis. Liebmann's method is based largely upon the personal influence of the physician and upon the power of suggestion. A gentle, persuasive sympathy soothes the patient's excitability and overcomes reluctance and hesitation. Praise is one of the most potent agents in casting out fear; and a little flattery raises the patient's self-esteem while erasing the memory of the cruel sting of past ridicule. Timidity gives place to courage; because there will be no such thing as failure, it is excluded. If perchance he stutters, it is overlooked. The doctor's imperturbable calm remains unmoved. Perhaps he did not hear. Maybe it was *insignificant* anyway. With a

¹ See "*Stotternde Kinder*" von Dr. (Med.) Albert Liebmann, Berlin. Verlag von Reuther u. Reichard, 1903.

glad heart the patient begins to think so, and then progress is rapid. From the initial half-hour on the first day to the last treatment of the series stuttering is *prevented*. This is brought about 1) by assigning him only what he will be able to do, either with or without help; 2) by speaking and reading together; 3) by gradual withdrawal of assistance; 4) by interrupting him when he seems on the verge of stuttering; 5) by giving him "psychic preparation" when a strain upon his nerves is likely to occur—for instance, if he is to converse with strangers.

Of course a stammerer out of childhood will wish to know and will ask why he stutters. But even a child can understand the so-called resistance-theory—"Der konsonantische Widerstand"—also known as the theory of the exaggeration of the consonants. A child can distinguish between vowels and consonants. With the aid of a plaster-cast, a child can be made to realize that when consonants are sounded, then at the larynx, the palate (hard and soft) the teeth, the lips—as the case may be—the outgoing breath is kept from having free passage into the open air—in other words, meets with greater or less resistance. Next he is told that in stuttering the resistance is *too strong* and lasts *too long*. The consonants are held longer than is natural; *they are exaggerated*; and pauses take place, only ending when the vowel comes at last. (St. K., p. 11.)

The child can *feel* how much easier it is to sound the vowels—that no special resistance is offered then. Finally he sees that singing must be easier yet because the vowels are lengthened. Nearly all of the patients are very young children from five to seven or eight years of age. It would be senseless to talk to them about voluntary and involuntary incoördinate breathing and speech-movements, so the doctor fits the explanation to the patient.

This insight gained, he is ready to go through the various requirements in the approved succession from the least to the most difficult, as follows: 1) Singing. 2) Use of lengthened vowels in separate words and in short sentences spoken with instructor. 3) Short sentences repeated after the instructor who ceases gradually to lengthen the vowels. 4) Question containing part of answer. 5) Reading with no omissions and no changes of text. 6) Short story given sentence by sentence, patient repeating word for word. 7) Same story given connectedly. Patient repeats it. 8) Long story given connectedly but once; patient tells what he remembers. 9) Patient must read through a story of several pages and give it in his own words as a connected whole. 10) Ques-

tions in Mathematics, Physics, Geography, History, etc. 11) Topics of the day. Spontaneous speech. 12) Conversation in foreign languages.

During all this time the doctor's effort has been to establish complete coördination of the speech-movements. This harmony cannot be gained while the patient's thoughts are constantly occupied with his feelings. To turn his mind elsewhere has been one aim of the speech-training. Little children are given picture-cards with one object shown on a card; then follow picture-books with one picture and perhaps a short story on a page. The text must be simple and offer material for question and answer. After a while larger books with more interesting pictures and longer stories increase the difficulties but also the fascination, until finally very large pictures mounted on card-board and having movable parts—representing birds, bridges, tools, men, women, children, etc.—accomplish the desired end. The child-stutterer is far, far away from his troubles, and he talks freely and fluently without shyness, embarrassment, or fear. Thus the coördination is *conditioned* upon the removal of fear—the general fear of speaking (Sprechangst) and the special fear of certain sounds (Lautfurcht).

Of what is the patient afraid? Seemingly of the *act* of speaking; or he may be afraid of some sound difficult for him to make. Liebmann does not specify that the stutterer shrinks from some *other* difficulty buried in the depths of his being, or that he may really be afraid of himself; and that the fear is often transferred to these conscious acts—as Freud has taught us. Every thinking human-being will seek to give a reasonable explanation of his fear. The stutterer appears to be doing this; but his anxiety is entirely out of proportion to the *ostensible* cause, and the adequate one is far “out of sight, out of mind” in the depths of the subconscious. This illustrates the light that was darkness before the advent of psycho-analysis.

So it is seen that the “psychic treatment” and speech-training are inseparable. Liebmann concedes that many roads lead to the Rome of success; but he condemns utterly some of the “helps along the way”—Ex.—The use of a book of exercises. He says: “The children are obliged to read the same stories, learn and repeat the same poems, answer the same lists of questions over and over again. A parrot-like facility is attained; but this is poor preparation for daily life.” It must be admitted that the little Übungsbuch arranged by Albert Gutzmann, and recommended by his son, Professor Hermann Gutzmann, falls in line with this criticism.

In the Berlin public schools any visitor may have the pleasure of seeing how well adapted such exercises are to class work; yet he can seldom manage to go home with a pupil to find out whether hesitating speech has ceased there.

On a number of important matters Liebmann is at variance with Gutzmann and has classed his method as among the less serviceable ("weniger brauchbar.") In this connection it will be of much advantage to consider the principles upon which the latter method is founded.

Part II. THE GUTZMANN METHOD

Perhaps we shall arrive sooner at the heart of the matter by making quotations now and then.

First Gutzmann wishes us to understand that in spite of every effort, one will never be able to cure stuttering by psychic means alone—because the Kussmaul definition still holds good that stuttering is a spastic coördination-neurosis resting upon an inborn (congenital, "angeboren") weakness of the articulation apparatus.² For this reason hypnotic treatment has been of no avail except when employed in connection with a drill-therapy ("mit einer physiologisch-gymnastischen Übungstherapie.") So likewise suggestion apart from hypnosis, is absolutely of no use, if the stutterer is not shown correct speech-coördination ("die richtige Koordination der Sprache.") The mere removal of wrong ideas and anxious imaginings will accomplish nothing. (Sphhk., p. 394.)

Nevertheless, as we have seen, Liebmann reports success through simple suggestion and without the aid of physiological-gymnastic exercises. In his opinion the sole value of the latter lies in their psychic effect. He writes, "If the doctor succeeds in impressing upon the patient the conviction that by means of these exercises in breathing, vocalization, and articulation, he will learn to speak better—then, gradually the desired result will be brought about." (St. K., p. 51.)

Fröschel is of like mind for he says, "It lies far from me to doubt the *serviceableness* of the Gutzmann method, especially since I myself have used it for years, only I explain its worth otherwise than does Gutzmann. Namely, aside from the training of muscles grown accustomed to wrong action in breathing, I attribute to it solely (lediglich) suggestive value, and it seems to me no less adapted to this purpose than the other methods which I also use as helps."³

² See "*Sprachheilkunde*" von Prof. Dr. Hermann Gutzmann. Berlin, Fischer's Medicin. Buchhandlung H. Kornfeld, 1912.

³ See "Über die Behandlung des Stotterns" von Emil Fröschel (Wien Univ.), vol. III, 1913. "Zentralblatt für Psychoanalyse u. Psychotherapie, p. 497.

Gutzmann finds in his own drill-therapy an extraordinarily strong suggestive factor that of itself works psychotherapeutically. Further he adds: "*It is questionable* whether those speech-disturbances (Stuttering, Cluttering, Phonasthenia, etc.) where the morbid activity of the emotions makes itself very plainly apparent, require a special psycho-therapy besides." (Sphhk., p. 191.)

In another place we read: When the patient becomes aware of the fact—I must speak thus and so; that is the way all other people speak; if I speak as directed, I cannot stutter—then the problem (Rätsel) of psychic treatment is solved. There is need of no other ("Es bedarf eben keiner mehr.") (Sphhk., p. 437.) Also—"He who follows the physiological method aright needs no special psychic method of treatment—the psychic treatment lies within the *conscious physiological practice*, being its very essence." (Sphhk., p. 437.)

From similar sentences we feel certain that Gutzmann will not look upon psycho-analysis with favor. This expectation is realized when his criticism of Stekel is before us. To be sure more leniency is exhibited toward Frank and Laubi. (Sphhk., p. 397, 438, 444) yet the general remarks are somewhat acrimonious—possibly not without cause as may presently appear.

Gutzmann declares that "*in all cases*" the psychic depression is ("eine Folgeerscheinung") a manifestation resulting from and hence following the stuttering. Thus he believes the speech-disturbance to be the primary evil and the depression, the secondary one. (Sphhk., p. 391.) But psycho-analysis considers the emotional disturbance primary—the stuttering secondary. The obvious impossibility of maintaining at the same time, two opinions so conflicting that one is a complete reversal of the other, tells us why Gutzmann *must* be hostile to the Freudian method, if he wishes to hold his own. Are not signs of irritation, on his part, a good indication that the antagonist is formidable?

Both Liebmann and Gutzmann interest the stutterer in something. Now one might think it of small consequence whether pictures or gymnastic exercises, for example, held the child's attention, but such would be a mistaken idea. Liebmann's patient is really able to forget, for a while, his own existence, but Gutzmann's patient is reminded every moment of his body and of his affliction. The relation between self and the important task is ever kept in the foreground of consciousness. Everything is for self, through self, and to a large extent by self. A lazy or an indifferent stutterer will

never bring about the desired cure, because part of the treatment is *conscious* self help. He can hire no substitute; the ego must work out its own freedom. In this there is resemblance to psycho-analysis. The master-mind of the physician, furnishes the necessary knowledge, and directs the various efforts required of the patient who, however, is obliged to use his own brain powers.

Liebmann would have the stutterer's transformation wrought naturally, by a process as unobtrusive as growth. Gutzmann calls "*conscious* physiological practice" the chief thing, "*the soul*" of his method. (Sphhk., p. 436.)

Now when the emotions have been relegated to second place, then the treatment has to consider will-power before feelings. The supreme thing for the patient is to acquire good control of the body. In the particular matter of normal speech production, Gutzmann insists on correct breathing as the first essential. If the stutterer is to perform a miracle, he must gain strength of the respiratory muscles, and skill in their use. To this end breathing is combined with gymnastic exercises. Conscious control of the breath is imperative; and the energy can be developed in the average patient. One fine exercise demands the conscious separation of associated muscular movements. Usually, however, the more or less difficult attempt is made to coördinate certain muscular actions which do not function together as they should. Even though, as a rule, one cannot locate anatomically a definite central lesion to account for the stuttering, yet we are assured that the seat of the trouble is central. Moreover, as Gutzmann says, cultivating vigor of will constitutes also an exercise of the center or centers which control coördination of the muscular activities. So in this way we make a direct attack upon "*den Sitz des Stotterübels.*" (Sphhk., p. 154.)

The Gutzmann patient must know both what he is doing and the reason why. Hence with each exercise is given a question or a set of questions which he must answer as instructed. When he has memorized the printed explanations, then he cannot be ignorant of the subject-matter, and the right replies will be forthcoming. These exercises and accompanying questions are intended to form part of the daily program.

In vocalization we are shown at once that in passing from (1) Breath to (2) Whisper, and from (2) Whisper to (3) Voice—during a single expiration—we have "*the foundation exercise*" for every systematic voice-practice (training.) (Sphhk., p. 17, and p. 158.)

Moreover, it is important to observe the succession as in-

icated—" for by keeping to this normal order those muscles move (one after the other) which must work together in *immediate* voice-production. A complicated, coördinated action (*Bewegung*) of the involved muscles is thus split up, or separated, into its several components—first separated and then reunited to produce *voice*. When this is effected the so-called " *Stimmkoordination* " is again restored.

After the patient has learned to do this, then he is thoroughly drilled in the three different modes of attack—1) the hard (or direct), 2) the aspirated, 3) the soft (or indirect)—*der feste Stimmeinsatz, der gehauchte, der leise*. All the words must be practised in this manner. As to pitch and intensity, the *one* should be as low and the *other* as slight as possible, depending on the individual concerned.—When single words are taken, the patient is trained to give the initial vowels gently, softly, and considerably lengthened. The same is true of the first vowel of the first word after any pause for breath—thus, of course, at the beginning of every sentence.

To avoid unnatural pauses and to increase fluency, the words of a sentence are linked to each other and are spoken like one long word. In this way smooth, unbroken speech is secured in the progress of time. Frequently some preparatory work is of advantage before entering upon the difficulties of perfect articulation. This is indispensable if the patient is backward in speech development: Lip-gymnastics, tongue-gymnastics, jaw-movements serve to gain flexibility and thus to strengthen weak muscles. So when the stutterer comes to the consonant exercises, he can take correct positions and give the various sounds with less exertion. He receives the necessary directions, and soon he thinks himself able to tackle any sound-combination in the language. The consonants, in turn, all have attention; and they are used in syllables, in words, in sentences—as the case may be. The same consonant may occur many times in the same sentence; or a certain rule may be illustrated by a group of sentences.

From single sentences unconnected in thought, the stutterer passes to short stories, then to longer stories, poems, and dialogues. These are made more valuable through free conversation, narration, declamation, etc. Thirteen rules for speaking (*Sprechregeln*) are learned by heart, and if the patient can remember to carry them out, day after day, his self help has become practical.

Liebmann has referred to this method as among the "less serviceable" because he thinks that very young children cannot hold to "conscious practice" all the time—and that for older children and adults the course is a very roundabout

way of reaching their heart's desire. Also he sees that the patient runs a risk of being made ridiculous. The sharply distinguished vowel-positions, the speaking in a soft, low-pitched voice, the lengthening of the first vowel in the Sprechsatz (whatever can be spoken in one breath)—these all encourage speech habits too conspicuous to escape notice. The quick, deep breath *drawn through the mouth* just before speaking, seemed to be the most objectionable *requirement* made in the speech defect classes in the Berlin public schools when the present writer visited them not long ago.

Now from over-drill the numerous exercises can be given automatically, thus destroying their value. Gutzmann warns against mechanical work. Such a contingency need hardly be planned for under the Liebmann method where an infinite variety of material is offered and where repetition is discouraged.

Gutzmann says it is easy to prove stuttering a coördination-neurosis. This can be done by examining the stutterer, and testing separately the different components of speech when the element of anxiety is excluded—"mit Ausschluss der Angstafekte." Evidently he does not mean excluded from the patient, but excluded from the patient's speech. We read:

Test I. "For example, when I test the patient's ability to make a long, even expiration—such as is necessary for fluent speech—then I do not allow him to speak at all. Hence in the stutterer, the anxiety-affect, *too*, cannot *emerge* for that reason—and as a matter of fact he imitates the slow expiration at once." The word "*emerge*" (auftauchen) is significant. Its use implies not that the anxiety has been actually banished, but that it is in repression. The little word "*too*" (auch) indicates the same thing. Therefore we are not surprised over what comes next: "But if we see how he makes that expiration, then we find in every stutterer *without exception*, gross faults in the mechanism—we find, for instance, that the expiration comes to an end within (schon nach) a very short space of time, that after from four to six seconds no more air stands at (the patient's) disposal; or else, that what may be there goes out irregularly, in jerks—'saccadiert.' The total volume of air is not, however, diminished thereby—for the vital capacity of stutterers is entirely normal. Ergo, it has to do with faulty functioning—with the wrong use of the necessary, sufficient volume of air." (Sphhk., p. 392-3.)

Since it is a well-known fact that fear and anxiety make the breathing shallow, quick and irregular, why may not this

“faulty functioning” be due to the anxiety-affect which has been prevented from having outlet in speech?

Test II. As speech cannot be divorced from breath, so a voice-test must be made subject to that condition. Gutzmann continues: “But there are stutterers enough who can sustain a given vowel quietly, without difficulty and without stumbling who also do not even stutter upon beginning the vowel.” Here a voice-test will show departures from the normal. “One finds a slight tremolo, varying intensity, inability to keep the same pitch, etc.” (Sphhk., p. 393.)

Test III. Gutzmann then adds: “Likewise one can very easily convince one’s self that the stutterer is making wrong movements even when he appears to be speaking fluently.” (Sphhk., p. 393.) His trouble shows itself in the characteristic faulty respiration. Gutzmann mentions having often observed cases of this kind; and he draws the conclusion that stuttering may not be identified with stumbling (Anstossen.) He says: “Stuttering is the general disease taken as a whole; Anstossen on the other hand, only the especially clearly visible and audible manifestations. Consequently there are stutterers who do not stumble in speech and nevertheless stutter. That sounds paradoxical, but it is a fact. I have had under treatment stutterers whom I have never heard stutter; and I would not have known where a drill-therapy should begin with them, if—with the help of the respiration-tests described—I had not laid bare the disturbances which had *not* become apparent upon superficial observation.” (Sphhk., p. 408.)

This broad conception of stuttering is thus made to include cases which do not have the usual outward manifestations, cases which would be quite mystifying were it not for the revelations of the respiratory-curve. In other words, they appear to be cases marked only by a disturbance of breathing. But since fear (anxiety) may produce the same “faulty functioning,” how is anyone to tell which is the foundation-cause, stuttering or “angst-affect”? Has not the respiratory-curve much interest for the psycho-analyst in connection with hysterical conversion?

Some of the most fruitful results have been obtained in experimental-phonetics by the study of “respiratory-curves.” A graphic representation of the stutterer’s peculiarities of breathing may indicate the true difficulty in obscure cases.

The study of respiratory-curves is most satisfying, and Scripture has devoted much time to it. With this statement we have come to the place where an insight into his method will be the next step.

THE SCRIPTURE METHOD

Scripture has utilized psycho-analytic principles to re-enforce a melody-cure of stuttering.⁴ We are asked to think of stuttering as "a diseased state of mind," as a serious disturbance whose cause is "*purely mental*," below the threshold of consciousness, and hence unknown to the sufferer. Since it is quite possible that conflicting desires may delay, or prevent, a cure, therefore his self-concealed motives must be lured from their place of retreat, and the physician must make the patient acquainted with himself. Consciously he may wish to be cured; subconsciously, *not*. The reason may be surprisingly simple. Thus Scripture suggests that an extremely timid person instinctively may seize upon stuttering in order to secure much loved solitude. *Certainly*,—a human being in an infantile stage of *development* may take such means to an end; and it should not be forgotten that stuttering begins in most cases so early in life—it may even appear when a child is but two years of age—that the mind has not yet been trained in discernment. Then by the time the stuttering is firmly fixed, the original motive for it has probably passed out of consciousness and cannot be produced upon inquiry. To establish in the patient a conscious connection with the infantile period of his existence is the most certain way to make his obstinate symptoms vanish when their true causes become known to him. This duty can only be performed through psycho-analysis.

Liebmann explains the stutterm's fear as chiefly the cumulative effect of many "psychic insults," while Scripture accounts for the anxiety as due "*partly to past failures, and partly to underlying causes*" well worth painstaking search. He mentions fear, anxiety, embarrassment, etc.—but he seems to prefer the milder term "timidity" to describe the stutterm's attitude toward his environment. Whether timidity comes from stuttering or stuttering from timidity is a question which Scripture answers in favor of the latter view. First he writes: "It may well be that timidity is the basis on which stuttering arises. If this be true, stuttering would then be a condition in which timidity shows itself by a peculiarity of speech." (S. & L., p. 39.) Further on he concludes,— "Stuttering is therefore a diseased state of mind which arises from *excessive* timidity," etc. (S. & L., p. 41.) But why do not all timid people stutter? Why do not neurasthenics and psychasthenics have speech-difficulty, when their mental condition is often found to be similar to that of the stutterm?

⁴ See "*Stuttering and Lispings*" by E. W. Scripture, Ph. D. (Leipsic), M. D. (Munich). Macmillan Co., New York, 1912.

Scripture says,—“When the normal speech-mechanism is strong, the psychasthenic impulse must find some other outlet.” (S. & L., p. 41.) Here we recall the recognized fact that little girls learn to talk at an earlier age than little boys and speak more fluently. The normal speech-mechanism of the normal little girl is remarkably strong. May not this indicate why girls are more likely to become hysteria-subjects than stutterers? In a comparatively recent article Fletcher⁵ gives the following as one reason for rejecting psycho-analysis in the treatment of stuttering. He writes,—“The hysterical conditions supposed to be caused by the suppression of the sexual complexes seem to be more characteristic of females than of males, while stuttering is many times more common in males than in females.” (p. 244.) But Stekel speaks of stuttering as “eine Form der Angsthysterie.”

Could not stuttering be considered the equivalent (the substitute) among males for hysteria among females?

Now even though Scripture has referred to timidity as “the basis upon which stuttering arises,” yet he places anxiety (fear, embarrassment) second in the list of symptoms. There we find named first—“psychic *hypertonicity* and spasms of the muscles of speech.” Moreover this overtension appears only when the stutterer intends to speak. Also, if he is unheard—or thinks himself so—he has little or no difficulty in giving oral expression to what is passing through his mind. Scripture’s observation confirms that of Liebmann, but is contrary to Gutzmann’s. Scripture reports,—“When a stutterer who has become so accustomed to me that he speaks perfectly in my presence, is placed at the telephone, he will continue to speak perfectly as long as he sees my finger on the switch that cuts it off; the moment it is removed he knows that ‘central’ will hear him and he begins to stutter.” (S. & L., p. 36.) He must be virtually *alone*. Scripture calls attention to the existence of these stutter-symptoms *only* in the presence of other people. So the stutterer’s *retiring disposition* is explained as either a natural inclination, or as a measure of self-protection.

More or less severe cramps or spasms of the speech-muscles are the most distressing symptoms of stuttering; and to remove this over-tension is the object of the “melody-cure.” In this method as in others, the normal speaking-voice is approached by way of the *singing-voice*. The patient’s high-strung, emotional condition must be relieved by practice in general relaxation, and there must be exercises to correct

⁵ See “An Experimental Study of Stuttering,” by John Madison Fletcher, *Amer. Jour. of Psychology*, April, 1914, pp. 201-255.

abnormal functioning. We find abdominal-cramps, diaphragm-cramps, laryngeal-cramps; indeed, cramps of all the muscles connected with speech. To overcome the first two hindrances to fluency, the patient is required to devote some time to calisthenics; to practice control of the breath in singing, reading, and speaking; and to make frequent use of the "octave-twist" which will be described presently. Scripture says,—“The abnormality in breathing usually disappears when the stutterer speaks with the octave-twist. (S. & L., p. 85.)

The stutter-voice, being caused by laryngeal cramps, is characterized by the monotonous laryngeal tone which we are assured is *present in every case of stuttering*. “For when the muscles cannot have free action, the vocal-cords in vibrating must produce hard, unmusical tones.” To correct this there are many fine melody-exercises where words and sentences are sung or spoken with every possible variation of pitch. The “octave-twist” is recommended, in particular, for flexibility.

In the octave-twist the laryngeal tone passes over an octave while the first important vowel of a word is being given. In doing this the voice changes from the *chest*-register to the *head*-register; this exercise forces the patient to make a new adjustment of the vocal-cords, thus relaxing the muscles. Scripture cautions that it will not be easy and the patient will probably fall short, going only from C to G—but unless he reaches the full octave there will be no benefit. (See p. 79, S. & L.) This is doubtless an excellent exercise; the patient cannot help feeling very self-conscious, however, and imagining himself an object of ridicule.

There are numerous exercises for general indistinctness and for expression. The use of the *breath-indicator* is a help toward securing perfect enunciation. The lips, the tongue, the jaw, all must be relieved of muscular tension, so directions are given for that. In reading there is the familiar linking of words and lengthening of the first vowel, or else giving it with the octave-twist.

After the patient is able to repeat anything said by the instructor, and to read well with him, *then* spontaneous speech and self-confidence are to be developed. Scenes-from-life form part of the play that is nevertheless work for the stutterer. He takes the different rôles in turn. There is no lack of variety, though he may have a hard time. Question and answer, descriptions and narrations, also reading alone—these things foster independence and a degree of self-assertion hitherto foreign to his shrinking self. Scripture thinks that

the boldness or indifference exhibited by some stutterers is only a kind of bravado to cover up timidity.

Soon the patient is obliged to show what he can do before other people. He plays store, sells tickets, introduces people to each other, plays games, recites poems, delivers speeches, etc. A strong, commanding voice is cultivated by shouting, by speaking through a megaphone, or by the use of a private telephone.

Not a few stutterers are lively beyond bounds. Such children need to be suppressed, to be shown how to control themselves. They speak with too great haste. They must be required to speak slowly—in time to the metronome, or to the beating of sticks. Reading with prolonged vowels is good practice for these excited, over-impulsive patients. Above all things they must learn to keep *silence*—not to interrupt other people when they are talking, and not to take more than a fair share of the conversation.

In contrast to these emotional *jumping Jacks* come the representatives of the other extreme of feeling. These patients are shy, timid, ashamed or afraid to speak—and many of them are tearful and depressed. In cases of this kind the first essential to cure is a hopeful and cheerful frame of mind. Encouragement must be given even up to the breaking-point of truth—but not beyond, never beyond, lest confidence break also.

Throughout the treatment one thing should go along parallel with all the other efforts. The stutterer's habits of thought must be changed. It is quite apparent that his mental action is abnormal most of the time. The least excitement throws him into a state of confusion. When asked a question, he simply cannot think. He cannot concentrate his mind upon anything. He does not know what he wants to say. His hesitating thought makes hesitating speech. By degrees, however, it is possible, at the cost of infinite patience, to alter this. A stutterer can be trained to observe carefully, describe accurately, think quickly, decide promptly, keep to the subject chosen, and to be sure of what he knows. It is not necessary to enter into details as to how this is accomplished; but one exercise in association-of-ideas is of interest as leading up to the "Jung Association Test." The exercise is given "to quicken mental processes" and help the stutterer to go directly to the point every time. The first call is for simple association. Ex.—Flower, rose. The next step is association in a series. Ex.—Garden, flowers, seeds, roots, earth, etc. The third request is for association of part to whole. Ex.—Lumber, house,—or from whole to part—Ex.—Room, floor.

From words suggesting other words—under partial control, as one might say, it is a near matter to let the patient take “a starter” and move along as inclined. These running associations are eagerly followed in the hope of obtaining clues to the life-mysteries which influence conduct. The final but ever-present purpose is to modify or to remove peculiarities of character very obvious to the family and friends of the stutterer. This real education deals with his repressed natural instincts, with his emotional history from *babyhood*, with his conscious and his unconscious aims, with his attitude toward other people and toward himself, with his fancies, and with his dreams. In their interpretation the subconscious region of the mind is explored; and a new map of the divided country is laid out for the edification of the ego. As psycho-analytic patients will testify—after such a view of the land, we not only “see ourselves as others see us,” but we see everything within ourselves; and that what we accuse others of being, *that* is largely what we are.

Revelations so wonderful as to be almost incredible must “make a new man” of the patient, if there is anything left when these labors are ended. At any rate whether there be much or little, he may make a new beginning with what he has. He may pluck up courage and go forward relieved of his burden. He always could sing; and now it will be the praises of psycho-analysis.

THE OPTIMUM TEMPERATURE FOR MENTAL WORK

By WILLIAM H. BURNHAM

A suitable temperature is absolutely essential for the life of the human organism. If our bodies are subjected to too low a temperature for a long period without protection, the nervous system shows symptoms of paralysis, and finally death ensues. If the body is exposed to a high temperature for a long time, especially with great humidity, which hinders the evaporation from the skin and the cooling off by this means, then the body temperature rises and serious nervous symptoms may appear, at first a feeling of discomfort and sleepiness, and finally heatstroke.

The body is usually kept in a temperature of about 90° F. by the clothing that we wear. That is, the temperature of the surrounding air under our clothing is about 90°. This is a tropical temperature, and we regulate this as we go toward the tropics by wearing less clothing; as we go toward the arctic regions, by wearing more clothing. With the usual metabolism and this covering of clothing more heat is produced than the body needs. Thus it is a matter of vital concern to the welfare of the organism to eliminate the superfluous heat. An elaborate and wonderful mechanism exists for this purpose. Nature's method is in part as follows: First of all in an overheated atmosphere the tendency is for one to stretch out the limbs and take a bodily posture that will expose the maximum surface to the air. A special nerve center rushes the blood to the surface of the body so that it can be cooled off by contact with the external air, the blood being at a temperature usually less than that of the surrounding atmosphere. Again, if the heat is extreme, perspiration occurs, and still further heat is thrown off by the elimination of moisture from the lungs. The success or failure of the body in accomplishing this purpose depends quite as much on the humidity of the external air as on its temperature. The relation of humidity to bodily comfort, however, although an essential part of the problem of temperature is another story which cannot be told in the present paper.

The well-accepted view is that the body temperature remains constant at 98 6-10° F. or 37° Cent. This, however,

is only an extremely rough statement of what is true of the interior of the body, perhaps on an average at certain times in the day; but the variations at different times of the day, and with different individuals, and with the same individual on different days, are great. These conditions should be considered somewhat especially.

1. The body temperature fluctuates through a considerable range during the day, the minimum temperature being at night and in the early morning hours, and the maximum temperature early in the afternoon. This is well illustrated by experiments made by Benedict and Carpenter (3). They and other observers found a range of variation during the 24 hours of several degrees Fahrenheit. They found the minimum from 3 to 5 in the morning, a marked rise at about 7 o'clock, a slow steady rise during the daytime, reaching the highest point in the afternoon between 3 and 6, then an evening fall with marked falling temperature after going to bed, the minimum being reached again between 3 and 5 in the morning. Thus it becomes important to know the normal physiological facts for each individual. This is apparently independent in large degree of the activity of the subjects. Polimanti (28) studied the body temperature of individuals who worked at night and slept in the daytime, and he found that in spite of their night work there was a similar fall in the body temperature during the night. Apparently, if we may trust these investigations, this change of body temperature represents an old biological rhythm which is determined by something deeper than the alternating activity of sleeping and waking hours.

2. Again there is a considerable range of variation of the body temperature from one day to another. With one of Benedict's subjects the range varied from 1.27° C., 2.29 F. on the first day to .93° C., 1.67 F., on the second day. Similar variations in the fluctuations from day to day were observed with other subjects.

3. Two individuals may differ considerably in regard to their average body temperature. The standard taken as the average, namely, 98.6, Benedict and Carpenter estimate as too high. The body temperature throughout the day seldom averages as high as this. Most physicians take the sublingual temperature, and that is usually too high.

4. The body temperature varies to an appreciable extent with variations in the surrounding temperature. The New York Commission (22) found that the temperature of the subjects studied at 8 in the morning, living in their own homes, was conditioned by the average atmospheric tempera-

ture of the preceding night. If the night had been warm, the body temperature in the morning was high; if cool, the body temperature was low. The variation amounted to about 1° F. for 20° of atmospheric temperature, although probably the variation was modified by clothing.

"The commission further found (22, p. 185) that, whatever the bodily temperature of its subjects might be at the beginning of an experiment, it was lowered by confinement in an atmosphere of 20° C. (68° F.) and 50 per cent. relative humidity, and raised by confinement at 23.9° C. (75° F.) with the same humidity, or still more by 30° C. (86° F.) with 80 per cent. humidity. The final average bodily temperatures in certain series of observations, where the subjects were confined in the observation chamber for from 4 to 7 hours, were as follows:

"After 20° C. (68° F.), 50 per cent. humidity, the average bodily temperature was 36.7° C. (98° F.).

"After 23.9° C. (75° F.), 50 per cent. humidity, the average bodily temperature was 36.9° C. (98.5° F.).

"After 30° C. (86° F.), 80 per cent. humidity, the average bodily temperature was 37.4° C. (99.3° F.)."

With an increase in the external temperature there is likely to be a rise in the body temperature, and this is accompanied by an increase in metabolism. Up to a certain optimum this increases the activity and efficiency of the organism. Beyond that, the increase in metabolism caused by increase in temperature brings about a condition where the oxidation and elimination processes are not sufficient to carry off the waste products with the necessary rapidity, toxic products accumulate, and thus fatigue comes quickly.

Recent studies indicate that the cause of heat stroke and sunstroke is an abnormal change in metabolism. There is apparently not merely a more rapid breaking down of tissue, but the effect of the toxic products produced is greater. Many experimental investigations indicate this. Patrizi (21) found that human muscles subjected to hot baths are quickly fatigued. Gad and Heymans (21) found that the excised muscles of frogs are rapidly fatigued when kept warm. In fevers resulting from bacterial infection one of the metabolic changes is an increased excretion of nitrogen, due, it is thought, to an increased destruction of the proteins of the tissues, probably caused largely by the direct action of the higher temperature upon them. A similar destruction of proteins is thought to occur as a result of hot baths, and the like. It seems probable also that in the overheating that results from exposure to a hot and humid atmosphere there

are likewise disturbances of metabolism. Different investigators have found that when the temperature of the body has been raised either experimentally, or otherwise, the alkalinity and coagulability of the blood may be diminished.

Again it seems to be a recognized law that poisons are more intense in their action the higher the temperature. Dr. Lee (21) has applied this law to the action of fatigue toxins in the body.

"There seems to be no reason," he says (21, p. 509), "why this law should not apply to the case under consideration. This suggestion has indeed been made for normal fatigue substances by Patrizi to explain the ready fatigueability of human muscles submitted to localized hot baths. With even greater weight it can be applied to the human being laboring under the disadvantageous conditions of excessive temperature and excessive humidity. Normal and pathological fatigue substances are here present in solution in an overheated body. If they are toxic at normal degrees of temperature, their toxicity is more pronounced at higher degrees, and in proportion as mechanical work is performed and internal temperature rises, the more is working power lessened."

The external temperature has a definite effect also on the rate of the heart beat. "The New York Commission found the average rate of its subjects confined in an atmosphere of 30° C. (86° F.) and 80 per cent. relative humidity to be 74, and in an atmosphere of 20° C. (68° F.) and 50 per cent. humidity to be 66. Eastman and I have seen the pulse rate increase by 39—from 67 to 106—as the temperature of the air surrounding the subject rose from 23.3° to 43.3° C. (74° to 110° F.) and the humidity from 50 to 90 per cent." (22, p. 185).

One fact is clearly established. For comfort, for efficient activity either physical or mental, for the preservation of life itself, it is necessary to eliminate the superfluous heat from the body. Whenever this is interfered with by improper clothing or by confining an individual in a small space without ventilation, accumulation of heat in the body, or *Wärme-stauung*, as the Germans call it, occurs. This fact gives us the prime reason for ventilation. It is necessary first of all to ventilate rooms, not because of the excess of CO₂ that is found where individuals are confined in an enclosed space, not on account of the lack of oxygen, not primarily because of any organic poison, the so-called anthropotoxin of Du Bois-Reymond, but first of all to enable the occupants of a room to eliminate the superfluous heat from their bodies. This has been made emphatic by recent investigations.

Especially noteworthy are the experiments of Paul (25 and 27) in Flügge's laboratory in Breslau. Paul shut himself up in a glass cabinet just large enough for his body and a few simple instruments, and he breathed the same air over and over until it contained more CO₂ than would be found in the worst schoolrooms or theatres; but he could remain in this glass case without discomfort for over four hours, provided the temperature was not above 60° and the humidity not more than 72% of saturation. On the other hand when the temperature was raised to between 68° and 86° and the humidity was between 72% and 92% serious symptoms appeared in 15 minutes. He measured the surface temperature of his body and found that with this increase in the temperature of the air the temperature of his body had increased; and when it was raised 3 degrees, he felt a pressure like a band across his forehead, he suffered headache, vertigo, and nausea, and was on the verge of fainting.

That these symptoms were not due to lack of oxygen, or to "breath poison", or the like, was shown also by the fact that when the temperature had increased to 70° he put his head out of the cabinet, but it did him no good; and a man outside put his head into the cabinet, but it did him no harm. The danger comes largely from the storing of heat in the body. On the same principle it is said that if you sew a cat's head into a football, she will be none the worse for it; put her body into the football and leave her head outside and she will have a fit. (25)

The cases of fainting in public assemblies are instructive. Why, asks Dr. Northrup, (25) does a woman faint in the second or third act of a play and not in the first or fourth? His answer is that "when she goes into the theater the air is not surcharged with moisture. She is not overheated. She does not faint in the last act because people have complained and have secured a change of air. In the second or third act there is bad air." If in addition to the heated air of a crowded room one has the additional heat that comes from extra clothing, the condition is of course still worse. The following case reported recently in a Boston daily paper is a typical one. It was the case of a young man twenty years old attending a political rally. The report in the daily paper was as follows: "Quinlan, clad in a heavy overcoat, attended a rally at the Vine Street Church in the interest of John F. Fitzgerald. The crowd was wedged together closely, and the young man became faint. He was removed to the open. A doctor was summoned and pronounced Quinlan overcome by the heat."

If too high a temperature is combined with stagnant, impure air, the brain simply refuses to function.

A number of writers since Paul's investigations, Benedict, Hough, and Gulick and others in this country, and Reichenbach in Germany, have laid the chief emphasis on the temperature in relation to ventilation. According to their view the chief aim of ventilation is to keep the temperature within normal limits. At all events this is the primary aim. It is desirable, of course, to remove bad odors and excess of moisture, and the like; but if we keep the temperature and humidity within the proper limits there is apt to be little trouble with anything else.

In the words of the Ventilation Commission "the thermometer is the first essential in estimating the success of ventilation." (34, p. 631.)

As pointed out by Professor Hough (16) lack of suitable conditions for regulating the temperature of the body affects unfavorably the occupants of closed rooms, and any efforts at ventilation which neglect this primary problem are sure to fail, and those that provide for it are sure to be measurably successful.

There appears to be an optimum temperature for the activities of all organisms, for the human organism as well as for that of plants and animals. Dr. Huntington (17) has presented curves showing this optimum for the activities of lower organisms as well as of man, and it is noteworthy that the higher the organism the lower the optimum temperature.

Huntington's curves show approximate temperature optima for mental energy in human beings at about 40° F.; for mental and physical energy combined at 50° F.; for physical energy at 60° F.; for the absorption of oxygen by crayfish at 74 or 75° F.; for the rate of fission of infusoria at 83° F.; for the growth of plants at 85° or 86° F.

The question whether the temperature of the body itself has any appreciable influence on the ability to do mental work and whether or not the temperature is correlated with the degree of intelligence has been a problem; but recent studies in Karl Pearson's laboratory indicate that there is no correlation between the physiological temperature, the respiration, pulse, and other physiological variates, and the mental character. Two studies have been made, one of the oral temperatures in school children, and one of criminals. Miss Whiting, who made the latter study, found that the general physical condition has little relation to the physiological variates. She sums up her conclusions in part as follows:

"In a person, not ill enough for hospital treatment, tem-

perature, pulse, and respiration would hardly be a differential measure of general health, much less of the goodness or badness of the physique in general. It is true that the person in good health has a rather higher temperature and rather lower pulse-rate than one in poor or indifferent health. But there is no significant difference in respiration and the correlations are so low that not only no rough measures of temperature and pulse would aid diagnosis, but really fine numerical determinations would not be of any discriminating value. In capacity for hard labour the pulse plays no part, but it is associated with a slightly higher temperature and a slightly slower respiration. Muscularity is associated with higher temperature, slower pulse and slower respiration. Fatness with higher respiration and pulse, but has no apparent relation to temperature. Height and weight also have no sensible relation to temperature, the larger men have a slower respiration, but the effect of tallness is to slacken pulse, of greater weight to quicken it. Pulse and respiration quicken with age, but temperature falls. In every case, however, these associations are so small that they would be incapable of appreciation except as the mean results of large numbers of accurate records. For ordinary every day experience we can only conclude that nothing can be judged from the physiological variates of physique or from physique of the physiological variates." (32, p. 16.)

Miss Whiting sums up also as follows the investigation of school children by Williams, Bell and Pearson. (33) "It was shown that in a series of seven schools temperature was negatively correlated with weight for constant age, and further in six out of the seven school series negatively correlated with stature for constant age. The correlations were on the whole small, but definitely significant. In the great public schools the temperature appeared, allowing for age, to be lower than in the elementary schools. An association was thus suggested between intelligence and temperature, the more intelligent having the lower temperature. This result might well be considered as spurious, and due to differences of nature, particularly to differences of nutrition. On the other hand various writers have asserted that low temperatures are associated with low intelligence, and it is usually stated that the temperature of idiots is lower than that of normals."

Apparently, however, there is an optimum temperature for brain activity as well as for other physical activities. The writers in Richet's dictionary (2) think it certain that the activity of the brain and the medulla is affected when the temperature of the body rises or sinks. According to what

has been observed in men and animals affected with severe heat or cold, the suppression of function of the different parts of the central nervous system follows in general the following order: first, the intellectual faculties; second, voluntary movements; third, sensibility; fourth, motility; fifth, the innervation of the vegetative life. Important variations in the irritability of the nerve cells follow the same sequence.

As pointed out by Fröhlich (8) a series of factors are responsible for the injury to the nervous system by overheating the body; among these is a decrease of the amount of water in the blood, and an increase of the mineral salts. This condition increases the irritability of the nervous system, and with this the intensity of the metabolic processes. If we add to this, mental or physical work, then the oxygen supply is not adequate. The nervous system is so strongly affected that it loses its functional ability very rapidly. And Lee (22) points out that "the rise of external temperature by dilating the cutaneous blood vessels makes the brain anaemic, but it is not certain that variations in such temperature with or without variation in humidity markedly affect the action of the nerve tissues unless the variations are excessive."

There are of course great individual differences as regards the effects of temperature; here as everywhere a psychic factor must be reckoned with; and many conditions cooperate in determining what is called the "sensible temperature." This has been studied and discussed by a number of writers. According to Cleveland Abbe, (1) "the sensation of temperature depend on the temperature of the air, its dryness, the velocity of the wind, and the suddenness of atmospheric changes, all combined with the physiological condition of the observer. A complete expression of sensible temperature has not yet been obtained."

This so-called sensible temperature probably depends largely on the peripheral stimulation. And, as Dr. Gulick (10) has pointed out, there may be an advantage in changes of temperature within certain limits. To quote his words:

"It is an important fact, then, that man has never existed in an environment having a stable temperature. The changes of day and night, of sun and cloud, of wind and rain, of summer and winter have been productive of constant change in the temperature. Although man has engaged himself in guarding himself against such changes as are too great for comfort or health, by seeking or avoiding sunlight, utilizing the coolness of water, the protection of clothing, creating defenses against hot or cold winds, still, till the invention of the thermostat, such efforts mitigated the extremes of temperature rather than did away with change itself. Change in

temperature within certain general limitations seems to be one of the fundamental general facts about man's environment."

These limits, however, are pretty narrow, and outside of these limits it is not only true that danger to health soon comes; but there is probably an optimum for efficient brain activity. Recalling that excess of heat affects the brain centers first, it would seem probable that while extreme heat destroys one's ability to think, any increase in temperature above the optimum for the given individual would tend to decrease the amount of work done. We know relatively little about this, and individual variations are probably great, some persons being able to work at their best at a higher temperature than others. Unfortunately we have no studies which show the optimum doses of temperature for different kinds of work in case of different individuals. While the experimental evidence is somewhat conflicting, apparently there is such an optimum for each individual, and perhaps for different kinds of mental work.

Schuyten, (29) who studied (by a crude method to be sure, i. e., the apparent ability to keep attention fixed on a school task in reading) the attention of school children in the schools of Antwerp for a whole academic year, found that the number of inattentive children stood in direct relation to the mean temperature, of Central Europe, the greatest number being in the hot summer months.

Huntington (17) also in his study of the work done by factory operatives in Connecticut found an annual course of production, low at the beginning of the year and falling still lower until the end of January, with a gradual increase throughout the spring until June, and a moderate decrease until the end of July. An increase in the autumn to a maximum in November, and then a winter decrease to the minimum in January. That is, production was greatest in the spring and autumn and at a minimum in winter and summer. A similar result was found among the workers in making electrical apparatus in Pittsburgh, and also by industrial workers in the southern states.

These results which seem to indicate an optimum temperature for industrial workers, not in the summer or in the winter, was corroborated by a study of the marks of students at West Point and Annapolis in certain classes, especially in mathematics. Huntington concludes that the optimum temperature of the outside air for physical work is about 60° F.; for mental work, about 40° F.

Some studies having a bearing on the effect of the temperature in general upon school work have been made.

Dexter (7) found that a high temperature diminished the

number of bad marks given both in schools in New York City and Denver, but he did not make any special study of the amount of work done. "High temperatures, as recorded at the Weather Bureau, did not increase, but rather diminished the number of bad marks given, both in the schools of New York City and Denver. The largest excesses of demerits (twenty per cent) were for temperatures between 45 and 60 degrees (mean), falling to fifty per cent less than normal for those between 80 and 90 degrees." (7, p. 547.)

His studies indicate the advantage of a low temperature for the discipline of the school, although excessive temperature also had a quieting effect. He describes a control investigation as follows:

"As a supplementary study, the deportment was referred to the temperature of the school room itself, which is observed and recorded by the teacher in each of the New York City Schools at three stated intervals during each day's session. The recorded temperatures of the different rooms varied from 60 to 80 degrees Fahr. Within these limits, those below 68 degrees were accompanied by less misdemeanors than the normal, hence may be interpreted as quieting in effect; those from 69 to 73 degrees showed about the normal, while, the highest temperatures recorded were accompanied by deficiency of disorder, twenty per cent less than the normal being recorded for a school room temperature of 79 degrees. This decrease of active disorder for conditions of most excessive heat was shown to a marked degree in a study of assault, suicide, and discipline in the penitentiary made in a manner similar to this, and without question is but a result of the physical lassitude which every one feels under such temperature, and is chronic with the inhabitants of the Torrid Zone."

A few investigations have been made to determine the effect of different degrees of temperature in the school-room on the working ability of the children. Observations were made a few years ago in three schoolrooms where sixth grade pupils studied in Crawfordsville, Indiana. Supt. Hines (13) reports the following notes in regard to the effects of different temperatures.

Temperature of 80 degrees, the class was restless, dull and incapable of continued mental effort; 76 degrees, the class was dull and sleepy, penmanship was poor; 75 degrees, class was dull and complained of the heat; 74 degrees, not quite so dull as above; 72 degrees, restless; 70 degrees, excellent work, cheerfulness in class; 68 degrees, best work, to-day seemed their best; 66 degrees, splendid work; 65 degrees, class happy and full of work, some complained about the

room's being cold; 60 degrees, too cold for good work, complained of the cold.

Tests were also made which although crude indicate the general advantage of a lower temperature than what is usual in the schools. The first is reported as follows (13, p. 110):

On the first day of the test, one room was held for an hour at a temperature of 80 degrees, the second at 75 degrees, and the third at 70 degrees. At the end of the hour a list of words for written spelling was given to each set of pupils, the same list in all three rooms. The average of the class on this list in the room at 80 degrees was 58.8; 75 degrees, 77; 70 degrees, 78.2. The cooler the room, the better the average. The difference here between 70 and 80 degrees in temperature caused a difference in scholarship average of 20 per cent.

Similar tests on succeeding days with the same temperature in each of the different rooms gave about the same averages, so that the varying results in the first day's test seem to be fairly attributed to the differences in temperature.

Another interesting test is reported as follows (13, p. 112): Another test of the effect of temperature was made in three third grade rooms. One of these rooms, because of a defective heating apparatus which failed to do the work required and was therefore being rebuilt, had for the period of about eight weeks a temperature averaging 66 degrees. One of the other two rooms had an average temperature of 70 degrees, and the third one about 71 degrees. Toward the close of this period, tests in arithmetic and English were given. The pupils in the coolest room received the best grades in both cases. There had been times when the one room was too cold for good work, but there never had been a time when the brains of the children were dulled because of the excessive heat. The children of the other rooms were listless at times because of the heat. During a good part of this time the pupils in the cool room attended only a half day while the others attended all day. In spite of (or on account of) the half day attendance, the pupils in the cool room excelled those in the hot rooms who attended all day.

Lehmann and Pedersen (23) have come to closer quarters with the problem by experimental methods. They made tests of their subjects' ability to add each morning either directly before or after dynamometric tests, adding seven columns of fifty one-place numbers. The dependence of the rapidity of adding on the strength of the light or of the air pressure was not shown; but of all the external factors temperature was the one that did have a demonstrable influence. All such factors, as the food taken, the work done the preceding day,

the sleep, and so on, did have a greater influence on adding than on the muscular strength, but none of these seemed to have any such influence as the temperature. There appeared to be distinctly an optimum temperature for the best performance in adding; with a lower temperature or higher temperature less work could be done in a given time, or more strictly, the amount added in a given time was decreased.

Their studies indicate that the different mental functions are differently affected by the different factors in the weather. Memory performance seems to be dependent upon light, temperature, and atmospheric pressure; but as regards the process of adding they found only a dependence on the temperature. The results show that the rapidity in adding is influenced neither by the intensity of light nor by the smaller or larger or shorter or longer continuing variations in air pressure. On the other hand, it is dependent on the temperature, in such a way that it increases if the temperature approaches a certain optimum varying for the individual and it sinks when the temperature varies from the optimum.

Their investigations of the muscular strength in relation to the temperature are also significant. They found that there was an optimum temperature for the muscular strength, this optimum varying with the individual. This optimum temperature for the muscular strength is higher than for the mental work of adding. Both higher as well as lower temperatures decrease one's strength. There is a yearly periodic variation. In January in spite of the low temperature the muscular strength begins to increase with the intensity of the light, and this increase continues until the high temperature of the summer months in June to August brings about a standstill. With the sinking of the temperature in September the muscular strength begins to increase again; and at the beginning of November, finally, on account of the decrease of the intensity of the light and the decrease of the temperature, the increase is checked or a decrease occurs.

It is especially interesting that the optimum temperature for adding is much lower than it is for muscular strength. Why a lower temperature should be more favorable for adding than for muscular strength is not known, but the fact seems to be established by Lehmann and Pedersen's experiments.

The most serious attempt at investigating the effect of temperature conditions on intellectual workers in this country has been made by the New York State Commission on ventilation in their laboratories at the College of the City of New York during the past few years (22, 26, 30, 34). The

observations were based on nearly one hundred individuals for continuous periods of one to six weeks, from four to eight hours daily. From the report of their results made about a year and a half ago the effects of changes of temperature seem to be as follows:

Temperature they found exerts a marked influence on comfort. Temperature affects markedly certain physiological reactions, but within the range of from 68-86° F., the Commission did not find that it effects the ability to do mental work. It did, however, influence the attractiveness of the mental tasks.

The usual psychological tests were conducted by Thorndike (30); and in neither the young men or the young women who served as subjects could there be found any relation between the atmospheric conditions and the amount of mental work done. Further experiments have been made, but no complete report is at hand.

The results of Lehmann and Pedersen obtained in the laboratory, those found by Huntington in factories, and by the New York Commission, as well as the results of other investigations seem to indicate pretty clearly that the temperature is the most important of the different climatic factors in its influence upon human activity.

If we attempt to analyze the effects of temperature on brain work, apparently temporary conditions of overheating do not greatly incapacitate the person for the normal amount of work, but cause such discomfort and distraction of attention that the amount of work is decreased. For practical purposes this effect is as significant as if it were caused by the direct effect of the higher temperature on the brain.

The contradiction between the results found by Lehmann and Pedersen and those found by the New York Commission are apparently easily explained. The New York Commission found that when the subjects were allowed to work as they pleased their work fell off in the higher temperature, and they showed a distinct disinclination to work. Their subjects were, as I understand, paid for their services and pledged to work as rapidly as possible. Consequently they usually worked hard in spite of the uncomfortable temperature, while the subjects of Lehmann and Pedersen and the children in the schools studied by Huntington were under no such stimulus to work as hard as possible, and consequently gave up to their feelings, as we may assume, and hence accomplished less. The latter condition is that likely to be found among ordinary workers, and especially among school children.

It should be noted that investigations indicate that the younger the child the more susceptible the organism to changes in the temperature of the surrounding air. The child responds more quickly to increase in temperature or decrease in temperature; and while within certain limits the child's body can equalize changes in temperature more readily than that of the adult, outside these limits the child is more affected than the adult. The reasons for this greater susceptibility of the child to changes in temperature are in part obvious. They depend on the smallness of the child's body.

On account of the smallness of the child's body the reflex arcs are shorter and the vital processes go on more rapidly. The heart beat and respiration, for example, are much more rapid in the child than in the adult; hence heat is more rapidly produced in the child's organism. The effect of this is seen in the high degree of fever likely to be caused by even a slight disturbance in case of the child. On the other hand, on account of the smallness of the child's body and the relatively greater surface of the child's body as compared with its weight, heat is given off from the body much more rapidly in the child. These two factors, the shorter reflex arcs, conditioning relatively greater production of heat in the child and the relatively large surface of the child's body making the elimination of heat more rapid, in large part account for the greater susceptibility of the child to changes of temperature. Children frequently suffer greatly from too large an amount of clothing, especially children on the cars and the like, where the heat is extreme, and parents do not take the trouble to remove the outside wraps that the children wear.

The practical problem of the best temperature for a schoolroom should receive attention. Custom varies. In English schools probably the temperature is usually kept between 60 and 65° Fahrenheit; in this country it varies usually between 65° and 80°. From observation it is probably safe to say that most American schoolrooms are over-heated. Recent observations and tests in the schoolroom emphasize this. Hines (14) had reports from schools in different parts of this country, and he found:

"The temperatures recorded ranged from 60 to 76 degrees Fahrenheit. The temperatures were taken down as shown by the thermometers in use in the schoolrooms. In all too many cases the schoolroom thermometer was cheap and inaccurate. One room was at 60 degrees, two at 64, ten at 66, thirteen at 67, three at 73, one at 75, and ten at 76 degrees. The great majority of rooms in which temperatures were taken, one hundred and forty-four, showed temperatures rang-

ing from 68 to 72, with most of these at 70, which seems to be accepted standard temperatures for the American schoolroom where any attempt is made to regulate carefully the amount of heat in the room. A lower temperature would doubtless be better for all concerned."

In New York schools Winslow (35, p. 226) reports: "We found schools in which the temperature in one school day ranged from 53° to 81°; schools in which a third of all the records obtained were over 71°; schools in which the temperature for several successive days was almost constantly between 75° and 80°."

In some parts of the country many rural schools have no thermometers. In 1912 Dr. Dresslar (14, p. 12) reported that of 1,296 typical schools scattered over nineteen states two-thirds had no thermometers, and in the remaining one-third it was clear that many teachers knew next to nothing about keeping the schoolroom at a proper temperature, or else the conditions were such that they could not maintain an even temperature.

We may perhaps conclude with Supt. Hines that with the right condition of humidity 68° is the proper temperature for a schoolroom. The practice in certain large cities is in accord with this standard. According to official regulations, the schoolroom temperature in Chicago and New York should be 68° instead of 70° as formerly. Tests in English schools (14) indicate that the best work can be done with a temperature in the sixties; and the outdoor schools bid fair to furnish evidence that the optimum temperature for school work is not above 60°. At present, for indoor schools 68° may well be taken as the maximum limit.

In many cases the overheating is a serious handicap upon school work. A case reported to me recently, by an intelligent school visitor was, as I recall it, in substance as follows: Both the teacher and the children had become nervous, school exercises went awry, the discipline and morale were failing, the school work both to the teacher and pupils was of little or no value from an academic point of view, but distinctly injurious from the point of view of hygiene. The teacher seemed to be a good one. The cause of the trouble was obviously the high temperature of the room, 75 or more. This is merely a typical case. What is needed in such schoolrooms is not better discipline or more efficient methods, but chiefly a mere reduction of the schoolroom temperature. The condition of the ordinary schoolroom in this part of the country as regards temperature, not to mention minor matters such as school dust, bad odors, and the like, is often unpar-

able. The one reform which perhaps more than any other, except possibly greater cleanliness, is obviously needed in our schoolrooms, is a lower temperature. And when we reflect that decreasing the heat would not only increase the efficiency of the school work but decrease the money paid by the taxpayers, the question why this reform is not brought about remains one of the puzzles of school hygiene, and can be accounted for psychologically only on the basis of the force of custom and the power of the law of inertia. It is, however, a difficult thing to obtain a suitable temperature in a schoolroom. In the first place, it is very difficult to arrange the system of heating and ventilating so that excess of temperature can be avoided. In the second place, lack of proper humidity makes children feel chilly even in a room with high temperature. Again, the carelessness and lack of hygienic apperception on the part of teachers is such that they often work in a room with excess of temperature without realizing it. And finally, and sometimes worst of all is the ignorance and inertia of janitors.

The report has come to me of a janitor in a rural district who complained that he could keep the school room at the proper temperature all right if the teachers did not keep moving the thermometers about. In spite of all difficulties, however, the teacher should keep watch of the temperature, and if unable to regulate it herself report to the janitor or principal. If the overheating is not remedied, the teacher should report again, and keep reporting and protesting until that janitor, although he fear not God nor regard hygiene, may be wearied with her continual coming.

The following significant results seem to be established by the investigations thus far.

(1) The body temperature in a condition of health is approximately 98° F., although with slight individual variations.

(2) The body temperature varies rhythmically during the day, being lowest in the early morning, perhaps from 2 to 5, and increasing during the day and reaching its maximum in the afternoon, perhaps between 3 and 6, with a fall at night.

(3) The body temperature varies also with the external temperature and with the clothing. The New York Commission for example, found that the morning temperature was in a considerable degree determined by the temperature of the preceding night, and that the temperature was lowered by confinement in an atmosphere of 68° F. and 50% relative humidity, and raised by confinement in an atmosphere of 75° F., and still more with an atmosphere of 86° F. with 80% humidity.

(4) No considerable variation from the normal temperature can occur without serious results. It is vitally essential for the welfare of the organism to eliminate superfluous heat.

(5) There is apparently an optimum temperature for all forms of activity, whether in lower organisms, animals, or man. For physical activity in man this is perhaps a temperature of outdoor air of 60° F.

(6) There seems to be an optimum temperature for mental activity; this perhaps for the outdoor air, 40° F.

(7) The optimum temperature is different for different kinds of activity. The higher the organism the lower seems to be the optimum. The higher the form of activity, the lower apparently the optimum. The optimum for adding, for example, is distinctly lower than for muscular activity.

(8) With a temperature below the optimum the metabolism is not sufficient for the most efficient activity.

(9) With a temperature above the optimum the activity increases to such a degree that the organism is not capable of carrying on the necessary oxidation processes and of removing the waste products from the body with sufficient rapidity. These waste products act as poisons and diminish the activity, and fatigue quickly occurs.

(10) The temperature seems to be the most important climatic factor in its influence upon comfort and activity both physical and mental.

(11) Change from a high temperature to an atmosphere considerably colder, tends to render the organism susceptible to infection, as indicated by experiments upon rabbits.

(12) The primary purpose of ventilation is to maintain an optimum temperature.

(13) Considering the condition as regards temperature in most American homes, the optimum temperature for a schoolroom seems to be about 68° F., with a relative humidity of about 50 per cent.

(14) The regulation of temperature is the most important condition for intellectual workers whether in the schoolroom or elsewhere. In many schools probably no condition is so injurious as the excess of temperature that usually occurs, and no schoolroom reform would do so much for comfort and efficiency and health as care to keep schoolrooms continuously at an optimum temperature.

(15) While, as indicated by the investigations of the New York Commission, under laboratory conditions, excess of temperature may not specially diminish the amount of mental work done, under schoolroom conditions the discomfort caused is likely to have a marked effect.

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SCORE-CARD FOR RATING STUDENT-TEACHERS IN TRAINING AND PRACTICE

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The purposes for making a score-card for rating student-teachers in training and practice are as follows:

1. An analysis is presented of the qualities necessary for successful teaching and of the relation of these qualities to one another.

2. In the hands of student-teachers this analysis will tend to promote self-criticism and self-improvement.

3. In the hands of critic teachers this analysis will tend to promote their comprehensiveness of judgment in rating students' teaching efficiency.

4. This outline may be used by critic teachers as a score-card for rating student-teachers in such a manner as to give a reasonable proportion of credit to each of the fundamental qualities.

5. These ratings should designate points of strength and weakness in the student-teacher and should therefore prove valuable in guiding the principal, the supervisor, and the critic in their constructive work with the student-teacher.

6. The records on the score-card may be used as a basis for recommending graduates for appointments.

The qualities of merit enumerated on the score-card are organized about four main topics:

- I. Preparation.
- II. Teaching Skill.
- III. Classroom Management.
- IV. Personality.

These topics were adopted after inspecting the studies of Boyce,¹ Miss Moses,² Ruediger and Strayer,³ Boyce,⁴ Littler,⁵

¹ Qualities of Merit in Secondary School Teachers. *Journal of Educational Psychology*, March, 1912.

² Causes of Failures Among High School Teachers. *School and Home Education*, January, 1914.

³ Qualities of Merit in Teachers. *Journal of Educational Psychology*, May, 1910.

⁴ Methods for Measuring Teacher's Efficiency. *Fourteenth Year-book of the National Society for the Study of Education*, Pt. 2, pages 11-20; 42-76.

⁵ Causes of Failures Among Elementary School Teachers. *School and Home Education*, March, 1914.

Buellesfield,⁶ Elliott.⁷ It is not possible to determine, with mathematical accuracy, the importance of the topics used in these different studies: first, because of the various meanings given to the different terms by different authorities; and second, because of the length of the lists of topics in several of the studies. It is interesting, however, to note that the topics commonly used in each of the above studies were, with but one exception, the qualities enumerated above. I therefore decided upon the use of these four topics and have organized about them the other topics given in Table I.

Though the studies just mentioned were helpful in deriving sub-topics for each of the main headings decided upon, the most valuable means of obtaining these same sub-topics was a study of the preliminary reports made upon student-teachers in practice by critic teachers or general supervisors. The records of three hundred twenty students were examined and the personal criticisms contained were classified under the topics of I, Preparation; II, Teaching Skill; III, Classroom Management, and IV, Personality. This classification was a rich source of suggestion for the sub-topics used in the finished score-card. It did not however strongly emphasize the use of certain topics, as, for instance, I, B; I, C; III, B; III, C. The distribution of these personal criticisms and their bearing upon the score-card is shown in Table I.

TABLE I

I. Preparation.	47
A. Lesson plans	33
B. Daily or weekly plans.	9
C. Use of course of study.	5
II. Teaching skill	277
A. Stimulation of interest.	81
B. Thought and response.	58
C. Drill.	42
D. Economical use of time.	51
E. Results.	45
III. Classroom management	101
A. Organization of class.	39
B. Care of room.	10
C. Discipline.	12
D. Clerical work	40
IV. Personal fitness	127
A. Physical.	43
B. Progressiveness.	13
C. Manners and morals.	19
D. Sociability.	52

⁶ Causes of Failures Among Teachers. *School Administration and Supervision*, September, 1915.

⁷ Same as 4.

The topics presented in Table I are resolved into questions (see score-card at end of the description), because questions may be more definite in their reference and also more stimulating to the critic teacher who may use this score-card.

After the score-card was prepared for the first time, it was often submitted for expert criticism and consequently, it was under continual revision for a course of several months. After a set form was decided upon, judgments were obtained as to the relative importance of the main topics and major sub-topics.

METHOD OF OBTAINING JUDGMENTS

One hundred eighty-three score-cards were distributed personally to as many different judges at different times and personal instructions were given as to the manner of distributing one thousand (1,000) points: first, among the Roman numeral topics, and then as to the manner of redistributing them among the respective sub-topics. The oral instructions were in substance the same as found in the following circular letter. One hundred seventy letters were afterwards distributed among as many other judges. Each letter contained a copy of the score-card and the letter of instructions detailing as to the method to be followed in scoring it. The contents of the circular letter reads as follows:

NEW JERSEY STATE NORMAL SCHOOL, NEWARK, N. J.

DEAR SIR:

Kindly find enclosed a list of questions organized under four topics which, though simplified in form, cover the qualities of a teacher with a fair degree of thoroughness. Educators have expressed and often express their individual judgments as to the importance of certain factors listed here in question form. In order to promote uniformity of judgment and the professional welfare of our students in practice I am asking you to co-operate by giving me your personal judgment as to the relative value of each of these qualities of merit. Through an organization of the judgments of a few hundred experts in education it may be possible to arrive at a more definite standard and perhaps to devise a practical score-card for use in judging normal school students in training and practice.

In making your judgment of the relative value of these qualities will you be good enough to use figures, that it may be possible for me to derive a scale of values. Working upon the basis of 1,000, first distribute 1,000 points among the four topics: I, Preparation; II, Teaching Skill; III, School Management; IV, General Personal Fitness. Secondly, take whatever value you have assigned to I (Preparation), and distribute it among the A, B, and C topics. Kindly use the same method in distributing the credits for the sub-topics under II, III, and IV.

For instance, in judging the qualities of a building to be used for school purposes one may make a practical distribution of 1,000 credits as follows:

I. Site.	(125)
A. Location.	(55)
1. Accessibility.	(25)
2. Environment.	(30)
B. Drainage.	(30)
1. Elevation.	(20)
2. Nature of soil.	(10)
C. Size and form.	(40)
II. Building.	(165)
III. Service systems	(280)
IV. Classrooms.	(290)
V. Special rooms	(140)

The importance of each of the topics suggested by the enclosed questions has been scored in from fifteen to thirty minutes. After giving your expert judgment, kindly return in the accompanying envelope with or without signature.

Thanking you very kindly for your co-operation, I remain

Very truly yours,

One hundred eighty-seven score-cards from the total of three hundred fifty-three were returned for examination. Only one hundred thirty of this total were used. Papers were rejected largely on the basis of faulty calculation in the distribution of scores or because of incompleteness. Among those who submitted their judgments on the relative value of the topics on the score-card were State, County, and City Superintendents, School Principals, and Critic, and Practice Teachers.

MEDIANS AND DEVIATIONS

Since the scores allotted to topics I, II, III, and IV were grouped about the points of 50, 100, 150, 200, 250, 300, 350, 400, 450, 500, etc., a step of fifty was decided upon, beginning with twenty-six and ending with seventy-five. The series of subsequent steps is found in Table II. The distribution of judgments, medians, and average deviations may be found in the same table. It will be noted, according to Table II, that Teaching Skill is ranked first; Classroom Management, second; Personality, third; and Preparation, fourth. In the case of experienced teachers who may not be required to make definite lesson plans for each lesson taught, the topic of Preparation is commonly included under Teaching Skill. It is not the custom of many of the judges to give such emphasis to Preparation as may seem necessary in preparing a score-card for rating student teachers in practice. It may therefore be surprising to note that the topic of Preparation received as high a median as 204.42 by a group of judges engaged in such varied educational activities.

The scores distributed to the sub-topics centered about 25, 50, 75, 100, 125, etc. The step of twenty-five was therefore adopted, the first one beginning with $13\frac{1}{2}$ and ending with $37\frac{1}{2}$. The distribution of scores to each of the topics, together with their medians, average deviations, and their rank, may be found in Table III.

TABLE II

26-75.....	2	..	2	2
76-125.....	21	..	9	10
126-175.....	27	..	19	25
176-225.....	33	7	39	48
226-275.....	26	16	31	19
276-325.....	15	31	21	14
326-375.....	3	26	3	3
376-425.....	2	32	5	7
426-475.....	1	6	1	..
476-525.....	..	10	..	1
526-575.....	..	1	..	..
576-625.....	..	1	..	..
626-675.....	..	..	..	..
676-725.....	..	..	..	1
Median.....	204.42	357.57	227.16	210.85
A. D.....	27.5	60.99	58.96	57.51
Rank.....	4	1	2	3

By using the steps of 50 and 25, I found it necessary to correct slightly the median values so as to make them total a thousand (1,000) points. Only the corrected medians are given in Tables II and III. These median values are given in such numbers as would be cumbersome to use; as, for instance, I, Preparation, median 204.42. For the sake of convenience, this number has been approximated by the use of 200. Each of the medians has been approximated in like manner and the scores thus derived are given on the first page of the completed three-page score-card.

TABLE III

	I-A	I-B	I-C	II-A	II-B	II-C	II-D	II-E	III-A	III-B	III-C	III-D	IV-A	IV-B	IV-C	IV-D
13½-37½.....	12	44	32	2	9	30	23	18	34	57	78	5	26	41	48	39
38½-62½.....	20	51	58	30	36	73	65	37	53	54	44	25	54	53	56	49
63½-82½.....	25	24	26	35	32	19	24	28	28	13	8	30	25	18	14	25
83½-112½.....	40	9	10	46	40	7	14	37	15	5	..	45	23	15	12	11
113½-137½.....	7	..	3	5	7	..	3	2	..	1	..	6	..	..	..	1
138½-162½.....	15	..	1	10	3	1	..	5	..	..	..	10	1	..	..	4
163½-187½.....	2	..	..	1	1	..	3	..	..	..	..	2	..	..	..	..
188½-212½.....	8	1	..	..	2	..	..	2	..	..	..	5	..	2	..	1
213½-237½.....	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..
238½-262½.....	..	1	..	..	..	..	..	1	..	..	..	1	..	..	..	..
263½-287½.....	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
288½-312½.....	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..
313½-337½.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
338½-362½.....	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
Median.....	95.64	52.24	56.54	90.37	82	53.5	56.25	75.45	55.92	44.1	35.63	91.51	58.28	51.15	48.16	53.26
A. D.	29.9	15.8	117.9	34.9	25.4	13.2	18.42	29.34	18.6	16.26	13.7	36.6	22.6	22.8	15.3	21.61
Rank.....	1	13	9	2	4	11	7	5	8	15	16	3	6	12	14	10

SCORE-CARD FOR RATING STUDENT-TEACHERS IN TRAINING
AND PRACTICE

	Total points	Poor	Fair	Good	Very good	Excellent
I. PREPARATION.....	200	below 140	140-154	154-168	168-182	182-200
A. Lesson plans.....	95	“ 66	66-73	73-80	80-87	87-95
B. Daily or weekly plans..	50	“ 35	35-39	39-43	43-47	47-50
C. Use of course of study..	55	“ 38	38-42	42-46	46-50	50-55
II. TEACHING SKILL.....	360	“ 252	252-279	279-306	306-333	333-360
A. Stimulation of interest..	90	“ 63	63-70	70-77	77-84	84-90
B. Thought and response..	85	“ 59	59-65	65-71	71-77	77-85
C. Drill.....	55	“ 38	38-42	42-46	46-50	50-55
D. Economy of time.....	55	“ 38	38-42	42-46	46-50	50-55
E. Results.....	75	“ 52	52-58	58-64	64-72	72-75
III. CLASSROOM MANAGEMENT..	230	“ 161	161-178	178-195	195-212	212-230
A. Organization of class..	60	“ 42	42-46	46-50	50-54	54-60
B. Care of room.....	45	“ 31	31-34	34-37	37-40	40-45
C. Discipline.....	90	“ 63	63-70	70-77	77-84	84-90
D. Clerical work.....	35	“ 24	24-27	27-30	30-33	33-35
IV. PERSONAL FITNESS.....	210	“ 147	147-163	163-179	179-195	195-210
A. Physical.....	60	“ 42	42-46	46-50	50-54	54-60
B. Progressive.....	50	“ 35	35-39	39-43	43-47	47-50
C. Manners and morals..	45	“ 31	31-34	34-37	37-40	40-45
D. Social fitness.....	55	“ 38	38-42	42-46	46-50	50-55
Totals.....						

I. Preparation.

- A. To what extent is the teacher efficient in planning individual lessons?
1. Is the aim of each lesson definite?
 2. Is suitable and adequate teaching material selected?
 3. Are the essential values emphasized?
 4. Does the teacher plan to present materials and facts in their natural sequence?
 5. Does the teacher plan suitable methods of presentation and drill?
 6. Does the teacher plan suitable class or individual assignments with periods and methods for studying same?
- B. To what extent does the teacher make satisfactory daily, weekly, or monthly plans?
- C. To what extent does the teacher show ability to make independent and intelligent use of prescribed course of study?

II. Teaching skill.

- A. To what extent does the teacher stimulate interest?
 - 1. Is the teacher active, forceful, and inspiring?
 - 2. Does the teacher illustrate the facts taught?
 - 3. Does the teacher use the pupil's responses?
 - 4. Does the teacher use worthy motives?
 - 5. Does the teacher vary her methods?
- B. To what extent does the teacher train the class to be thoughtful and responsive?
 - 1. Does the teacher promote earnest discussion, supplementing, verifying, and questioning, by individuals of the class?
 - 2. Are the questions asked, thought-provoking and thought-directing?
 - 3. Does the teacher require logical responses and from each individual of the class?
- C. To what extent does the teacher show skill in drilling facts and knowledge?
 - 1. Are the methods and devices varied?
 - 2. Are the facts drilled by relating them to other thoughts or life situations?
- D. To what extent does the teacher economize time and energy?
 - 1. Is the aim of each activity clear in the minds of the pupils?
 - 2. Is the whole class kept at work throughout work periods?
 - 3. Are students taught to use books and how to study?
 - 4. Is the work carried on with reasonable rapidity and absolute accuracy?
- E. To what extent does the teacher get results?
 - 1. Have the pupils learned the facts which the teacher intended to convey?
 - 2. Do the pupils know how to use information which they have gained?

III. School management.

- A. To what extent has the teacher shown ability to organize a class?
 - 1. Has the teacher shown ability to classify the students?
 - 2. Has the teacher shown ability to prepare a class program?
 - 3. Has the teacher shown ability to reduce routine to an automatic basis?
- B. To what extent has the teacher proven to be a good "caretaker" of the classroom?
 - 1. Are the best possible conditions as to heat, light, and ventilation maintained?
 - 2. Is the classroom neat, orderly, and suitably decorated?
- C. To what extent is the teacher prompt, accurate, and neat in clerical work?
- D. To what extent does the teacher show ability to govern the class?
 - 1. Is the teacher sympathetic and appreciative in working with students?

2. Is the teacher sincere and just in dealing with students?
 3. Does the teacher show authority with self-control, self-reliance, firmness?
 4. Does the teacher respond to a condition of disorder quickly and tactfully?
- IV. General personal fitness.
- A. To what extent is the teacher physically adapted to teach?
 1. Is the teacher physically strong and energetic?
 2. Has the teacher good physical poise?
 3. Has the teacher a good speaking voice?
 4. Is the teacher personally neat?
 - B. To what extent does the teacher show native mental capacity and a disposition to progress?
 - C. To what extent does the teacher exemplify good manners and good morals?
 - D. To what extent is the teacher well fitted socially for her profession?
 1. Is the teacher fundamentally interested in child-nature?
 2. Does the teacher co-operate with pupils in their out-of-school interests and activities?
 3. Does the teacher co-operate easily with co-workers?
 4. Is the teacher inclined to be a leader in social and educational movements for the benefit of the community?

THE GROWTH OF A CHILD'S CONCEPTS

BY CEPHAS GUILLET

Seven years ago Professor and Mrs. Chamberlain published in the PEDAGOGICAL SEMINARY* a list of nearly 1,200 words with the meanings given to them by their little daughter when nearly four years old. The same year that it appeared, I asked my own little boy, then not quite four years and two months old, the meanings of some 400 of the words. Three years later I asked him more than 200 of the same words again: and, after three more years, I questioned him regarding the first ninety of the same words. Thus his age for the three experiments was four, seven and ten. The question was always put in the form: "What does *acorn* mean?" or "What is *acorn*?" At four the child had had no kindergarten or Sunday School instruction; at seven he had had kindergarten and had just entered the second grade; at ten he had just entered the fifth grade.

Of the ninety words the four-year-old child proved to have some conception for all but three. For nine of the words he had only a glimmer of meaning. Let us take one of these words and follow the growth of its meaning as indicated by our three cross-sections of the child's mind. As I have studied these naïve meanings, I have felt as though I were looking right into the mind of the child.

For *ankle* he said at four: "it's a head." I interpret this response as showing that the child had a dim idea that the ankle is a part of the body. He has not yet consciously conceived the ankle or any other of his bodily organs (as shown by other answers) as parts of the body, but they are in fact identified with the body in a vague subconscious way and hence have this in common. Such a class-idea or concept I call a *generic* idea to distinguish it from the clear consciousness of class or general meaning, which is expressed by the actual mention of some common element, and which I therefore call a *general* idea.

At seven the child's notion of ankle was still vague; for, on hearing the word, he at once looked down at his foot, then at his hand, and pointing to the knuckles said: "Why! that—that's an ankle." I said no. Then he pointed to his

* Vol. 16 (1909) p. 64: "Studies of a Child. IV. 'Meanings' and 'Definitions' in the 47th and 48th months."

elbow. Again I said no. Then he pointed to his knee, but said: "That's a knee." Finally he pointed to his thigh. Is it not evident, from his pointing to these prominent bones, that he had a vague generic idea that the ankle was some prominent bone or even joint of his body? But the idea is not so vague as it was three years before. It is a more complete idea,—not clear and yet less dim. And is it not interesting that the first movement of his mind was more correct than his later and more consciously attentive efforts? For, when I put the word to him, he at once glanced down at his foot! And is it not apparent that, if asked this question again when a little older, he would clearly indicate the ankle by pointing to it or feeling it, thus expressing a generic idea of the word no longer vague but perfectly clear?

As, however, I did not ask him again for three years, there was time for the growth of a much clearer as well as richer concept than that. He said, in fact: "Well, it's right near your foot: it's right touching, you could say, your foot." Then, feeling his ankle, he continued: "A big hump like a bruise, only it's a bone and hard." Here we have a clearly-defined concept, containing the position, size, shape, hardness and class. Indeed, he puts it into two classes, not only calling it a bone, but using a simile and putting it with bruises into the class "humps." Note also that, in contrast to his state of mind at seven, the more he thinks about ankle now, the clearer the concept becomes. He thus gives evidence of a much greater power of thought than he possessed at seven. His powers of expression have also greatly increased, and here, as in all his other definitions, prove the close and necessary alliance between clear thinking and clear expression.

I may add that I have found several quite normal boys of ten in the fifth grade who still have a very ill-defined notion of the ankle; for they have only a vague idea that it is part of their leg, and some say it is their knee or a part of their knee. And, if an examination were made, children would be found in this vague condition of ideation in regard to a great many things. Let any teacher towards the close of a lesson question his class upon the matters presented, and he will find that many of his pupils are in the stage of generic ideation regarding them. It is probable that about some things we are all in the vague state of mind this four-year-old was in when he said for *ankle* "It's a head," for *bag* "A towel" and for *afternoon* "It means to-morrow, does it?"

The stage of clear generic ideation, which evidently occurred between the ages of seven and ten in the case of the difficult word ankle, I caught the child at in the case of the words

bit, animal, apple, ant, beautiful and beauty, at the age of four. For animal he said: "It means a elephant and a lion and a pig and a Teddy Bear,—a bear, a awful bear!" The various animals mentioned were evidently conceived as belonging to the class animals without the attention being focused upon any common element of the class—meaning, but only upon individual members of the class. The generic idea is evidently a transition stage between the percept and the general idea. The percept is conceived as a particular instance of a class in a concrete, intuitive, subconscious way, before conscious attention is given to the common elements or abstract relations that characterize the perceptual members of the class and are its essential meaning.

When asked the word animal again at seven, the little fellow said: "You mean bird? Any old thing, eh? Well, I think that it's a thing that grows and lives a life." Here we have not merely a general idea but a very well-defined one. It is indeed a classifying idea that he expresses, for he puts the animal into the class of living things. The only fault we could find with it is that it is too broad, including both plants and animals. But it will probably be a long time before the boy's concept becomes so complete as to distinguish these two forms of life. He does not yet do so at ten, for he now says: "It's a thing that God made to help man so he could live and have food and clothing. Isn't that right? That's one reason anyway." Though the concept is no better defined, it has certainly become greatly enriched.

At four, other instances of clear generic conception are

Apple—"I saw a apple as red as an old barn."

Ant—"Means a great big ant, a mother ant."

Beautiful—"Flowers, pink flowers and ice-cream, and, you know, little lanterns (he meant candles), little tiny bits of ones for babies."

Beauty—"Pink flowers and pink ice-cream."

Bit—"O a little bit at a time." (Said after some hesitation and "I don't know what it means.")

The simplest general ideas expressed by the child would seem to be those where the general idea is involved in the association of some common element, namely some quality, object, action or state. Such simple general ideas we shall call elementary general ideas. Two-thirds of the four-year-old's responses were of this nature. For example, in his definition for cane, "A cane is long," a quality is formally associated with the thing denoted by the word. In his definition for bee, "A sting—honey," two objects are associated with the thing. In thirteen cases the child defines what the object does, as

Baby—"Wettin;" *calf*—"To eat—to have cream;" *bear*—"To eat you;" *blackbird*—"To fly: and air means to have the bird's wings fly—swiftly through the air;" *bud*—"To grow;" *beef*—"To cook;" *acorn*—"To pick up in the ground."

On account of the absence of any subject to the verb, one cannot always tell whether the child had in mind action by or with the object, but forty-six of his definitions seem to come under the category of what is done to or with the object. The following are examples:

- Bureau*—Looking in the glass.
Bone—Bone's for dog. We have a dog we give some bones and gravy and meat. Got that right?
Cage—For lions to get in—growl.
Barrel—To put in clothes and things and apples. Means to put in a barrel.
Bouquet—To put in water; and water means for fishes to put in, and water means to swim in out in Stony Lake.
Boardinghouse—To cook in.
Bowl—To put in cookies to eat, and candies means to suck and chocolates means to eat.
Bead—To put on and wear; you know, those red beads and black beads and yellow beads, pink beads and blue beads and white beads.
Bonnet—To put on for babies.
Bow—To put on under your neck.
Cap—to cover hair.
Camel—To eat—to ride on.
Board—To teeter-tawter.
Brush—I don't know. O, a brush means to eat. I don't know. Means to—What does it mean? Brush means to brush, to brush,—what to brush your boots.
Broom—To sweep dirt. Dirt's not good to eat.
Bible—To read when you have the blessing. I own the schools and churches both.
Birthday—To have toys.
Beans—To eat, and your mouth is to put food in, to put beans and things in.
Bitter—Not eat; means I don't like bitter.
 A very neat definition was that for camp: "To go in tents."

We have seen that a very large proportion of this child's definitions at four years are couched in terms of action, a verb in the infinitive being nearly always used, but occasionally a present participle. At this age children's attention is attracted to what things *do*, or what we do to them or in connection with them, rather than to what they *are*. We are not surprised to learn that the child possesses this trait in common with primitive man, many of whose nouns are exactly similar expressions of action to or relating to the things they denote. How long does this disposition continue in the child? At seven I found that, instead of fifty-nine words standing simply for general ideas of action, there are now thirty-seven. The number is still great and it would be interesting to know the further history of the tendency. My present data give no

further light except the fact that at ten this tendency to focus the attention primarily and chiefly upon action has disappeared.

Of the thirty-seven definitions at seven denoting action, twenty-eight tell again what people do to or with the object denoted by the word. For example:

Box—To put things in; something like that box (pointing to one). (Note that he does not merely say "that box," as a much younger child would.)

Bow—Is to put on your hair, especially for little girls, if you're talking about 'em.

Ball—A bill is to throw, to bounce.

Beans—Are to eat, sometimes to boil, if you mean brown beans or whatever you call those.

Candy—To eat—sweet.

There were three definitions telling what is done by the object, as: Arm—"That's what you feel with: that's what to hold the hand." Then there were five telling what is done both to and by the object, as: Bear—"Well, that's just to grow: or sometimes we eat it—red bear—sometimes hunters go out and get some. I haven't, but I know they do that." Finally there is one definition purporting to tell the origin of the object: Beef—"Comes out of a pig. You eat it. It's good, beef is."

The child at seven sometimes, though not often, added to his description interesting details which gave evidence of a widening experience through observation, action or books.

Board—Sometimes to make bread on, and sometimes to walk on, and sometimes make fences with boards, and sometimes make houses with boards, and all kinds of things with boards.

Boat—To sail in and to row in and to paddle in.

Camp—To live when you go out camping; pitch your tent up, that's camping.

Camel—To ride on—to live—drinks lots of water; keeps in his brains or something. Now, don't ask me too hard questions.

At four the child is already sometimes interested not merely in the action but in the purpose of or reason for the action. There are now eight instances of this intelligent interest. The purpose is generally very simply interpreted in accordance with the child's narrow range of experience.

Call—To come here and look at this thing.

Bell—To ring for people to get in and start.

Box—To put in things; cause, if the Indians would get them, then the people wouldn't find them.

Book—To read in; cause, if you didn't read, I wouldn't have any stories.

Black—Not to eat; cause black isn't good to eat. No sir, black isn't good to eat; cause, if you eat black, you don't like it and you throw it away. If you eat ink, you don't like it, do you?

Boy—Has to eat; cause, if the boy didn't eat, he would be hungry all day.

As we should expect, this explanatory tendency is more strongly developed at seven and is liable to be expressed in more general terms. And the purpose may be applied directly to the thing or to the name itself. There are now nineteen cases of this interpretation of the meaning of words of which the following are examples:

Call—Why, when anybody wants you for something, they call you.

Bell—That's to ring,—dinner bell or whatever you mean.

Boardinghouse—To board in; to live in while you have no house.

Clothes—If you didn't have clothes, everybody would see your body.

Cage—To put an animal what's kind of greedy in or he might eat you.

Bib—Is to put around your neck, so no spots or anything'll get on you.

Birth-day—Is just to know when you were born.

Buttercup—Some part of the butter. They call that name from the butter cause it looks so much like a butter, shines so much, and is so juicy.

Bit—A little bit. O Gee! O Golly! Don't ask me; I don't know. When you want to eat a *little* bit, I think it isn't good for your stomach!

As the child is naturally so much interested in action in his early years, it is evident that his environment should afford much opportunity not only for varied action on his part but for the observation of other objects in action. Pictures of animals for children should always show the animals doing things and not in the common position of stuffed museum specimens. Gradually also the child should be led to describe and interpret what he sees—both qualities and actions—in clear, simple and correct language. We should strive to keep the child upon the plane of accurate expression of his ideas *all the way up*. The child accustomed to a slovenly expression of his simple ideas will, when grown up, inevitably express his maturer ideas in a similarly illiterate manner; while the child in whom the habit of accurate and elegant expression is early formed, will retain it throughout his life.

To the unthinking, to say "animal," when asked what *bear* is, amounts to the same thing as to say "bear," when asked the meaning of *animal*. Such a person will be surprised that a child does not usually say "Buttercup is a flower" and be done with it, instead of indulging in so much talk about its appearance and its name as did this little boy. But the two reactions really involve very different processes: in the one an image of an example is called up by the mention of the class; in the other the concrete image must call up a general idea. To the child the latter process is much more difficult, because his experience has been very largely concrete, and the habit of generalization is not yet formed. How slow such

a habit is in ripening is evidenced by the fact that at four this little boy generalized in this way by putting the object denoted by the word into some class by the use of a class-name only three times, and in two of these he simply used the word *thing*, as:

Ball—A yellow ball; a old round thing.

Banana—Is a long thing.

Bank—A long grass, a hill with grass, with flowers all along it.

At seven the boy was never satisfied merely to mention concrete individuals when asked to define some class-name; and, on the other hand, he defined an individual by using a class-name far oftener than at four, indeed eighteen times; and at ten nearly everything was put into a class.

At seven the effort was still often crude; witness the following:

Banana—A thing you ought to eat and it grows on a tree; it has a lot of yellow skin.

Apple—Part of a tree, part of an apple-tree.

Bushel—A lot of things.

Bush—A brambly thing. You can't get out of it hardly. Prickly, if you mean rosebush.

Bug—Is a little thing. Bug crawls around, does some little damage, especially a bee stings.

Afternoon—(After much hesitation) Why, that's noon,—noontime.

Black—Is black. I don't know. Is just the same as white, only it's darker.

Bureau—To put your brushes and combs and things on. It's a glass.

The following words were better defined:

Bone—Well, part of an animal, the hardest part it's got.

Bread—Is to eat. Is about the best kind of food you can get in the world,—one of the best.

Applesauce—Is an apple,—tiny bits of apple cut up.

Broth—Soup.

Bud—A young flower.

Calf—A young cow.

Block—You mean a toy? To play with, to build with.

Bouquet—To smell and look pretty. That's a bunch of flowers.

Beautiful—O beautiful; what do you mean? If anything's pretty, that makes it beautiful,—beautiful flowers or beautiful something, flowers especially.

In the definition of beautiful, instead of a class-name a synonym is used.

In these definitions by class-name and synonym we have at last reached a form of definition that is used by the much more mature ten-year-old. Some of his definitions are crude, but they are on a level with the best of the same child at four and seven, while far the greater number are better, and often very much better, witness the following:

Bug—A beetle or some insect.

Brother—A second boy that is born in the same family.

Acorn—Why, it's a nut of an oak-tree.

Clothes—Garments.

Beef—It's the meat of a cow.

Black—The darkest color in the world.

Breakfast—The first meal of the day.

Afternoon—The latter part of the time when it's light. Or about after dinner, you could say.

Book—A book is a lot of pieces of paper sewed together and an outer covering and a name on it; and it tells you something; and on each one of the pages has some writing on it, unless it is a picture. Ha ha!

The little laugh with which this last definition closes sounds like a triumphant exclamation; and, indeed, not only that definition, but most of those I have cited from the ten-year-old could hardly be better either in idea or in form. Is it not evident, then, that at ten this child was quite capable of classifying objects accurately, and that for him the time has arrived for the serious scientific classification of natural objects, and not merely the "nature study" observations, too often very meager and superficial, which alone engage the attention of pupils at this age in our schools, and fail to rouse the active interest of an eager child? Is it not evident also that at this age a teacher may fairly expect from such a child, and encourage in him, clear definitions of the things that come within the range of his interest and experience?

The classifying definitions containing additional details of an interesting descriptive or explanatory nature are only ten at seven years, but very numerous at ten, seventy per cent of the words being thus fully defined at this age. Some of the explanations at seven are very crude; but others, particularly those regarding acorn, ant, baby and bible, show considerable power of analysis and reflection. That for animal has already been given. The other nine are as follows:

Bee—Well, that's a thing that makes honey, that lives and makes its honey out of clover and some other kinds of flowers; I don't know,—lilacs sometimes.

Boy—He's God's young sheep, one of God's sheep, God's young sheep, a lamb.

Bank—You mean a little hill or a bank to keep money in? (I said the hill.) How could you live? How could you walk? There'd be a great big hole if there wasn't a bank there.

Apron—What a woman puts on around her waist to protect her from any old spots and things to get on her dress.

Ant—It's a little thing that crawls all over the ground to find its way.

Bible—That's only a thing to read out of, to know what God is and know about God.

Back—Is a thing that you want to lie on. If you didn't have a back, you couldn't live. Everyone would look at you and see inside you. Back helps you to grow. Whole thing gets bigger when the back gets bigger.

Acorn—The life of a tree. You can plant a acorn.

Baby—A baby is just a thing that's starting to grow. It's a little seed at first, and then it comes up and sprouts and sprouts to big.

At ten years thirteen of the meanings contain rich descriptive content only, while fifty-three of the ninety words are defined with explanatory comment added to the descriptive. I shall quote a few of these which fairly illustrate their character:

His definition for *bread* is almost Rabelaisian in its flow of language and free use of synonyms: "Is made of flour. The first process is wheat. You thresh her up and clean her out and get the chaff out, that is the hull sort of. And then they splash, bang and grind her up, make white stuff called flour. And they take the flour and put water with it and make something that is called bread. Guess they have to bake it, only I thought you'd know that."

His interest in Indians is betrayed when he comes to define *blanket*.—"Is something made of wool or cotton woven, very thickly woven with machinery. It is to put around you when you go to sleep or when you're cold. Some Indian squaws wear the blanket all the day round. Usually modern people use it only in the nighttime to wrap themselves in and keep warm."

In defining *boy* he indulges in a curious bit of sly criticism:—"A boy is a human being and can walk around, and he is the young of a man, and when he grows up he is a man—usually."

His neat definition of *camp* now indicates a rich vacation experience:—"Is a place where only tents are used. It is a place where you stay for a day or a week. People do not stay long in camps. A camp is one or more tents put in one group. It is on the bank of a river or woods. They do not usually have camps in cities but just in the wilds. Sometimes it is not a tent but just a few branches over a limb to keep from the rain. You might say a camp is a shelter."

His fondness for boating and for boats, which he likes to draw, is quite apparent in his loquacious definition of the word *boat*, as well as his keen interest in the war.—"Is a lot of boards nailed closely together so the water can't get at them; and it is shaped like it is round at each end and comes up to a point at the top. And some boats have keels and some haven't. And there are all sizes of boats. And they are made of wood or steel or maybe iron. And there's a lot of different kinds of boats. Canoe goes by man's hand,—paddle. Steamboats go by steam. The motor-boats go by gasoline-engine. Row-boats, they go by the oars that you pull,—man's hand. And there are flip-flops that are used in swimming. There's the submarine that goes under water; there's the warship that goes on top of the water; and there's the little torpedo-boats. There are sail-boats of all descriptions; and there is one big boat that is called a torpedo-(*destroyer* was the word he was trying to recall). They all go in some part of the water."

His full descriptions of animals show his interest in observing and reading about them. I shall quote two of these. "A *bear* is an animal something like a dog only it is larger and has thick fur and short claws and is a great fighter. I think it is one of the hardest fighting animals in the world." "A *camel* is an animal of the desert and it has one or two humps on the back. The hump looks like a little tiny mountain. The humps are from two to three feet high. The camel's eyes are very strong so that he can stand the sands of the desert. He has a very long neck and legs, but not so long as the giraffe. It is colored brown. The eyes are so strong that it can see a long ways; and, if it sees a storm of sand coming, it always

crouches down so its master can get off and get behind it. Its eyelids are so thick that the sand can't penetrate through them, no matter how hard the sand beats upon them. It is a great protection to the Arab, for the Arab gets behind it always in the storm."

He several times tried to be mathematically accurate, as in his definition of buttercup.—"O, flower the color of butter and shaped like a cup, and about a tenth as big, if the bowl is five inches across at the top." Other instances are his description of a barrel as being "three feet high," of a baby as "just like a man, only about one quarter as big," and of a ball as being "as round as anything can be; every edge is as far from the center as any other edge."

His use of simile is interesting; it occurs some twenty-five times now. There were but two or three instances at four and at seven. A notable instance at ten was his likening the backbone to a tree "cause it's got a whole lot of branches."

GROWTH IN THE CONCEPTION OF NINETY WORDS

Age	4	7	10
No content expressed	3	0	0
A vague generic idea (value one mark).....	9	2	0
A clear generic idea (one mark).....	6	0	0
An elementary general idea (two marks).....	61	37	0
An elementary general idea with rich descriptive content (three marks).....	0	4	0
An elementary general idea with explanatory content (three marks).....	8	19	0
An ill-defined classifying idea (value four marks).....	2	8	0
A well-defined classifying idea (five marks).....	1	10	24
A classifying idea with rich descriptive content (six marks)	0	3	13
A classifying idea with explanatory content (seven marks)	0	7	53
Relative score in percentage of age ten.....	30	52	100
Relative number of words used in percentage of age ten	25	38	100
Relative number of <i>different</i> words used in percentage of age ten	29	37	100
Average number of words for each definition.....	7	12	32
Average number of different words for each definition	2.6	3.3	8.9

In defining the ninety words the boy at four used 734 words, at seven 1,105 words and at ten 2,904, so that his definitions contained at four on an average seven words, at seven twelve words and at ten about thirty-two. The number of *different* words used at each age was respectively 230, 298 and 796. During the whole investigation the boy used 944 different words. At four he used 85 and at seven 81 words that he did not use at ten. Only 15 of these were the same in both cases. At four he used 113 words not used at seven and at seven 178 words not used at four. At ten he used 651 words not used at four and 579 not used at seven. Words

beginning with the letters *b* and *s* were much the most numerous. Assigning marks to the different degrees of conception, as shown in the table, I reckoned that at four the child gained 173 marks, at seven 294, and at ten 569 out of a possible 630, if all the words had been very clearly and fully defined, that is, if the concepts had been expressed correctly and with a rich descriptive and explanatory content. Expressed in percentage of his ten-year-old achievement, the boy at four made a score of 30 in value and at seven of 52; in number of words at four 20 and at seven 37; and in number of *different* words 29 at four and 37 at seven. To express his rich content of experience the ten-year-old naturally needed a rich vocabulary. Larger experience is accompanied by fuller vocabulary and greater powers of expression.

In a few cases at four years, notably *bear*, *beef* and *bread*, after defining the word as best he could, the little fellow wandered on rather excitedly and, particularly in one case (*beef*), irrelevantly. The following instance was due chiefly to fatigue, which acted as an irritant:

Bread—"To eat. Everything means to eat except blocks and except cuffs and or inks and cept papers and cept writings and cept street-cars and cept butterflies. Not pens are to eat or trees are not to eat. I'm kind of weeping now, but I'm not tired. No, I'm not tired a bit, but I'm just kind of weeping my eyes."

That evening he gave thirty-seven meanings in fifteen minutes (from 6.53 to 7.08 p. m.) and *bread* was the thirty-fifth. Even after the thirty-seventh he insisted that he was not tired and was anxious for me to proceed. In defining the interesting word *bear*, an aroused imagination partly accounts for his uncontrolled impulse to talk, but fatigue contributed here also, as it was the twelfth word asked him after supper one evening and he gave other signs of being tired.

Bear—"Means to eat you, and lions will eat you. If you get by horses, they'll eat you and kick you and everything. If you get by tigers and lions and elephants and bears. You know those Indians used to be wild, but they don't now."

But to return to our statistics, in whatever way we regard the matter, it is quite apparent that this boy was at seven much nearer his four-year-old mentality than his ten-year-old. That is, there was a much greater growth of conception and power of expression between seven and ten than between four and seven. Indeed the four-year-old definitions have only in three cases a resemblance to those at ten, while the four and seven year old definitions come under the same categories in all but a few cases. Comparing seven with ten also, we find only twenty words defined at seven according to ten-year-old

standards. At ten the child defines his words clearly and in general terms, beginning by putting the object of thought in its proper class, and then entering upon a fairly orderly description with explanatory comment. He mentioned the materials of which the object is composed in 28 cases, the structure or process of making in 14, the parts in 14, the shape in 14, the size in eight, the color in eight, and the flavor in six cases.

In view of this wealth both of descriptive and of explanatory content at ten in the concepts of this boy, he has evidently made great progress in the interpretation of experience. For explanation involves higher mental processes than description: the one involves the understanding, the other the reason. Training in wide and accurate observation and in well-reasoned explanation, therefore, should now proceed hand in hand, the latter based squarely upon the former. I have no doubt that this very investigation acted as a spur to the powers of accurate observation and expression of this little boy, although he was not once corrected or taught anything or even encouraged to go on talking. That the work was oral was an advantage: for oral expression is more free and natural than written, especially to the child, for whom writing is so slow a process. And surely for a child to tell the meaning of words in his own words, or even to use them in their proper setting, is a better exercise than hunting up words in a dictionary. This child's answers were given with a promptness and a zest and an originality that could not have been present to the same extent had he been made to write them.

It may be objected that this is a one-child psychology. But one need not be too much disconcerted by such a remark. Children are, each and every one of them, children, both physically and mentally, and, though they differ in precocity and rapidity of growth, it is not probable that the facts concerning the order of growth, whether physical or mental, discovered in one child, will be materially contradicted by those found in another. And I have good reason to believe that the study of a single child is the best kind of preparation—I had almost said essential as a preparation—for the mass studies that have been but too lightly entered upon in the past. Let me illustrate the point by referring to a mass-investigation on this very subject,—one conducted not by a tyro but by one of our leading investigators of childhood, one to whom, indeed, we all owe much inspiration.

Some years ago this gentleman¹ issued a questionnaire addressed to teachers in London, England, and in Boston, Mass.,

¹ Earl Barnes: "How Words Get Content," in *California Studies in Education*, vol. 2 (1902), p. 43.

requesting them to have their children write out meanings for the six words *monk*, *peasant*, *emperor*, *armor*, *nation* and *school*. Studying the 2,700 returns, the investigator discovered what he called "a general law of development," namely, that, in their growth towards complete conception in the child's mind, words pass through the three successive stages of *no content*, *wrong content*, and *partial content*, and we are shown tables and shaded charts which are supposed to demonstrate this law.

Not long after this law was thus announced, another man undertook to investigate the same subject in the same way and with the same words. With the coöperation of teachers he secured the same number of returns from the schools of the Middle West. And this investigator rediscovered the very identical law of development that his predecessor in this field had hit upon. And he constructed from his tables even more beautiful charts to picture what he called "the sweep of the crest of the wave of development." "The curve of *wrong answer* for *monk*," says this investigator,² "represents the number of children of each age who have seen or heard the symbol but have associated with it wrong ideas. It is significant that this curve rises almost as rapidly from six to ten as the curve for *no answer* falls. This *wrong answer* tendency is intermediate in the evolution of the concept between *no content* and a *correct content*. Many children, who, at six or seven, have not heard the word *monk* used, at eight or nine recognize the symbol but associate wrong images with it, or confuse it with other words that have a similar sound. Thus 'Monk is a monkey' or 'Monk is a chipmunk' show such confusion through euphonious analogy. The ages eight to eleven are especially characterized by this sort of answer. This seems to be a 'hit or miss' period, a time when the child would rather guess than confess ignorance." Note this naïve remark. The investigator builds a general law of development out of the wild guesses of children desperately anxious to answer his questions!

Now, I have to confess that I have found no evidence whatever of this "general law of development." In giving the meaning of one of the words, my little subject said *bushel* meant "to grow." The word that preceded *bushel* was *bush*, and to that he had responded "to grow," so that his answer showed, not that he really had any wrong association with the word *bushel* but that he never had had any content whatever regarding it, and did not then have any except the purely mechanical sound-association. How absurd it would be to say

² W. G. Chambers: "How Words Get Meaning," in *Pedagogical Seminary*, vol. 11 (1904), p. 39.

that this meaningless guess was "a stage" on the way from *no content* to the true though partial content that he had when next he was asked this word and said for *bushel* "Lots of things"! Moreover, for all the nearly 1,200 words put to the little Chamberlain girl, I have been able to find but one totally wrong definition.

All these gentlemen's tables prove is that there is an age when children, asked the meaning of a word which they do not know, are liable to make a guess at it. It is possible also that this is the age when children are most prone to use words wrongly, being naturally fond of using new words. But during my whole investigation the little subject used only two words wrongly. This was at ten, when he said "obstacle" for *object* and "electric" for *etc.* The word *electric* was well-known to him as he had often used it in such expressions as "electric cars" and "electric light," but he had never seen *etc.* written out and thought it an abbreviation for electric, and so had come to use electric in this sense too. This leaves, out of all the many hundreds of words he used during the course of the experiment, but one word for which he had a totally wrong content. So that this phenomenon is really very exceptional.

The point I am making is simply this: that no one who had carefully studied the growth of conception in a single child could ever have made so gross a blunder in the interpretation of statistical tables as did these two investigators. And does not this show the need of better observation, of more patient and careful observation, and of more training both in observation and in interpretation in our schools both high and low?

At the time of my first experiment with the little boy, namely at four years, I asked his little cousin, then five and a half years old, to tell me some of the meanings. He proved unable to tell what *brush* meant; but, after trying to think and giving it up, saying, "I don't know," he added reflectively: "When you don't know what it is, why you want to tell what to do with it." Is that not an interesting bit of psychological introspection? When a child cannot define a word accurately by putting it into its proper genus and species, then he tells about the action performed by or with the object. That is just what we found. And does it not follow that, if a child *can* give the word a more accurate definition by using a synonym or class-name, he does it? That too we found by examining the replies of the boy at ten. Therefore we are justified in judging of the degree of development by the expression the child gives to his ideas.

Putting it more generally, the little philosopher really meant: "When you can't do something better, you do the best you

can." And the inference is that, when you can do something better, you do it. I like that little boy's philosophy. The person, whether child or adult, who does not do the best he can, all the time, is not normal, is, in fact, a weakling, or on the sure road to becoming a weakling and a parasite. We have here really a statement of the great principle of mental and moral growth. If it were not a true statement, we should not be living in a lawful world; we could not bank on anything; we could form no expectations; and it would not be worth while studying phenomena. But the statement is true; and so we can go ahead with our study, assured that we may arrive at truths and principles universally applicable.

And if this is granted, does it not follow that the only sound basis for efficient action is serious study; and in particular that the only sound preparation for the training of minds is the study of mind; that the only sound preparation for the work of assisting mental growth is to study the facts and laws of mental growth?

What, then, I may be asked, have we for pedagogy here in this psychological analysis? We have first of all the suggestion that, just as in our sleep we are on various levels of consciousness from the deepest dreamless slumber to our waking, so in life we grow from the dim consciousness of infancy to the full, clear consciousness of maturity. Hence education should be a process of *waking up*, of waking the mind up, of bringing it to ever clearer, deeper, fuller consciousness. By judicious observation and interpretation of objects and facts, alternated with reading and conversing about the observation and interpretation of others, the mind is made more suggestible to truth. More and more brain-cells come into functional activity, more and more dispositions and associations are implanted, ready to spring up, at the bidding of slight but appropriate stimuli, and bring with them the new things that lie more or less richly in the depths of every child's consciousness.

In the second place, we have here the beginnings of a new scale for measuring the mental maturity and growth of the child. But such a scale, whatever its value when perfected, would really be of value to any teacher only in proportion as it was used intelligently, only in proportion as the experience gained by those who have devised the scale had become the experience of the users of the scale. The best that psychology can do for the teacher-in-training is not, on the one hand, to provide him with the tests and scales which psychologists are now so busily devising, nor, on the other hand, with rule of thumb methods of handling this or that subject in the curriculum; but it is to give him a state of mind, an attitude,—the

attitude of the intelligent, suggestible learner. No method should be elicited from or imparted to or practised by the teacher-in-training without reflection upon its purpose in the development of the child's mind and its fitness to further that purpose. To ensure this being done there should be the strongest possible correlation between psychology and methods in our normal schools and colleges. The work in methods, including the oversight of the teachers-in-training, should be in the hands either of the teacher of psychology or of one who is also a thoroughly trained psychologist convinced of the importance of psychology to pedagogy.

I have endeavored to suggest how close is the relation of psychology to pedagogy, how essential is the science of the mind as a basis for the art of the teacher. A word should be said about that branch of mental science which deals in a very specific way with the schoolroom problems of the teacher. Experimental pedagogy is a very recent graft upon the old psychological tree. I think one could give in an hour the facts already ascertained by its aid. But its significance, as well as that of child study, lies not in these facts, but in the method by which they have been ascertained. And the teacher who imbibed the facts without understanding the method of investigation would be little better off. I have discovered, by handing my data to untrained normal students and asking them to study the data and write their conclusions out for me, that it all means very little to their untrained and unsuggestible minds. The longest way round is sometimes the shortest way home. The indirect method of approach is often the most effective. If we, in our normal schools and colleges, sought to turn out investigators, we should succeed better in turning out teachers. I look forward confidently to the time when, our teachers having attained the stimulating and vitalizing point of view of the trained investigator, it will be possible to realize what I have formulated as the educational ideal: *Every child its own curriculum; every teacher his own method.*

Shall it be said of the profession of teaching (to adapt a clever reply of Bernard Shaw to his critics): Those who can, learn; those who can't—teach? All the great teachers of men have been also earnest students of man. We all have read how Socrates haunted the market-place to ply his questions. And the discourses of Jesus show how keen and sympathetic a student he was of human nature and especially of the child. So that the ideal teacher was well described long ago by Chaucer, when, depicting the clerk at Oxenford, he said:

“Sownynge in moral vertu was his speche,
And gladly wolde he lerne, and gladly teche.”

UNIVERSITY RESEARCH¹

By G. STANLEY HALL

A year ago last June our American Universities conferred 556 Doctorates, ten per cent more than the year before. The number has rather steadily increased since 1898, when records began. Since that date, we have created 6,320 men and women Doctors of Philosophy, and have about doubled the average annual output of a decade ago.² Each of these 6,320 Doctors, as an important part of his preparation, has produced a thesis which is generally thought by him, and often by the professor under whom it was prepared, to be a new contribution, however, small, to the sum of human knowledge. Some universities require this thesis to be printed, in full or in abstract, in order that the competent may judge somewhat concerning the basis of the degree, and also to give the young Doctor his first inspiring experience of publicity, and make him feel that he belongs to the body of investigators. One bookseller in Germany, where our stress on the thesis came from, sometime ago offered some thirty thousand dissertations for sale, of which I once bought about a hundred and found them helpful in my line, although since in Germany the preparer of a dissertation is in a sense an apprentice to the professor, his work is usually embodied later in the latter's production. Several lawsuits there have, however, given the student proprietary right to own and if he desires to print his own work, although the master under whom it was done has the second claim to it.

Since Mommsen's attack on the Doctor's dissertation, there has been much discussion as to its value, but I can find no sign of its relinquishment by professors in that country. Here the data you have all kindly furnished show the utmost diversity of opinion.

I. Opinions on this subject in the institutions here represented are hard to reconcile. One president of a large state university says fifty per cent of the so-called research in our universities represents an absurdly mechanical process for the grinding out of theses. The president of a large eastern university says nine-tenths of what is called original research in

¹ Address delivered at the 18th conference of the Association of American Universities, Worcester, Mass., November 10, 1916.

² *Science*, Oct. 22, 1915; p. 555 *et seq.*

America to-day as represented in theses is not worth doing. Another says that we have laid far too much stress on research, and much of it is beneath contempt. Two think the production of theses is coming to be too much a matter of routine. One says much of this work claimed original has no interest or value in any field. One thinks the thesis element has been overdone, to the neglect of mastery of the subject matter. Another says that it has resulted in a forced stimulation of mediocre men. Four say in substance that we have laid too much stress on research here, one says especially in literary subjects, where philology unfits to teach literature.

On the other hand, another president of one of our largest eastern universities says without the stimulating influence of research as represented in theses our universities would dry up within a generation. Five think we have not stressed the research idea enough in the thesis. One says the man who is not a productive scholar will soon cease to be an inspiring teacher. Another thinks the thesis should not be assumed to be a substantial contribution to knowledge, but should only show that the candidate has acquired the spirit and technique of research, and this cannot be over-emphasized. Another says that enthusiastic students should be allowed to work over old material, if they do it in a fresh way, instead of being expected to contribute to the advancement of knowledge. Another says that the thing to be chiefly considered is the development of the student's mind and that the production of new results should be a by-product. Another says the chief thing should be to throw the scholar upon his own resources and to get his mind into independent activity. Two institutions have a research committee that passes on all projects and makes appropriations for apparatus and publications, to avoid duplication and to weed out weak projects. One reports this has worked well for three years, and suggests an inter-university committee for this purpose. One insists that every graduate student with any capacity should be directed into research channels and those with large gifts should put a larger proportion of their time into it.

As having been responsible for some ninety theses in the last thirty-three years, I doubt if any statement whatever can be made concerning the value of this work that holds for all, or even a majority, of these cases. Not only universities themselves, but departments in the same institution, and even individual instructors in the same department, and especially students themselves, differ immeasurably. As I list my theses, I should say roughly that one-third of them have little value but that the best third do represent something of real, and

some of them permanent, value. Perhaps a quarter have been the basis of the subsequent life-work of the candidates, as has been so often the case, from the theses of men like Schopenhauer and Nietzsche down to President Wilson's "Congressional Government," the outline of which he prepared in Washington in 1883 as a Hopkins thesis. May not the following be suggested as the questions here?

1. Have we instructors given sufficient attention to the wise selection of fruitful, central, stimulating topics, and taken sufficient pains to fit them to the individual interests and abilities of the students? The masterpiece of the medieval apprentice, we are told, was often a joint work of himself and his master; and so should not our theses represent good team-work between the candidate and one or several of his professors? This selection and fitting of topics to the individuality of the student has been compared in importance to the selection of a wife.

2. Have we realized the radical difference between the powers involved in acquiring knowledge and fitting for examination, which represents docility on the one hand, and the active, creative powers that produce, on the other? Some graduate institutions have reported that young men who came to them from colleges where drill and examinations prevailed, and whose marks were high, so lacked trust in their own powers that they had special difficulty in attempting research and in getting their minds into spontaneous activity. One professor says in substance that we must recognize that the graduate student who comes to this work is like a babe just born into a new world, and has at first to be nursed, spoonfed, and helped to walk alone. Royce compares research to play, with the implication that students too inured to a system that over-stresses receptivity are like city children who have to be taught to play, for the joy of investigation he identifies as the play instinct at its best and highest.

3. Do we not go astray if we look solely to the advancement of science in thesis requirements, although this should never be neglected; and does not the higher education essentially consist in finding some kind of ability in each where we can safely give the young man due confidence in himself, without implanting the conceit which is a danger only to shallow minds?

4. Cannon apparently regards this spirit of investigation as the chief criterion of the man who can be truly called educated in our day of specialties and compares at some length the spirit of research to the reawakening of the naive curiosity of

children which is usually dulled as the "shades of the prison-house" close in upon them. Adler and Janet think that something of this kind is necessary as a palladium of individuality, to relieve young men of the danger of an unconscious sense of inferiority, in the vast world of science to-day, and to give them a wise sense of ignorance, of humility, and their own limitations. One psychologist compares the first experience of research to the first taste of blood to a young tiger, and thinks that the more successful he has been in the special field of his research, the more docile he will be in every other field.

5. If theses are poor, is it not the fault of both the instructor responsible for them and perhaps of the attitude of the institution itself toward research? Have we a right to give fellowships unless we can give a great deal of personal weekly, if not daily, time to each student? It is a principle of the modern charity, which is to-day a science as well as a virtue, that we have no right to give doles to beggars without some agency to follow up each gift and see that the recipient makes the most and best of it. Can an academic teacher assume a greater responsibility than for the initiation of a bright and more or less trained young man into the field of a scholarship that is productive? Are we heads of departments not, therefore, personally responsible for the now many-voiced criticism that young Ph. D.'s are not good teachers, and could this not largely be remedied by a choice of thesis subjects which have at least one large frontier of high culture or at least of great practical value?

II. Should universities discriminate merit on diplomas? Here the answers differ. One university would insist upon three degrees, pass, *cum laude* and *magna cum laude*. Three would have only pass and *cum laude*. Most would not discriminate either on the diploma, the commencement program, or in presentation. Two would develop the English system of passing as distinct from honor courses and grades. Four institutions are uncertain. Eleven make no such discrimination, opinion being perhaps divided. One says that the private, personal commendation of the professor is enough. One thinks the public does not favor such discrimination. One thinks such discriminations good for undergraduates, but would have done with all this in the university. Three think superior men and merit should be signalized in every way. One thinks that superior men should be rewarded only by positions on the staff, another by having special privileges. Three think discrimination bad because it tends to lower the pass requirements for mediocre students. One says it is against the spirit of democracy. One thinks it is impossible

justly to grade thesis work. On the whole the burden of opinion seems rather against it.

The data suggest that one reason for the rather predominant opinion against this discrimination is the desire to escape from the incessant and excessive marking and grading of everything in undergraduate as well as in all school grades, so that the sentiment is in this sense reactionary, illustrating the law of compensation, in which psychology is now so much interested. One argument against this discrimination is that it would cause undue rivalry between departments to have each seeking to show the largest number of Doctorates with honor. If such distinctions are made they might perhaps be referred to such a research committee as Minnesota has established, or possibly made later by some inter-institutional research committee, if such is ever formed.

III. Are young instructors gifted for research sufficiently freed from routine work, examinations, etc.? Here too answers from the different institutions differ widely. No one reports that the conditions in this respect are entirely satisfactory. One says generally so; one not as a rule but often. One says sometimes yes, sometimes no; another that it is hard to answer. One says only a few are so freed; another that they are not always free. One says no young instructor is so overburdened that he cannot investigate. All the rest agree that improvements are necessary here. One large eastern university says this is one of the most unfortunate circumstances connected with the academic career. Such young instructors, fresh from their Doctorates, are full of enthusiasm, but are compelled to exhaust themselves in elementary teaching, examination work, marking, etc., and soon lose their capacity for investigation. Another says that usually we kill creative ability and investigational initiative by overloading instructors of promise. Another says such men are commonly loaded with details who could be more profitably employed in investigation and research, and adds, "I have known good investigators spoiled in order to make poor teachers and vice versa." One president defends existing customs because the beginnings of an academic career should be made difficult to repel weaklings. Many report that such young instructors, as soon as they give sure indications of ability, are favored, either by reduced teaching schedule, by appropriations, apparatus, sometimes absences, and in one institution by increased pay, and in several by more rapid promotion. The overwhelming consensus is that there is here a grave evil which it is very difficult to overcome, owing to lack of funds and to the necessities of teaching. Several jour-

nals have opened their columns to pathetic stories of young men who entered the academic career with high hopes and great enthusiasm, but have been disenchanting and lost all hope of realizing the ambitions that were so strong when they received the doctorate. In one case a young instructor in a large institution was given several hundred sophomores whom he had to teach the same lesson, in three divisions, and did not leave his chair from nine to twelve; he also had to mark four theses, two semi-annual three-hour examinations, and four sprung examinations, for each member of the class. This, of course, is an extreme case. Several institutions insist upon the earliest possible discrimination between those gifted in teaching and those gifted in research, and insist on equal value of these services, equal recognition for eminent success, while two would especially favor those able to investigate.

This problem has some points of analogy with the docent problem in Germany which, since the organization of the docents at Strassburg in 1906, has produced such a flood of pamphlets. It was found that younger instructors on a tentative tenure outnumbered the *Ordinarii* or full professors often three, and in Berlin four, to one, and that they were doing more than their share of the work of the university teaching and often of research, often receiving no pay save fees, with no seat or voice in the faculties, or even in the examining boards, all with academic hopes and expectations, but the majority of them doomed to disappointment. Some of them were the sole representatives of important departments. This academic *Nachwuchs*, as Eulenberg was the first to designate it, was due in that country to the same courses that have brought such a multiplicity of young instructors on a limited tenure to our institutions, namely, to the great and sudden influx of students, the number of whom seems to have about doubled in the last quarter century. After a long and bitter discussion, four leading universities in 1913, led by Göttingen and the projected University of Hamburg, reconstructed their constitutions more or less radically, giving these young men, some of whom had toiled a decade or two (one of them forty-one years) in hope of recognition which never came. Other universities have followed since, so that young men in important departments have equal rights with full professors and others nearly so, and many of these abuses have been remedied. These young men everywhere, as in this country are, of course, the hope of the future. Their ideals are the best material for prophecy. Their enthusiasm and power of sustained work ought to be at its highest and best, and I think no question is more worthy of serious consideration than the

nurture and facilitation of the large and growing body of gifted young men of this class in our American universities. The docent system has been tried in this country, but our conditions make it difficult if not impossible. Perhaps, however, it may be said that if young men of great ability and promise, who represent desirable topics, new or old, were allowed to enter the lists, even competing with senescent professors in their own departments, on anything like equal terms, great good in the way of helpful and needed stimulation and rejuvenation might result in some cases. Are we treating these young men fairly? To fully answer this question would of course involve a discussion of the general methods of instruction and might raise the question whether or not college methods did not follow too much those of high schools, and whether university methods were sufficiently differentiated from those of the requirements of the Bachelor's degree.

IV. What, if anything, is or is to be the result of the war, and perhaps of the changed attitude toward Germany, upon research in American universities? Here I may mention that Mr. A. Hafner, from whom so many of us receive our foreign publications, writes us that "about one thousand French and German periodicals have suspended publication on account of the war, and about fifty per cent of those being issued are reduced in size." He adds that most scientific publications have suffered in quality because so many of their contributors doing research work have been sent to the front, so that the only new research now being done is in the field of medicine. He adds that since March practically all the continental publications have been kept out of this country, that his firm has been able to secure only sporadic copies. I may add that our own list of German publications numbers 193, that we have paid for those of 1916, but not a copy has been received since May 8, 1916. They are lying in bales at Rotterdam and the British authorities refuse the permit for them to be forwarded. Appeal was taken to the British Embassy who referred us to Sir Richard Crawford, the British trade adviser at Washington, who simply told us we could apply and he would forward our request. This we did, but were told that the British authorities would not entertain applications at present. Our situation is doubtless identical with that of all the other universities of this association, so that the question might be raised whether it should consider any action in the premises.

One large university expresses the opinion that it would do Americans good to be separated for a while from the sources that flow from Germany. Eight other universities believe that

this will or should stimulate us to greater activity in investigation, to make good the shortage of intellectual wares made in Germany. One thinks the war has greatly affected our conceptions of the intellectual status of Germany, that American students are feeling that American universities are equal to or better for them. It has made us conscious of our intellectual status. Another says it will lead us to more originality of all kinds; another, we shall stand more firmly on our feet. Another thinks it has stimulated to appreciably greater activity in intellectual research, not only in its relations to industry but in pure science. Another insists that the war throws greatly increased educational responsibility upon American universities for stressing research. This president adds that nowhere has there been such intellectual waste as in German universities, that the war will force us to a new educational work, bring higher standards, and a sense of responsibility hitherto unrealized. Our universities will come into a larger being on account of the European War. Another thinks the opposite effect is possible, that the stoppage of scientific supplies from Europe deprives us of one of our greatest stimuli, and that everything may drop to a lower level in this country as a result. Four insist that American universities have an opportunity now opened by the war that is fully as great as that which it has afforded to manufactures. One doubts whether we shall have insight or ability enough to realize its fruitage and says that the spiritual and intellectual uplift which ought to come now will only be for nations that have the vision and are willing to pay the price of its realization. One insists that scientific research will be incalculably stimulated, that as it has aroused manufacturers to see the importance of scientific investigation in approved fields, and to improve and cheapen methods of production, the same result will follow a little later in academic fields. One believes that the war will make research here far more utilitarian, as war is said to have done in Japan. Another expresses the opinion that if Germany does not continue to lead in research after the animosity toward her, which is sure to be short-lived, is past, we may well fear for the intellectual future of the rest of the race.

It is this stimulus to greater activity that has largely led to the organization of the National Research Council in September, 1915, in the work of which we are all so interested. It proposes "to render the United States independent of foreign sources of supply liable to be affected by war." Some fear that science will be criticized for its part in the war, and it must also repair its damages. In a public address of the

president of one of our institutions he emphasizes the fact that war has created a great opportunity for us. Who, he says, can make good the let-down of the tremendous development of science for which Germany has been responsible? What universities can assume the burden that the great French schools have lain down or that the English universities must forego? The loss of academic talent is incalculable, and to carry on our present standards of life requires a constant stream of vigorous men and a constant outflow of scientific activity from our universities. More and more depends upon this and its cessation means paralysis. We are affected more than any other country, so that there is a new call for our universities to become the center of the intellectual life of the next generation. We must stiffen our intellectual fibre. There must be a more serious moral purpose. Our primary ends should come more to the fore and our secondary interests be less stressed. If the war does irreparable damage to the intellectual life of the world, the primary sources of investigation on which creative work must be done, should be transferred to this country and be developed here. He adds that our universities need a revival of true religion and spiritual ideals, thinks that the war has shown *Kultur* to be a failure, and has shown religion to be ineffective. Hence if our civilization is to stand the awful shock we must go deeper down to the real sources and begin by realizing that our universities have not done their full duty in ministering to the next generation. The intellectual burden of the world must now fall largely upon this country.

Such views are greatly emphasized by present conditions in Europe. Last spring 30% of the teachers in all the German universities were in the war, and even 30% of the courses were suspended, and no less than 64.2% of all students, although registered in the calendar, are *im Krieg*. A Marburg pamphlet says that most of those at home are incapacitated from military service, and even indicates that they are so by their own fault. Still more significant in this respect are the deep and far-reaching changes in all curricula in the direction of immediate practice, not to say material efficiency. We are told that Germany is feeling her school system, excellent as it is, quite inadequate. It is establishing a clearing-house of educational information and practice, suggested by but far more elaborate than our Bureau of Education. The old Suvern Bill is revived, which ensures free progress from the very lowest *Volksschule* to the university, removing the present gap which isolated the *Volksschule*. This proposal, if it prevails, remits all fees from the kindergarten to the Doctorate. Thus a new

type of *Einheitsschule* with a unitary basis but with rich differentiation for different goals is proposed, based not on the pocketbook but on abilities. Some insist that in this way not only will efficiency secure educational rights for women but will even harmonize if not unify military and educational influences. This program, too, entirely severs the control of the church, even from the lower school. In 1890 the Kaiser wished schools to be German rather than classical and these programs realize this wish to an astonishing extent, and it is not uncommon now to read disparagements of ancient culture. Many new courses by professors that remain are introduced, also, in the university, suggested by the war, such as those on the origin and nature of modern *Kultur*, Islam and the Orient, relations of Germany to Christianity and the East, international and military law, economic and other problems of war, pressing needs for economic expansion, and social courses, even on eugenics and child-bearing, while of course medicine has found a vast new field.

In England, too, education after the war is likely to abandon many ancient topics as luxuries, and to become more practical. Greek, it is claimed, should be given entirely to the specialists, and Latin to those who need it and are gifted. Precedents seem likely to be swept away. A plan now likely to prevail makes one modern language obligatory, preferably French, even in the popular schools. Geography is to be expanded but made mainly commercial. History is to be more modern and contemporary. German, we are told, will be neglected for a time, but should be diligently encouraged "in the interests of future harmony." History will be economic and biographic, with great attention to political institutions. Education will have to be practical because the national resources have been mortgaged for so long a future. The war will not end with peace and the schools must begin where the armies stop. In a recent Parliamentary discussion, Lord Haldane insisted that the schools should stress science if they wish to give England the skill which had made Germany so dangerous even before the war as a competitor, while Lord Cromer and Bryce objected that in Germany alongside its material efficiency had been a deterioration of character due to the turning away of the younger generation from humanistic studies. In this spirit the government has appointed a committee of the Privy Council for Scientific and Industrial Research, and also an Advisory Council to propose schemes. To encourage this kind of research the committee proposes 350 scholarships each year for students of the secondary schools who intend to pursue scientific or industrial subjects

in the university, these scholarships to last three years and the estimated cost of this entire movement is placed at 339,000£. Special effort is to be made, too, to detect talent early. This Council is in the line of, if not suggested by, the Kaiser Wilhelm Society of 1910, for the further advance of science in institutions of research, and this has lately resulted in the establishment of a Research Institute on a large scale in Berlin with Emile Fischer at the head.

Must we not infer from all the great new developments of the last few years in this field that the attitude of American universities toward research is a question that overtops all others and requires a new and wider orientation than we have yet given it? The Association of American University Professors is demanding complete academic freedom, and it is very fair and proper to press upon them the question what they are going to do with this freedom when attained to their satisfaction. So to the university in this country, which has existed only since 1876, and is now progressively attaining proper differentiation from the college, the question is what we are going to do. This is too vast a question for any individual or perhaps any single institution to answer, but must be wrought out by the slow consensus of the competent. Can the university free itself sufficiently from the old traditions of the college and learn to give not merely opportunity, but what is far more important, incentive, to research, which is so important a function? I see no way but to give to each department a degree of autonomy and independence of administrative control unknown on the college level. The revolt against presidents and deans a few years ago was largely led by professors of high university grade who were right in defying undue central control. So, too, rules of one department often do not apply to those of another, and there is not infrequently a tyranny of the faculty majority. One university in this association requires only a minimum of two hours a week teaching, and this has worked well for a quarter of a century, and most if not all of the instructors, save those who are new to the business, do more. The great problem is, will men given all this liberty and opportunity keep up their initial ardor for productivity, or sag toward a Carnegie pension or Osler chloroform, crossing the dead-line, so broad that it is hard for their colleagues and even themselves to realize that they have done so? Research is indefinitely harder than almost any amount of teaching. One writer says that the investigator must constantly keep himself in a state of exaltation, illustrating James's "higher powers of man," and that having once tapped these great reservoirs of enthusiasm, age cannot

quell them, but they go on till death. To say that ability cannot be repressed or that this problem will take care of itself is a counsel of ignorance and ease. England and Germany both have new institutions designed to pick out gifted children in the schools and facilitate their advancement, regarding them as the most precious of all the national resources. For many years we have given vast attention to dullards, defectives and morons, and the question may well be asked whether universities also do not give too much consideration to the lower half of our academic groups.

V. Despite the great and rapidly multiplying institutions devoted solely to research, of which there is now a long list, where the investigator has no other duties and everything—books, apparatus, assistants—can be had by pressing a button, I see no ground for fear that these will ever interfere with investigation by universities. Perhaps a national university at Washington as a culmination of state and agricultural institutions, to prevent vast resources of the score of institutions from going to waste, to eliminate duplication of work between departments there, as President Dabney now urges doing for the national government something like that which the University of Wisconsin has done for that state, which would be a bureau of legislative reference and information, a clearing-house for students, federate societies, and, indeed, realize all the dreams about it, from Washington and Jefferson down to those of the late President Gilman when, in 1900, he undertook to preside over the Washington Academy and the memorial association, might be made to meet the needs of the situation. Despite all this there can be no real danger from any of these sources to university research. Colleges may compete for students and money, and there may be too many of them, but there is a sense in which there can be no competition but only rivalry in research. We have only just begun to know nature and man, and to draw upon their latent resources. Our descendants will look back upon our ignorance with the same *d'haut en bas* pity with which we do upon the attainments of our forbears. We cannot possibly have too many institutions or individuals engaged in research. In his recent little sketch of the history of learned academies, George Hale tells us that the great installation of learning which began with the enormous endowment of eight hundred talents, made by Alexander the Great to his teacher Aristotle, and which was the basis of the school at Alexandria, which lasted on till the fall of Constantinople, where, we are told, one thousand investigators were studying animals alone, and with its library of eight hundred thousand volumes, this, he

says, is still a model to be striven for to-day. So we are told in many respects were the great academies of the seventeenth century, many of them based on earlier secret organizations with their scores and sometimes hundreds of local branches, to which not a few of the early universities owed their origin. In his history of them Merz says in substance that not only able but often mediocre men, by the associations thus established, made important contributions to science. Surely there is no danger of too much research, and those who fear this now would have opposed the Renaissance in its day.

VI. Many, however, and finally, do think they see a real danger that investigation will be led captive by industry and that the distinctions between pure and applied science may be obliterated, and that research will get into dangerous proximity to the patent office. They point us to the corporation schools, in some respects the most significant movement of our day, the fourth volume, containing the proceedings of the fourth annual meeting having just appeared. They point, of course, to the Potsdam *Anstalt*, at the head of which was Helmholtz when he died, who was said to have gone over to the "*Technik*," which offers the best equipment and the service of the best men to every industry. They point, of course, to the Ludwigshafen dye-works, with their four hundred buildings, five thousand workmen, and three hundred and fifty university trained chemists, to the Bell telephone research department, with a staff of five hundred and fifty engineers and other scientific graduates from over seventy institutions, and to a few dozen other great industries that are placing themselves more and more under scientific guidance, although in general this movement is little developed in this country. Robert Duncan, whose name has become almost a classic, since his death, in the European literature on this subject, and who devised the method of the Mellon Institute (which, as all know, takes on the study of industrial processes of any kind that science can help), makes the transfer to manufactures of a method which was well developed before here in agriculture. Such movements cannot possibly go too far. They are necessary, as England is realizing in its parliamentary reports, for national safety and preparedness. A nation that neglects them can never survive a long or serious modern war. We must admit that the line between pure and applied science is not quite as clear as it was. The severe strictures which Edison passes on academic physics and chemistry, and which Burbank is said to feel towards botanists, is factitious and can be only ephemeral. Marconi cherishes no such feeling towards Maxwell and Herz, who made his inventions possible. We

university men are fond of reminding ourselves that but for Langley the development of aviation by the Wright brothers and their successors would have been improbable, if not impossible. Jacobson tells us that the Teutons have succeeded for two years against the rest of Europe by utilizing the results of the researches of one man, Haver, on the fixation of atmospheric nitrogen, which enables them to obtain nitric acid in enormous quantities, that had this process been known outside Germany, the war would have ended by this time, and all countries would have been spared millions. Pasteur's researches which saved industries in silk, sheep-raising, the making of beer, wine, are another classic case. The history of indigo of which Germany two years ago exported twenty million dollars' worth to Asia alone, goes straight back to Liebig, Bayer, and to Kekulé's work on the arrangement of atoms. Optical glass, we are told, resulted from the scientific study of Abbe. Mr. Hetherstone has recently given us a little sketch of many such cases, and shows how often great discoveries are made by young students and sometimes even by chance. Daguerre had no more vision of the great value of his discovery than Faraday did when he showed his wife his first dynamo. The history of research shows that some of the best of it has had a purely humanistic motive, especially in medicine, and here we have a marvelous list of achievements impossible without special facilities for research.

But the highest and strongest motive that seems to have underlain much of the best research in all its brilliant chapters is the pure love of truth for its own sake. Many of the greatest discoveries have lain dormant for decades before they found any application, and to the latter their authors were often indifferent. There is something about the gratification of high intellectual curiosity which some people think knits the brain up into a closer unity than anything else. But to ask what happens, why and how, why does the top spin, roots grow down, animals breathe fast when they run, etc., to be able to order, harmonize, penetrate into the secrets of the world, to be ready if need be to "slay a beautiful hypothesis by an ugly fact," to feel oneself, in Fichte's language, the priest of truth and in her pay, ready to do and suffer all things for her, and especially to know by personal experience a little something of what the Eureka glow of discovery means,—this in itself constitutes the higher education of to-day. It is capable of generating the enthusiasm of young men to a degree which students of their nature ever since Plato have pointed out as their chief need. The great question of higher education is to satisfy this crethic need of young men. Calentures

they must and will have. The dull routine of lesson-learning and reciting kills it, but the spirit of exploration and inquiry precisely meets this need. Kepler, Cannon reminds us, after twenty years of study on a topic, says that only eighteen months ago did he get his first glimpse and at last he made his discovery, and this is the way he writes of it: "Nothing holds me. I will indulge my sacred fury. If you forgive me I rejoice; if you are angry I can bear it. The die is cast. The book is written, to be read either now or by posterity, I care not which. It may well wait a century for a reader, as God has waited six thousand years for an observer."

VII. Is not a vast and new responsibility now laid upon American universities, along with a call for a new independence of the past and of Europe, and must we not henceforth find or make our own way to a new leadership of Western civilization? I cannot fear the danger of Garyizing our universities, even though we have just learned that one institution has founded a Bureau of Salesmanship Research, with a fund of \$75,000 provided by business concerns of its city. Too much of the life of the community cannot flow through our institutions. Research should and will be their vital breath, their native air. The instinct of research is too strong in human nature to be overwhelmed. In the middle ages persecution compelled it to elaborate secrecy, but hardly damped the ardor of its adepts, and so now neither commercialism nor academic drudgery can permanently check or divert it. In this pragmatic age utility has an inspiration of its own, and a long list of achievements to its credit. There is a large sense in which science is service and discovery a higher philanthropy, but there must be leisure which we forget is the very meaning of the word "school," and the great investigator must always cultivate a little monastic aloofness. Fichte said that the spirit of tireless research was the most sacred thing in the modern world, the most authentic voice of the Holy Ghost, that no one could speak of it without enthusiasm, and to disparage was to blaspheme. But I must end in a collapsing way by confessing inability to answer the question assigned upon the program. The problem can only be solved by the slowly evolving insights of the growing number of those who have a vision and so I conclude with the following rather paltry queries.

1. Can we not make efficiency in research the chief criterion of the admission of new institutions to this association? One applicant presents an impressive list of schools, departments, numbers, wealth and growth, but says nothing of this. Another large state institution, that has not applied but I am

told intends to do so, has just said through a committee that "an institution devoted to imparting knowledge without any effort to add thereto, no matter how varied and seemingly efficient its departments may be, does not deserve the name of a university," and proceeds to outline a definite policy of productive work, specifying that every university should have a group of notable creative scholars, that no man should be a full professor who has not given evidence of continued activity in scholarly researches since his original appointment, that teaching hours be reduced for all those qualified for or engaged in productive research, that if a man of high character and attainments be made professor it should be left to his own discretion to determine how many hours it is expedient for him to teach.

2. Should not each institution with a department of education add to the work that now includes only grammar and high school grades, one or more courses on the history of science, of learned academies, universities and colleges, their policy and the higher pedagogy generally. I know of only two attempts in the country ever made in this line. In one it was proposed but the president thought it might not harmonize with its administrative policies.

3. Can we not relieve young appointees fresh from the Doctorate from the monotonous and grinding drudgery of marking examination papers and excessive teaching?

4. A number of eminent professors in different institutions believe that there is a vast and as yet largely unexplored field for raising money, instead of for buildings and enlarging methods already operative, for researches of a specific nature, and as we all know, some recent donations for such purposes give hopeful indications in this direction.

5. Should not administrative officers have some special agency enabling them to keep in touch with the now many new schemes of developments in this field; for instance, the apparently simultaneous proposals this year from two sources for an institute of political and administrative research, on the plan of the Mellon Institute, for studying a long list of practical problems detailed in the two plans?

6. The National Research Council of the National Academy of Sciences, and the Committee of One Hundred, who have wisely begun their labors by attempting an inventory of all the various funds in the country available for research, and which planned both to coordinate it, clearing-house fashion, and also to stimulate it, not only for institutions but for private investigators, seem perhaps now the most hopeful agency to this end, under which we shall all want to cooperate and

in years this Council and Committee may be able to give some authoritative answer to the problem.

7. Finally, should not professors and departments, just in proportion as they have demonstrated their research power, be freed from administrative control, and be given complete independence? Some deans and presidents are successful investigators, but do not these functions tend to be mutually exclusive? Should not a man of this power be allowed to teach or not teach, examine or not examine, be present or absent, promote his advanced and promising students in whatever time and way he sees fit, and thus be a law to himself, and his department and its conduct be emancipated? This would of course produce great diversity, but is not this needed? In other words, can we ever have successful academic research till it is allowed complete autonomy, unhampered not only by officials but by general rules or faculty majorities?

EDUCATIONAL CONTROL OF THE PRE-SCHOOL PERIOD*

By WILLIAM L. DEALEY, Providence, R. I.

The slow development of public school control over the child should include as a further radical advance, advisory control of the pre-school period. An adequate conception of child growth implies this extension. Supervision of the pre-natal period by agencies for conserving postnatal infant life, presents a ready parallel. The welfare of the child is "dependent in its origins upon ante-school conditions." From the medical standpoint, these conditions are not controlled because an unfilled gap lies between the infant-welfare centers of the first year and school medical inspection in the fifth. According to Forsyth, inspection points to widespread physical deterioration during these first five years, leaving the majority of children with serious but preventable defects. These defective entrants must be restored at high cost. As medical control is only a phase in the educational control of this period, this neglect represents inexcusable inefficiency on the part of school systems.

PHYSICAL WELFARE

The first essential in medical pre-school control is to protect from contagion at any cost. The child's protection is so poor that Burnham¹ notes lymph alone is adequate; the epidermis is frail and unprotected; body cavities lack mucus with bacteriacidal properties and epithelial layers are less resistant; as a second defense the dermis and subcutaneous and submucous cellular tissue afford inferior protection. The blood is less resistant because less alkaline and with less bacteriacidal power (Weill): at birth but 28 per cent of the leucocytes apparently possess bacteriacidal power, at one year 40 per cent, at the third year 54 per cent (in adult life, 70 per cent). If its tissues are attacked, resistance is further lessened through the constant stress of growth. There result

* This study is a digest of related literature, such as the Tabular Statement of the federal Children's Bureau (E. R. Goodwin, 1916), or the Annual Proceedings of the American Association for the Study and Prevention of Infant Mortality (Baltimore). Facts are quoted to illustrate tendencies, not to present detail.

¹ Cf. Burnham, W. H.: *The Hygiene of the Kindergarten Child*. Proceedings of the National Education Association, 1904, pp. 416-22.

in the pre-school period from 1 to 5 years, roughly 88,400 deaths in the United States (1914). As the degree of protection increases with age, this mortality follows a rough curve of 52, 23, 14 and 11 per cent in its decline from 1 to 4 years. Child disease is admirably illustrated in measles, as after-effects may be serious and probably 80 per cent of the fatal cases are under 5 years.² Examining 5,538 entrants to the Chemnitz schools, Thiele found 64 per cent had undergone measles.³ Burnham instances 1,077 fatal cases of measles in Munich among 28,988 cases, 21 per cent were fatal in the first year, 5 per cent from 2 to 5 years, and only .4 per cent from 6 to 10 years. Tuberculosis, as a further instance, in its inception is a disease of early life. Fisher has computed the preventability for diseases with the median age of death under 5 years; for example, diphtheria 70 per cent, diarrhea 60, broncho-pneumonia 50, whooping cough 40, or measles 40; for diseases with a median age at one year 47, and for other diseases of childhood 67 per cent. This excessive mortality is a rough index of the far larger numbers who become defective⁴ during this pre-school period.

Periodic medical inspection is therefore essential to any control of the child and its pre-school environment (the home). To this end, the child's family should be coordinated with a unit of protective power stronger than itself, either a medical school inspection service or municipal division of child hygiene. School physicians, as in Cincinnati, may exercise a limited supervision by allowing children to bring their little brothers and sisters for examination. The extension of such supervision implies health centers in the schools. Illustrating control by child-hygiene divisions, Buffalo cooperates with the Babies Milk Dispensary Association, to follow the child till school age through infant-welfare consultations. The full development of such centers, as child-welfare stations, would supply an exceptional mechanism for monthly examina-

² For example, among 33,917 deaths at 1 year, 8% were of measles, 6% tuberculosis, 5% diphtheria and croup, 4% whooping cough, (29% general diseases); among 15,364 at 2 years, 12% diphtheria, 7% measles, nearly 7% tuberculosis (40% general); among 9,498 at 3 years, 46% general, chiefly diphtheria, 16%; among 6,915 at 4 years, diphtheria 19% (general, 49%). Deaths from diseases of the digestive system, startlingly high in infancy, at 1 year are still 29%, declining to 10% at 4 years. Of deaths at 1 year, 27% were through diseases of the respiratory system, decreasing to 15% at 4 years (1913).

³ Cf. Burnham, W. H.: A Health Examination at School Entrance. *Ped. Sem.*, Vol. 21, 1914, pp. 219-41.

⁴ Cf. the typical physical defects found in school medical inspections, for instance, adenoid growths resulting in arrest or defective teeth causing infections.

tions until school age. Although the majority of 71 organized consultations for well babies limit to 2 years, 9 receive until school-age and 8 place no limit. The Babies' Milk Fund Association of Louisville in its 6 infant-welfare stations provides weekly conferences with intensive home care till 3 years, and instructive supervision to 5 years, when children come under school nurses in the kindergartens. Conferences are provided from 2 to 6 years at 4 stations of the New York Diet Kitchen Association. The Chicago Woman's City Club (1914) also promotes fortnightly classes into which mothers with children 2-6 years of age are graduated. The Grand Rapids Clinic for Infant Feeding, for instance, places its age limit at 5 years; so does the Baby Milk Supply Association of Lexington (Ky.).

The remarkable present development of agencies for infant care and their inherent educational possibilities, are scarcely appreciated by schoolmen. The essential supervisory center during infancy is the welfare station which combines the milk depot with the infant consultation. At the consultation a trained physician or nurse systematically examines the infant before the mother, followed by home instruction under a visiting nurse. The station may distribute to mothers certified as unable to nurse, pure milk, either free or at prevailing prices, with instruction in home modification. Artificial feeding is thus discouraged. Goodwin found some 46 per cent do not dispense milk. Milk dealers should cooperate to provide instructive medical service for patrons.

As infant-welfare centers offer the mechanism for infant control, they are enjoying rapid development. Goodwin⁵ reports 539 summer (397 winter) stations, supported by 205 agencies in 142 cities (1914). These stations utilize 714 full-time and more than 152 part-time nurses in summer (488 full-time and more than 116 part-time nurses in winter). Approximately 43 per cent, however, are concentrated in the 8 largest cities. One infant-welfare station for each city of 10,000, and for larger cities, 1 for each approximate 20,000, is suggested.

In an important group of cities efforts are still almost entirely private, city health authorities cooperating chiefly by control of the milk supply. The Baltimore Babies' Milk Fund Association illustrates the effective private agency. Weekly consultations in 16 welfare stations reach 7,059 infants. Cooperation is encouraged from registration of birth until 3 years. Fifteen trained nurses are employed (3 additional in summer) in home instruction. The mortality of these babies was only 6 per cent (for the city, 12 per cent); 14 additional stations are required. The Council Milk and Ice Fund distributes whole milk daily to some 400 families. The Association enjoys partial aid (15%) from the summer hospital for babies, Thomas Wilson Sanitarium; and shares in the Alliance of Charitable and Social Agencies. In a second related group of cities, cooperation with departments of health is somewhat more extensive. Thus the Washington authorities provide extensive publicity, while the Diet Kitchen Association cares for 1,749 infants through 5 attractive centers for mothers.

⁵ Goodwin, E. R.: A Tabular Statement of Infant-Welfare Work. U. S. Children's Bureau, Publication No. 16, 1916. 114 p. This tabulation includes new and important data (1914).

In the more important present groupings, municipal departments include a large part of the infant-welfare machinery. After experimental demonstration by the New York Milk Committee the New York bureau of child hygiene now has 66 stations,⁵ dispensing whole milk, but becoming permanent educational centers promoting hygiene on a large scale. It is aimed to create parental attitudes making it as natural to visit milk stations as to send older children to school. The stations reach 38,427 infants under 2 years. This municipal bureau cooperates with every private agency whose work it in any way touches. The New York Diet Kitchen Association for example, reaches 5,046 infants through 8 district health stations, and certified milk is distributed at the price of ordinary milk. The Nathan Straus Laboratories maintain in summer 17 (in winter 8), pasteurized milk stations. The 3 practical feeding stations of the Babies' Dairy prepare modified milk for sick infants, and each reaches 40-50 babies daily. In fine there are some 350 agencies in New York. The Babies' Welfare Association affiliates more than 90 members. This clearing-house offers perhaps the most complete cooperation effected in this line of work. Through its offices in the health department, it systematically places discharged maternity cases under the care of stations. A map of milk station districts and uniform records eliminate waste. By bringing important relief societies and stations together, with the social service exchange, free milk is provided without the former delays of investigation. Since nearly all the hospitals and settlement nurses are included, a time loss is avoided in placing sick babies. The result is an "organized campaign, planned on scientific lines and carried out with business-like efficiency."

The Boston system turns upon a remarkable private agency, the Milk and Baby Hygiene Association, in close cooperation with Boston's division of child hygiene, whose 13 nurses observe all births registered. In 4 Association health stations, conferences are held twice weekly, in 8, weekly. The staff includes 23 child specialists and 15 nurses trained in infant care and social work. The number of babies supervised has increased to 4,679. Seventy-four per cent are now wholly or partly breast-fed; and, according to Murray, the death-rate has been reduced 27 per cent. The co-operative Baby Welfare Committee, representing the chief agencies, studies the field to avoid duplication; milk stations are districted and correlated with hospitals.

Cleveland has developed an elaborate interlocking system. The municipal bureau of child hygiene is directly affiliated with the central Babies' Dispensary and Hospital, under the same medical director and superintendent of nurses. The bureau has divided Cleveland into 15 districts, each with a prophylactic dispensary supervised by a trained physician. These stations reach 4,478 infants, but some 40 would be needed completely to cover the city. Each dispensary is correlated with the central Babies' Hospital. The latter includes a milk laboratory, and finances the distribution of milk; sick infants are referred to its physicians. General, dispensary, tuberculosis and school nurses are represented in a Joint Committee of Public Health Nursing. The Cleveland Welfare Federation ensures support.

In addition to these important systems of great cities, among random agencies, the flexible Babies' Milk Fund of Detroit varies its educational and nursing work according to the need in districts of high mortality; as rapidly as the municipal division of infant welfare is in a position to cover any district, the work is advanced elsewhere. Each maintains 4 stations. The Children's Aid

⁵ *Ibid.*

Association of Indianapolis has a successful solution of pure milk distribution. Milk is delivered directly into the homes by a large firm, after pasteurization from a selected tuberculin-tested herd. Its central clinic is within a few blocks of all car lines; 4 clinics operate the entire year, 4 additional in summer, and supervise 1,352 children under 5 years.⁵ The municipal authorities meet half the expense. Among cities with less than 150,000, the Syracuse Infant Welfare Association through 8 school nurses from the Board of Education, conducts 3 stations in public schools of crowded districts, and hopes to turn an increasing share over to the bureau of health. Under the Dayton (O.) health department and Visiting Nurse Association, clinics for babies are open in school houses in four different sections of the city. Dallas (Tex.) has developed the first welfare stations in the Southwest, the Infants' Welfare and Milk Association supervising 2,602 infants. A monthly subsidy is paid by the city, and the Association federated under the admirable Dallas Department of Public Welfare. Illustrative of cities less than 50,000, health officers of the Oranges (N. J.) organized the Baby Welfare Association, and laid out 7 districts. This association is a centralizing agency, affiliating the 6 private associations which complete the system.

There is a further group of cities which rely essentially upon their health departments. Pittsburgh approaches such a system through the 20 summer and 7 winter stations under its bureau of child welfare.⁵ Rochester's well-known system controls 3,691 infants in summer through the health bureau. This follow-up system includes 17 welfare nurses and 13 child-welfare stations located in public or parochial schools. The sale of milk has been discontinued. Supplies are furnished, unsanitary homes supervised and where necessary cleaned or screened.

Welfare stations may expand to deal with the entire family. Such a public health unit can focus all available agencies upon the families of a limited area. Milwaukee's first health center (1912) exercised for its district of 33 blocks, fairly complete postnatal supervision over every baby. The Philadelphia Child Federation maintains an experimental health center for the intensive study of infant mortality in one congested square, infant consultations (with 551 infants), further examinations of children 2-6 years, little mothers' leagues and boys' sanitary clubs, supervision of food products, and an intermediary rôle between neighborhood and city departments. Buffalo has 3 centers and would cover the city with such miniature health departments, following the lines of C. O. S. districts. The National Social Unit Organization (New York) now plans the intensive survey of limited experimental areas, for instance, in Cincinnati.

Classification of infant-welfare systems reveals the increasing share of municipal health departments. In 60 cities, 181 stations were operated by municipalities alone; municipal nurses instructed parents in 100 cities.⁵ The expense of conducting milk depots on a large scale is beyond private philanthropy. Divisions of child hygiene in 20 departments of health have given a remarkable impetus to systematic effort, and by cooperation with medical charities such divisions should control physical child welfare.

To this end, expansion is urgently needed. The New York Milk Committee was unable to secure reports of the previous year's infant mortality from 43 per cent of the 252 larger cities. Only 4 health officers could vouch for a rate below 50 per 1,000 births. Goodwin found 24 per cent among 555 city health officers did no

⁵ *Ibid.*

infant-welfare work, and 46 per cent felt limited to milk inspection. Similarly, Schneider's (1913) questionnaire from health departments in 201 cities, showed 22 per cent making no effort for infant welfare; 33 per cent of the smaller cities had no such plans, but 69 per cent of cities 100,000-300,000, and 94 per cent of larger cities had the essential features of a complete system. A most important cause for this neglect Schneider found in the low average of 33 cents per capita for health department appropriations.

Where the population is scattered, elective boards of public welfare or local health associations in counties or groups of counties might administer the work of state health departments. Kansas, New Jersey, New York and Ohio have specific divisions of child hygiene. State-wide organization is also supplied by private agencies. A department of the Wisconsin Anti-Tuberculosis Association, for instance, has concentrated on the infant mortality of the state; or the Ohio Public Health Federation, or Illinois Public Health and Welfare Association, are organized for one working state unit. Of national institutions, the federal Children's Bureau and the American Association for the Prevention of Infant Mortality (with 135 affiliated organizations), are among the foremost unifying forces in the infant-welfare field. To avoid the confusing educational effect of diverse campaigns upon the public and other overlapping, present national systems should affiliate in a strong public health league. The general American Public Health Association, American Medical Association, or the American School Hygiene Association, now emphasize child hygiene. The Committee of One Hundred on National Health (New York) hopes to unite all government health agencies in a National Department of Health.

The effectiveness of mechanisms such as infant-welfare or health centers largely depends upon personal instruction of mothers by visiting nurses. Simple, flexible systems of visiting nurses supplement the resident nurse among families of moderate means,⁶ and extend free, skilled care to the poor in their homes. In Providence, for example, the Visiting Nurse Association supervises children until replaced by school nurses at 4.5 years. Though reaching a limited number, such nurses are the most far-reaching preventive force in public health.⁷ The extension of their instructive supervision should be rapid, and if possible reenforced by state staffs of public health nurses.

According to Waters (1915) some 5,152 public health nurses are employed by 2,066 different agencies in district nursing, representing a country-wide network. Goodwin reports 198 cities with home instruction in infant hygiene by 466 full-time and 460 part-time summer nurses. Of the full-time nurses, 80 per cent are municipal; but

⁶ Wrigley finds 108 "hourly" nurses, for such families.

⁷ Neff (1911) reports in 4 congested Philadelphia wards, 8 trained nurses reduced the infant death-rate 27.3% (all wards only 11.8%). Baker contrasts the continuous supervision of home visits by nurses (60 cents per month) with the cost (2 dollars) and mortality (2.5%) for milk depot care alone (but 1.4% of 16,987 infants under nursing care died).

returns for part-time nurses are admittedly small, since the incidental work of a majority of the visiting nurse associations is involved. Waters' statistics which include 98 nursing centers under departments of health and 22 under departments of education also indicate the trend toward municipal nurses.

In the American Nurses' Association, three great nursing organizations meet, broadly co-ordinating all nursing systems. The American Nurses' Association is composed of 238 alumnae associations, 51 city or county and 45 state organizations. Through the efforts of these state associations, laws and curricula are drawn, training schools accredited and educational standards maintained. This state mechanism includes an examining board. The National League of Nursing Education contains about 500 active members, though representing less than half the total number of training schools. The National Organization for Public Health Nursing met for the first time, 1913.

Their first essential is a school problem, the training of nurses.⁸ This important group of vocational schools, as an integral part of hospitals, clearly suffers by its isolation from other educational systems. There are 1,250 training schools in the United States, with 36,120 pupils, a total capacity of 124,139 beds and a daily average of 80,078 patients (1914). The first striking fact is the persistence of low standards for admission. Nutting (1912) found 692 schools with all degrees from a vague "high-school" requirement (35%) to common-school preparation (28%). A longer probation in practical procedures is therefore necessary, possibly of 6 months, before entering the wards. Unfortunately, shorter hours have not generally followed the tendency to require 3-year courses. Nutting still found 45 per cent with 10 or more hours duty. Employees should release students from uneducative repetition in routine domestic service. Where possible, hospitals should maintain a salaried body of staff nurses, to increase the ratio of graduate nurses. At present for a minimum of instruction, student-nurses perform a maximum of service for the hospital. Not only classrooms or small libraries, but systematic instruction is often lacking. Nutting found 315 schools without paid instructors. Of 328 schools registered under the New York State Regents, 81 per cent have no resident instructor in dietetics. In remedy, such schools should either be adequately endowed, receive state or municipal aid, or cooperate with medical schools.

Increased teaching material is essential. The capacity of 692 hospitals, Nutting found to range from 5 to 500 beds. About 60 per cent average under 75 patients, about 25 per cent not more than 25; yet the minimum of the New York Regents is a daily average of 30 patients. La Forge mentions 22 hospitals with 1-3 months practical work in children's wards, and 3 with 6 months, but the average general hospital cannot afford such experiences. Such hospitals should employ affiliation with other training schools to consolidate the training system. Some 35 per cent of the hospitals, according to Nutting, also send their pupils into families for nursing experiences of 2-26 weeks.

The public health nurse should supplement such training by post-graduate specialization. Lacking scholarships (such as the Robb Memorial fund), the solution may lie in an adaptation of part-time or continuation schooling. Among post-graduate courses, 3-months' work in the New York Nursery and Child's Hospital includes the

⁸ A minor school problem is the training of nursery maids, in babies' hospitals, or even in day nurseries.

children's wards, observation ward, babies' clinics, the "boarding-out" system, or optional work in the diet kitchen. Home visiting which will lift families to a normal level also implies special training. To instruct the mother in feeding her children, for instance, requires training in economical dietaries.⁹ For such preventive social nursing, the post-graduate course at Teachers' College (Columbia) is an important development. This school employs active field work with district nurses and the health bureau. Similar cooperation between post-graduate schools and well-established visiting nurse groups exists in Philadelphia, Cleveland, or Boston; the Universities of Cincinnati and Ohio State also offer courses in public health nursing. A supplementary trend is affiliation with schools of philanthropy.

As these trends show that the training of nurses is about as poorly provided for as that of teachers, state registration should be an essential for pre-school work. Training standards and registration after examination are established by statute in 35 states (1915). Four-fifths are permissive, but 6 states believe they register more by compulsion. The future of reciprocity between state boards hinges on the standards of training schools. A national examining board for nurses should aid such standardization.

Generalized nursing is illustrated in Dayton (O.), where all nursing interests are pooled. Each nurse is a sanitary inspector, and cares for every case in her district. One nurse in a small district for all public health work is held to increase family confidence, prevent duplication and approach health problems as a unit. Lacheur found 100 nursing associations in smaller cities agreeing that the combination of infant-welfare work with general nursing was possible. Goodwin lists over 100 examples of part-time infant nursing in towns of less than 10,000. It is difficult to secure specialized nursing in small towns, and in rural sections almost impossible. The rural nurse of necessity may combine the functions of infant-welfare, tuberculosis and obstetrical nurse, sanitary inspector, school nurse, even charity visitor, probation officer or playground worker. Rarely is there specially organized infant-welfare work in rural sections. The cooperation of the rural school teacher, however, affords a direct approach to the mother's interest. Health supervision of factors such as sewerage, water, milk or other food supplies, is left to individual control. Mechanisms such as hospitals, clinics or district nurses are unusual. The Red Cross Town and Country Nursing Service has some 70 rural nurses in the field. The Visiting Nurse Association of Baltimore, for instance, has nurses in the counties of Maryland. The District Nursing Association of Northern Westchester County (N. Y.), with headquarters at Bedford, has divided its territory into 7 districts, each with a part-time infant nurse.

Generalized nursing, however, lacks the efficiency which comes from modern specialization. The family may still be considered as a unit by bringing together, preferably within the public school, all agencies at work in a district. Gerstenberger (1915) found that at least in Cleveland, among the families of 818 babies coming to the stations, from 87-95 per cent had been visited by but 1 organization in a given month, and among 500 families coming to the Central Dispensary, 79-89 per cent; while less than 1 per cent of the families received more than 10 visits. Similarly, in Chicago, according to Phelan, with

⁹ In a complete system the visiting nurse is aided by partly trained, inexpensive attendants; and her work supplemented by highly trained visiting dietitians, visiting housekeepers, visiting teachers, social workers and women rent collectors.

specialized nursing groups in 597 families, only 25 were visited by 2 nurses, and the question of duplication reduces to cooperation.

School nurses frequently assume infant-welfare functions. Under the Pittsburgh bureau of child welfare, they work the year round following infants from birth up into the schools. In New York, 200 municipal school nurses contribute largely to infant welfare, instructing little mothers' leagues, visiting in the homes and referring to milk stations. Chicago with 93, Detroit 15, Indianapolis 10, and among lesser cities New Haven with 7, further illustrate full-time summer use of school nurses. Among cities of less than 75,000, Jacksonville (Fla.), Kingston (N. Y.), Oshkosh (Wis.), or Dubuque (Ia.), employ the school nurse for part-time infant work through the year.

The intimate relation of visiting nurse service with dispensaries and hospitals, is most clearly revealed in modern hospital social service. Some social service departments maintain infant-welfare stations. In New York, for instance, centers of departments at Lebanon Hospital, Bellevue and Allied Hospitals, and the Mt. Sinai Hospital supervise more than a thousand infants. The social service department extends preventive activity in the homes. Thus the Babies' Hospital of Philadelphia affords follow-up care until 6 years for every child discharged. Their plan includes a card record showing physical condition from the period under care to school entrance, and the first physical examination under the board of education. The hospital is now following 900 cases, building the foundation for a large educational work.

In the brief period from 1905-13, according to Cannon, over 100 social service departments developed. This department is an integral part of the hospital process, and so preferably under hospital control. An important aid is an advisory committee, as at the Massachusetts General, or St. Louis and Chicago Children's Hospitals. A social diagnosis and attention to the social complications of the child's disease are intimately connected with medical diagnosis and treatment. The Milwaukee Infants' Hospital, for instance, investigates and corrects home conditions while the baby is at the hospital. Nurses of the unique Boston Floating Hospital investigate the home conditions of every child and instruct the mother in the home.

Some of the most successful social service is connected with dispensaries. Under the follow-up system of the Philadelphia Babies' Hospital, the mortality of babies discharged decreased from 22 to only 3 per cent. At the Boston Dispensary, children discharged are referred to the outpatient service equipped with a visible-file index, follow-up postals and home visitors. Among 245 discharged infants (1914) 25 per cent were well, 50 per cent improved and 9 per cent not improved; at the end of 3 months, 23 per cent were well and 42 improved; in 12 months, though living mostly in poor homes, 49 per cent were well, and 18, improved. The average result was a steady improvement, though 76 per cent of the cases involved educational problems in the home, and 89 per cent, family problems, such as illness, acute poverty or illegitimacy. Without such supervision the hospital resources would have wasted in readmittances through failure to convalesce properly, reinfection or intercurrent disease.

The dispensary is also an important part of the unified hospital process. It should become a center to which sick infants are referred from surrounding prophylactic milk stations. As random examples of children's dispensaries are, the Babies' Hospital and Children's Hospital departments in Boston; or in New York, of the Babies' Hospital, the Nursery and Child's Hospital and the Wilkes Dispensary of St. Mary's Free Hospital; in Philadelphia, dispensaries of the Children's Homeopathic Hospital, the Children's Hospital and St. Christopher's Hospital; or of the Washington Children's Hospital. Its general possibilities are suggested in a growth from 200 (1904) to at least 2,300, according to Davis (Boston Dispensary). His estimate, however, includes every form of clinic as well as about 1,000 treating general disease among the sick poor.

The infant ward or hospital, when correlated with the consultation for well babies, is an integral part of the pre-school system. For observation of the more serious diseases, accurate diagnosis, and the proper care of very sick infants, the hospital is essential. Many general hospitals handle children, but fail to appreciate their institutional requirements. The construction, equipment, organization and operation of a hospital for young children, as Holt points out, are quite different than in a hospital for adults. Infant feeding requires special equipment and specially trained service. The wards are smaller and with ampler provision for separation, young children are so susceptible to infections. Outdoor summer wards are used, such as the hospital camp of the Associated Charities, Washington, or the baby hospital, Memphis. The general possibilities of hospital control lie in 6,745 institutions caring for the sick (1914). Unfortunately there are no accepted standards of hospital efficiency. Gilbreth finds the usual conditions much worse from a managerial standpoint than in the average factory, and in some hospitals so bad as to warrant closing.

Where medical supervision operating through school or infant centers, visiting nurse systems or the social service of hospitals and dispensaries, is insufficient for the full control of early physical development, special consultations under either school or health authorities, should specialize in children of pre-school age.

A further device to control physical neglect among the infants of working women in cities, is the day nursery. The United States has enjoyed its rapid extension until 618 nurseries, according to Dodge,¹⁰ now have an aggregate daily attendance of about 30,000 (1914). The total number, however, is insignificant when compared with the need. Where the mother is necessarily absent at work, the nursery supplies immediate relief by supporting the child during the day. Such aid should be based upon investigation. As Dolbear suggests, intimate daily contact with the child affords opportunity for a social diagnosis of both child and family. On this diagnosis proper relief agencies may be utilized, the nursery becoming a clearing-house for preventive work. The

¹⁰ Cf. (Biennial) Proceedings of the National Federation of Day Nurseries (New York).

Helen Day Nursery (Chicago), for example, through its bureau of personal service investigates cases, and by house-keeping funds is enabled to clean up dirty homes. At the Fitch Creche (Buffalo) the kindergartner as a social worker visits all mothers; 2 New Bedford nurseries unite to employ a trained investigator for written statements regarding each applicant. Where loss of the father has broken the home, mother's pensions in some thirty states should enable the poorer mother to maintain her child. The spread of modern social insurance may prove even more adequate. As a makeshift for family care, most nurseries now admit an increasing number of children with both parents working. Some form of cooperative public nursery should extend to middle-class mothers. Gallichan suggests community nurseries as part of a program of state aid for motherhood.

The large cities are already forming systems of day nurseries, correlated by an association. In Greater New York alone, ninety-four nurseries with an aggregate daily attendance of 5,528, affiliate to form the Association of Day Nurseries; the Association of Catholic Day Nurseries includes fifteen. The Chicago Day Nursery Association comprises thirty nurseries (with 4,432 children) and makes fortnightly inspections. The Boston Conference is composed of twenty-seven day nurseries (nine in Boston). The Newark Association is standardizing the work of six nurseries, with municipal aid. The Sheltering Arms Association of Day Nurseries in Atlanta coordinates five nurseries.

The day nursery receives comparatively few infants under six months. Since its care centers upon children under six years, it supplies an essential gap in the supervision of children over one year in age. The best nurseries provide medical examination on admission, owing to the danger of epidemics. Among the twenty-three associated Philadelphia nurseries, eighteen record physical examinations and thirteen, the family health history.¹¹ According to Kerr, of 178 New York children, 114 were found to have physical defects and 109 were treated. To insure continuous medical supervision, nurseries should submit to the rules of the health department, as in New York with monthly visits by the medical inspector. In France all public nurseries must be controlled by a physician, under government inspection. A trained nurse should be connected with the staff of public nurseries. In Cleveland,

¹¹ A related agency for children from tuberculous families is the preventorium. Thus the fresh-air camp at Farmingdale (N. J.) boards New York children (4 years old) several months, during which municipal nurses make home conditions safe.

for instance, a regular daily inspection is made by the Day Nursery and Free Kindergarten Association. This problem is related to the control of kindergartens by school nurses.

EDUCATIONAL CONTROL

These mechanisms for the medical supervision of this period, such as extended infant consultations, visiting-nurse systems, hospital social service, or even the day nursery, derive their peculiar importance from the extent to which they become educative devices demonstrating to parents proper child care. Control of the pre-school period is an educational, not a medical, problem. Its development is tending toward an immense educational system, as yet unrelated, for parental training in infant care. Its educative devices in their lack of academic formulae and their realization of learning through participation in live and essential situations, exemplify future school activities. Such a movement not only embraces the public school, but is a virtual continuation of it. The important step is to extend its influence over the entire pre-school period. The need reveals itself in the commonplace wastes of child health and ability. Schwarz (1910) rating 670 mothers as to their knowledge of infant hygiene, ranked seventy-three per cent as unsatisfactory. The New York A. I. C. P. (1906) found sixty-five in 108 mothers never heard of the curative value of fresh air, seventy-nine, how to feed babies, ninety-five, proper child-clothing. The Children's Bureau at Johnstown found a mortality of 148 per 1000 births among the infants of 445 literate mothers, but a suggestive increase to 214 deaths among the infants of 246 illiterates. These are random suggestions of the large amount of public teaching necessary before control of the pre-school period can be carried out in practice.

Such teaching commences with organized publicity methods and culminates in the public school. Publicity implies as many different means in as many different channels as possible, but concentrated on certain important points, at appropriate times. Personal demonstration and visitation through trained nurses and physicians are simply the most valuable among many methods. A first essential is to educate editors and publishers. The potential services of the newspaper are commonly undervalued, but at least nine state health departments have a weekly press service of non-technical articles. New York's news bureau adds health hints mailed ready to place in forms. The North Carolina service, for instance, has Save the Baby articles; the Kansas division of child hygiene, a weekly press letter, while general articles reach

about 500 newspapers; the Illinois bi-weekly health stories find practically every paper in the state. Among university extension departments, Wisconsin prints in 330 papers, and Texas employs a trained newspaper writer. Various important national journals now include as valuable from an advertising standpoint, baby-saving campaigns or columns of advice to mothers. Thus the Woman's Home Companion has developed a "Better Babies" service, or the Ladies Home Journal and Delineator publish expert columns.

Literally tons of educational leaflets have been distributed and are readily controlled. Goodwin found at least 400 infant-welfare centers presenting literature to mothers. Even the organization reports may eliminate useless material, break up their headlines, and become educational. A related device is the reporting of health surveys. Typical pamphlets are the North Carolina bulletin, *The Baby*, the New York State division's *How to Save the Babies*, or the recent publication by the federal Children's Bureau, *Infant Care*. Goodwin lists twenty-six state departments of health distributing such literature. Twenty have systematized this educational device in a monthly bulletin service on general health; fifteen issue quarterly bulletins. Michigan issues a special number on infant welfare, with cartoons; and five states add special child hygiene numbers. Among University extensions, the Oregon Agricultural College utilizes the Grange to place articles with mothers; Wisconsin has bulletins on infant feeding or hygiene; and the University of Texas, thirty health bulletins. Among large-scale private agencies, the Metropolitan Life issues related pamphlets. In order to reach foreign mothers, both state and city departments have printed polyglot leaflets. An informational circular should reach all mothers officially registering births; the Washington (D. C.) health department, for instance, co-operates with the public library in sending such literature. A more personal touch may be added by circular letters at registration, as by Indiana or Louisiana; North Carolina has sent letters signed by the governor. A business-like circular letter may be supplemented by the telephone.

Distribution of literature is an effective adjunct of the public address and entertainment. Health departments of thirty-two states, according to Goodwin, report lecturers supplied for talks including infant hygiene; Wisconsin, five deputy health officers; Indiana, a lecture staff of four; and New York's division of publicity and education, three lecturers. In Mississippi, county health officers lecture in the schools on infant welfare. Important lecture systems have appeared in extension divisions. Of sixty-three state univer-

sities, Goodwin found twenty-four with educational lectures. Ohio State University (Columbus) develops infant welfare in connection with one-week movable schools; Texas' division of home welfare gives infant-welfare talks at county fairs, or in connection with a one-week school, county rally, or home-improvement car; the University of Wisconsin, in community institutes. This extension is frequently associated with the home economics departments of agricultural colleges.

Visual presentation in motion pictures is rapidly becoming an important educational aid, since it popularizes the message in concrete form. At least fourteen state health departments use educational films on infant hygiene. Thus Illinois presents Tommy's Birth Certificate; New York, the Care of Babies and Improvement of the Milk Supply; Indiana has six films. The University extensions of Kansas, Texas and Wisconsin also show moving pictures. The Chicago board of health (1911) presented educational films at weekly mothers' conferences, one film illustrating in detail the work of the department nurse. The department has since developed a series of motion-picture dramas.¹² A typical film, *The Fight for Babies' Lives*, was shown in twenty Cleveland theaters, the expense being levied on its members by the Motion Picture Exhibitor's League. Slides may supplement the films. These have been developed by the United States Public Health Service, and by twenty-eight state health departments; Indiana for instance, has 800, Ohio 1500. Stereopticon slides are also furnished by the Universities of Kansas, Texas, or Wisconsin (with 1000). In Baltimore, cut-out health slides are shown in the picture theatres.¹³

Modern educational exhibits combine films, slides, photographs, wall panels, mechanical and still models, or other devices. The health exhibit of the children's bureau at San Francisco utilized colored transparencies and electric contrivances, colored relief maps, screens with new color-schemes, and living exhibits. Pennsylvania illustrates a remarkable series of baby-saving shows, the state department aiding local communities. Exhibits of the parent Philadelphia Baby-Saving Show (1912) included panels and models, demonstration of baby care, and outlines of the work of children's agencies. To newspaper space and street banners, educational motion pictures and popular lectures, was added a two-day conference on infant mortality. One of their best baby-saving shows was held in Erie (1915). Twenty-five states, according to Goodwin, have these special educative devices. The traveling exhibits of some ten departments devote special sections;

¹² Cf. dramatic plays, as the *Theft of Thistledown* (Pittsburgh).

¹³ Cf. posters (electric signs, billboards, window cards, streamers).

Illinois' infant-welfare sections, for instance, are booked for months in advance; Iowa's child hygiene exhibit shows at state and county fairs. New York has three traveling units, with twenty panels and a model infant consultation, each under a manager, trained nurse and mechanician. At least six states have general health cars. Thus infant hygiene is a special feature of the Texas public health car, and Louisiana's educational train devotes more than one-sixth its space. Traveling exhibits are also a product of six important University extensions. Such exhibits are admirably adapted to village and rural communities. For cities, the publicity methods of the New York Child Welfare Committee (1911), with its local surveys and organization of exhibits, are significant. Within three years this remarkable child-welfare exhibit has broadened into important exhibits in fifteen cities. The National Child Welfare Exhibition Committee plans to exhibit constructive state programs; and the Russell Sage Foundation includes a department of surveys and exhibits.¹⁴

Educational efforts in preventive infant welfare may well culminate in Baby Week or similar campaigns pooling different publicity devices. More than 2,083 Baby Week celebrations were definitely reported to the Children's Bureau (1916). This movement formally sets aside a period in which to popularize civic and family responsibility for better babies. It may involve local cooperation with the federal children's bureau and General Federation of Women's Clubs; and tends to become state-wide.

To these educational devices should be added the better babies' contest, a highly specialized development of the infant consultation along publicity lines. Promoted at the Louisiana State Fair (1908) and two years later in Iowa, contests were held at twenty-five state fairs (1913). According to Benton, seventy-one state and about 1,000 county and local better babies' contests have been given (since March, 1914). Important contests include Colorado, Idaho, Mississippi or Oklahoma State Fairs, the Illinois Farmers' Institute (Decatur) or the McLean County Child Welfare Association (Bloomington). The University of Texas not only supervises at the Texas State Fair but organizes contests for county fairs; and five other University extensions actively promote these contents.

The better babies' contest involves a significant blending of the practical and theoretical. Its systematic observation of best specimens should demonstrate what normal infancy is. Its actual scoring of each infant discovers unnecessary defects early in life, when adequate remedies are possible. This element is increasingly realized by extending the entry limit to

¹⁴ Also exhibit material by the Children's Bureau, Amer. Assn. for the Prev. of Inf. Mort. and Red Cross Nursing Service.

five years in order to supervise the entire pre-school period, and by ranking the infant not on actual condition but according to improvement within a fixed period. In Philadelphia, a Child Federation contest judged 600 entries on physical improvement in the baby, plus the sanitary improvement of its home, during four weeks. Pittsburgh's baby week initiated a baby improvement contest with prizes awarded in six months. At the Texas State Fair, the staff of physicians and nurses made thorough examinations of infants ranging from six months to five years, and a prize award to the baby with the highest improvement over its score the previous year.

From the eugenic standpoint, these contests represent an awakening of the parental conscience (*Einstellung*). Through a continuous propaganda for thorough examinations at intervals, they teach parents to see the importance of registering defects with care. The emphasis is properly placed upon the parent in the "better mothers' contests" reaching 540 mothers under Buffalo's health department (1914), or the prize mothers' contest of the Interstate Fair at Trenton (1915). This educational effect should be heightened by additional publicity methods which develop the newly aroused parental interest. Publicity which the awarding of prizes invariably attracts from the press may be accentuated by social features.

The technique requires a thorough examination by responsible physicians, assisted by trained nurses. A preliminary examination and other precautions should be taken against infection; preliminary contests and a special appointment for each mother, should avoid over-crowding and strain. The Texas State Fair, for instance, permits only mothers in the examining rooms; the West Michigan State Fair handles entries in rooms protected by glass from the public. By reducing the "exhibition" of babies to the minimum, the abuse of unsystematic contests is avoided.

The central factor in these contests is obviously the score-card, characterized by G. Stanley Hall as the "crux" of the movement. It should embody a "list of apperception centers from which the people should be encouraged to think, talk, read." Unfortunately in the usual score-card, the tests have been wide of essentials. The card of the Iowa Association, for instance, offered as mental tests six curious generalities, "facial and ocular expression, intelligence, tractability, attention, imitation, disposition," counting for arbitrary points. A score-card of the Better Babies bureau¹⁵ was a real advance, substituting definite psychological tests for different age levels, derived from the Binet-Simon scale. By similar tests of sev-

¹⁵ *The Woman's Home Companion* (New York). Cf. the American Medical Association standard score-card.

eral thousand infants, proper norms for respective mental ages might be developed.

In place of the usual catalog of various anatomical parts, the Better Babies bureau added a physical examination for defects which heavily influences the awards; while a series of definite measurements, though based upon an explanatory wall-chart, count for relatively little in the awards. With norms based on physiological age, the scorer is concerned with imperfections which significantly affect the child's efficiency. Numerous measurements may warrant classification in percentile groups, such as have been worked out by the department of child study in the Chicago schools. To plot them graphically would allow the definite placing of the infant in all possible comparisons with his group. Where definite standards, rather than ratios, are presented, they probably fail to cover even normal racial variations. With advancing data, norms might be roughly classified as at Ellis Island, into perhaps seven racial groups, developing standards for each group and a provisional point scale.

The score-card of the Better Babies bureau offered an interesting infantile history, including food and sleep. Brief data as to crying, fears, or diseases such as syphilis or tuberculosis, might be added. An antecedent personal history for each child would be of eugenic value, if safeguarded to ensure accuracy. It should roughly cover the ancestry and salient family traits, whether of defects, diseases, talents, tastes or peculiarities, physical or mental, of both parents and grandparents. A simplified form derived from the lengthy blanks of the Eugenics Record Office, reinforced by a brief family chart (genealogical), should develop a healthy understanding of the child's inherent possibilities.

The present tendency, however, is probably toward the more moderate conference, rather than contests. As a special flexible outgrowth of infant-welfare centers, the children's health conference developed at the National Conservation Exposition, Knoxville.¹⁶ The conference room was enclosed in glass so that the public might observe, but not intrude. Treatment was not given, nor were the babies scored, but defects were pointed out and advice freely given. By eliminating the contest, it was hoped to attract the "rank and file" of babies, including the mothers of potential "losers." Nearly 1,000 babies were examined. In the exhibit by the children's bureau at the San Francisco Exposition, a model baby clinic was daily held behind glass walls. Circuit conferences with simple exhibits are effective units of public health instruction.

¹⁶ Cf. conferences at Toledo, Atlanta, Peoria; Jacksonville; or the parents' educational bureau (Oregon Congress of Mothers).

So essential is the educational guidance of mothers, it would be surprising had no agencies specialized in organized training. Schools for mothers, schools of domestic arts, and special continuation classes, are important mechanisms in meeting this need. The English Association of Infant Consultations and Schools for Mothers¹⁷ includes 200 centers among the higher and upper-middle working classes. Many have classes for mothers with teachers supplied by local education authorities. The grants of the Board of Education for England and Wales (1916) include \$76,000 for day nurseries and schools for mothers. The St. Pancras (London) School (modeled after the Ghent School) for example, combines with the varied practical activities of an infant consultation, lectures and various classes for mothers, a club to awaken the interest of older girls, and a fathers' department meeting weekly. In the United States, milk-station instruction is effective because the aim is focussed definitely upon an individual baby. Modern methods of learning realized through doing replace mere information (which seldom leads to action). Goodwin lists some 250 infant-welfare stations having such practical classes or clubs for mothers.¹⁸ Settlements may develop classes, as at South End House (Boston) which has a senior babies' club supervising from 1.5 years to the kindergarten age, or at Starr Center (Philadelphia). Day nurseries form such classes as they assume settlement activities. To the Mary Crane Day Nursery (Chicago) are referred ignorant mothers needing physical care or assistance. Such mothers are given certain work at the Nursery (for a dollar and care of their children) and are so rotated as to receive a thorough training in domestic work, even utilizing the sewing room to make clothing for themselves and children, and the kindergarten for recreation in games, music or dancing. The Newark Association in its six nurseries or the Delaine Street Nursery (Providence) also illustrate this wider use of the nursery building. As a reverse of this tendency, roughly twenty per cent of over 400 settlements have day nurseries and forty per cent kindergartens.

Classes may become specialized schools for mothers. Caroline Rest, a convalescent home and school at Hartsdale (N. Y.), entertains 1,901 guests (1915). Mothers with infants learn by sharing in the daily practical routine over a period of 2-3 weeks. This school controlled by the New York A. I. C. P.

¹⁷ As a department of the National League for Physical Education and Improvement (Ashby, 1915).

¹⁸ For instance, stations under divisions of child hygiene in New York, Philadelphia, Cleveland, Pittsburgh, Buffalo or Milwaukee.

(whose bureau of relief includes some 3,000 infants in its families), has now received a bequest of approximately 3.5 million dollars. In Detroit nearly a million dollars has been left to found a mothercraft school for older girls. A school of Mothercraft (New York) was initiated by (Miss) Read (1911), later with a local and now a national, auxiliary. This type of school would receive in a private residence, resident students, day classes, and a small group of resident children of varying ages. The pupils learn by actual work as part-time assistants to these children.

Pre-school care, however, is an inseparable phase of a much larger field, so that its most vigorous future, educationally, lies in modern vocational schools and departments of domestic arts. The vocational course affords a framework for including instruction in pre-school care. The Stout Institute (Menominee Wis.), the Garland School (Boston) or Teachers' College (New York) illustrate specialized schools. Home economics courses were offered in thirty-one state universities, 230 summer schools, 160 state normals, and recognized in all agricultural colleges admitting women (1915). As an integral part of the general educational system, public continuation classes for mothers should be incorporated into the schools. A successful Rochester experiment provided a day course of twelve health lessons for women at the East High School; a trained nurse and woman physician taught the care of children and the sick. Parent-teacher associations and clubs for the instruction of mothers should be applied even in consolidated rural schools. University extension courses¹⁹ reach thousands of married women; other extensions distribute outlines on infant care for mothers' circles.²⁰ The University of Wisconsin provides instruction by correspondence in a home economics course including prenatal care, the lying-in period, infant care and growth. Correspondence teaching by the American School of Home Economics (Chicago) has reached perhaps 20,000 persons. By formal conferences, the American Home Economics Association seeks to stimulate progress.

Systematic preparation for parenthood should also include in the public continuation school system, all girls leaving school at fourteen. This is the strategic period for building home interests. Intimate contact with small children in the study of their pre-school management should automatically and

¹⁹ As in the Universities of Wisconsin, Kansas, Missouri or Minnesota.

²⁰ For instance, the Universities of Nebraska, North Carolina, West Virginia, or Texas.

wisely direct adolescent tendencies. In proportion as correct attitudes are developed, the adolescent girl will exercise a proper influence for pre-school control. Cincinnati's system offers the most familiar standard for continuation classes. In Massachusetts, child nurture is recognized by state-aided schools, for girls fourteen to seventeen years in day school, working girls seventeen to twenty-five in evening classes. Snedden suggests specialized part-time schools, with perhaps three to four hours in systematic home projects. These schools should develop well-organized correlation with hospitals, day nurseries or infant-welfare centers. To the practice house²¹ now recognized as essential in school equipment, might be added day nursery activities. The Y. W. C. A. and settlement may contribute continuation classes. Hiram House (Cleveland), for instance, has a model cottage to teach young girls, at school or working, the elements of intelligent home-making.

Continuation classes supplement or substitute for the high school and the two institutions together offer the special mechanism for reaching the largest numbers. Thirty-three states authorize home economics in secondary schools; and 2,440 high schools (21%) report such courses (1914). Pre-vocational experiences in the changing junior high-school period afford a particularly happy opportunity for pre-school guidance. Mangold suggests domestic arts be made compulsory for all girls in the seventh and eighth grades. The New Haven board of education is experimenting with instruction in the care of young children to eighth grade girls by the school nurse. Philadelphia is equipping school house-keeping centers to instruct the seventh and eighth grades in baby care. Los Angeles has four day nurseries in its public schools; and under the Gary system, at Froebel School, a day nursery affords the older girls practical supervised experiences in the care of children. Other important educative devices are the organization of Camp Fire Girls, and school credit for home projects. Returns from 232 representative high schools indicate in 23 per cent some form of home cooperation. Camp Fire members number approximately 64,000 (1914). As emphasized by Gulick, Camp Fire groups study the infant problem, and to become "Fire-Makers" must explain and illustrate the prevention of infant summer mortality; among the tests in elective honors for promotion are other elements of infant care.

Household art or hygiene teaching in the elementary schools

²¹ Such as the model flat, Technical High (Providence), or the 6 model flats of the New York Association of Practical Housekeeping Centers.

may culminate in the Little Mothers' League, an admirable educative device. The leagues are infant-welfare classes for girls of school age, either as integral parts of curricula or after-school activities directed by health departments and private agencies. Little "mothers" of twelve and fourteen years are still responsible for infant care, and are factors in pre-school morbidity. This strain may mould the growing elementary girl into bad physical form. Goldthwait (1914) has shown the effect of carrying burdens such as young infants, and that different types, such as the narrow-backed or broad-backed child, are adapted to different projects. The New York leagues, for instance, require no homework except a record of every aid to baby's welfare. The school child then becomes an important educational factor in the home, and is at the same time building up proper attitudes towards later parenthood. Among foreign populations in particular, it is easier to reach the child than the adult.

The New York leagues developed through the bureau of child hygiene (1908), adding practical demonstrations the second year, including 239 leagues the fifth year and by 1915, enrolling some 25,000 girls. In these leagues, physicians and nurses teach infant-hygiene to girls of grades five to eight. The bureau files the membership, a leader and secretary are elected, and the girls conduct the meetings. Each child is required to carry out all the work, with a final examination; but motivation devices include league badges, prizes for the best attendance or profit, and small plays or pageants. Eleven other cities supply a distinctive badge to class members. Classes meet twice monthly after school, weekly in summer; and each demonstration is preceded by a short talk.²² The instruction is typically by school nurses.

According to Goodwin, such leagues are organized as a municipal activity in forty-four cities, instructing annually 48,475 young girls. The New York leagues utilize settlements and playgrounds; Hartford (Conn.) or Passaic (N. J.) have playground classes. The New York experience has also demonstrated the usefulness of affiliation with infant-welfare sta-

²² The New York State course (1916) includes (1) the growth of the baby; (2) teething; (3) observation of the well baby; (4) observation of the sick baby; (5) fresh air in the home; (6) sleep and quiet; (7) baby's bath; (8) care of the eyes, ears, nose and throat; (9) baby's clothes; (10) the diaper and its care; (11) the baby's bed; (12) feeding a baby (nature's method); (13) milk (where it comes from and where to buy it); (14) care of milk in the home; (15) milk modification and weaning; (16) making barley water, whey, etc., and diet from 1 to 6 years; (17) prepared foods (uses, abuses); (18) prevention of common diseases; (19) training and education; (20) flies and other vermin.

tions. In the milk stations of Pittsburgh school nurses conduct twenty little mothers' clubs, with examination, badge or present; the Syracuse Infant Welfare Association has such leagues in each of its stations; also Poughkeepsie (N. Y.) and Orange (N. J.).²³ Washington has model flats for instructing little mothers. In at least fourteen cities²⁴ classes are held in the schools during school hours. Rochester, for instance, conducts little mothers' leagues at thirteen child-welfare stations in public or parochial schools, with a total of 114 classes. At least twelve cities now conduct classes in the schools but in after-school hours. Within three years the Philadelphia Child Federation developed two model leagues, twenty leagues were held at public schools, and child hygiene became compulsory for seventh and eighth grade girls in schools with housekeeping centers. In the Oranges (N. J.) classes are held at the Central School, the South Orange grammar school and an East Orange grammar school. Even municipalities of less than 10,000, as Hibbing (Minn.) or Wappingers Falls (N. Y.), have organized classes. Scattered through twenty-three states, a total of seventy-five private organizations report similar health leagues for school girls.

MENTAL HEALTH

This educational control of pre-school health cannot restrict itself to physical welfare but must stress the mental health of the pre-school child. The initial development of the child's tendencies and the habits formed upon them, is the most important reason for extending this educational influence. Rousseau recognized the rôle of "primitive dispositions" in early home education. Pestalozzi and Froebel sought their control in practice.²⁵ Montessori would also allow freedom for a vigorous expansion of early natural tendencies. Adler directs attention to the surprising multiplicity of these personal *Anlagen*, and regards the child as the sum of dispositions influenced by the environment. The Freudian school attach almost startling significance to such instinctive trends in early childhood; along their fictive conductance lines the Freudian wish functions. Without hesitation Watson identifies the Freudian wish with reaction tendencies.

²³ Cf. the supplementary Junior Mothers' Corps at the Cleveland dispensaries, for girls not reached by the public school classes.

²⁴ Chicago, Cleveland, Buffalo, Cincinnati, Los Angeles, Providence, Rochester, Reading (Pa.), Springfield (Mass.), Schenectady (N. Y.), Passaic (N. J.), Northampton (Mass.), Dunkirk (N. Y.), La Salle (Ill.).

²⁵ Cf. Monroe, P.: *Cyclopedia of Education*. Article on Infant Education, Vol. III, pp. 446-52, 1912, Macmillan.

These instinctive tendencies are familiarly illustrated in sexual and aggressive impulses. The young child's sexual impulses, to the Freudians, are very complex and mutable, entirely disconnected from the function of reproduction which they later serve. Freud prefers to regard the *Aggressionstrieb* as a necessary element of all instincts. Freudians have urged that the activists were at bottom sadistic and passivists masochistic, but President Hall believes these two distincts never quite coincide with those of sex. He suggests that all infants range upon an aggressive-passive scale. Aggressive tendencies appear in the child's efforts to modify his environment.

Postnatal environments may in turn control defects existent at birth through processes of compensation.²⁶ By stimulating heightened growth in structure or increased functioning, and involving other structures or activities, the defect is more or less covered. The "errors" of childhood, such as a difficulty in learning to speak, illustrate these functional readjustments. Such compensation restores the balance of the organism. The child's development should be corrected soon after birth; in spite of early compensation, residues of inherited defects may remain through life.

The pre-school period affords the minimum of inhibition and maximum facilitation for the essential physiological habits. Schools, day nurseries, infant-welfare centers and parents, should insist upon fixing habits of healthful activity in eating, drinking, evacuation, bathing or sleeping. Desirable habits involve cleanliness, responsiveness to proper incentives, alternate rest and work. The home environment should progressively cause the success of useful random reactions; Fiske, Preyer or Shinn have called attention to the remarkable number of these adjustments. As G. Stanley Hall suggests, the Freudians have paid little attention to many of these normal traits of childhood, such as sitting, grasping, creeping, walking, crying, correct use of language, sensory development and motor control in general. The nervous system is poorly protected in the earlier years, and intense, rapidly shifting stimulation or premature development should be regarded with suspicion. In these first three years, mind and body are more vulnerable and growth more rapid than in any other period of similar length.²⁷

Since play activities supply the most hygienic means for

²⁶ Cf. Tanner, A. E.: Adler's *Theory of Minderwertigkeit*. *Ped. Sem.*, Vol. 22, 1915, pp. 204-17.

²⁷ Cf. Hall, G. S.: *Recent Progress in Child Study*. *Child Welfare Magazine*, Vol. 8, 1914, pp. 212-16.

laying these foundations of the child's mental life, the school should no more ignore the playground of the young child than of the school child. Parents should be instructed in methods of play by the various educational agencies. The child should enjoy a room for suitable play in winter or wet weather, and an open space for playing, eating or sleeping. The most suitable playground for the small child is the backyard, perhaps with a sand-pile or garden;²⁸ cities should therefore organize the space back of homes as part of a comprehensive system of playgrounds. According to Comey (1916) in suburban sections it may prove practical to save fifteen to twenty-five per cent the total block area, in congested districts, three to four per cent. Comey has shown with ninety-six blocks to the square mile (streets running one-sixteenth of a mile apart in one direction, one-sixth in the other), a playground of 1.6 acres could be left in each block and the lots still have eighty feet depth; even in small blocks, 120 to the square mile, an interior playground of one acre would leave seventy feet in depth. Block-playgrounds should be supplemented by summer outings at farms or sea-side resorts. Children of the New York associated nurseries, for instance, may enjoy two weeks outings, and day excursions or park picnics are frequent. The fresh-air outing extends beyond day nursery and settlement influence, to include an important new series of agencies. Thus the Bay Court Recreation Home (Detroit) entertains for two weeks 500 mothers and children.

As a child-caring agency for the pre-school period the day nursery is not yet fully developed. The nursery equipment should furnish a natural educative environment, to develop the activity side of child life, and indirectly reflect at home the healthy surroundings and active care of the nursery. With child care the means to educational ends, the smaller nurseries might become houses of childhood, much as those developed by Montessori in Italy. The spontaneous participation of the child in nursery life implies trained interpreters. Nurses may comprehend physical needs but not the formation of personal habits. Read (1910) in a suggestive study of fifty day nurseries, found less than half the caretakers, infants' nurses or matrons trained in the mental or physical care of children. At the Mary Crane Day Nursery (Chicago), children develop skill and attitudes of helpfulness by aiding in the life of the nursery, as bathing, combing, dressing, sewing, or cooking and

²⁸ For example, under the Octavia Hill Association (Philadelphia), modern dwellings in Kensington for 48 workingmen's families, provide not only individual yards but playground space in the center of the block.

serving at proper intervals or at small parties. Nearly all the associated Chicago nurseries now have some playground, yard or roofgarden; the New York nurseries are branching out with open-air meals, roof or yard exercises, and small gardens.²⁹ The outdoor activities for children of four to five years at the University of California Play School, are here suggestive. The morning kindergarten circle may involve games, songs, occupations and daily doings in imitation of processes in the home.³⁰ The kindergarten where home and school so intimately meet, exerts an important influence upon the nursery. The strength of the kindergarten influence is roughly suggested by its extent; more than a thousand cities report to the commissioner of education (1914-15), 9,650 kindergartens (eighty-five per cent public) enrolling 486,842 children; with a membership of 19,000 in the International Kindergarten Union. The model nursery includes kindergarten instruction for its older children. Five Atlanta nurseries each have an excellent kindergarten. The Cleveland Day Nursery and Free Kindergarten Association (1915) includes nine kindergartens and five nurseries under common control. Children may be sent to the public schools for kindergarten and other lessons, as in New Bedford nurseries; or the kindergarten, as at the Fitch Creche (Buffalo), be transferred to the public school system. The experimental Montessori schools admit children at two, the *écoles maternelles* of France at two, and the infant schools of England at three years. Gorst suggests that these three-year English infant schools be abolished and nurseries substituted. No school system therefore should ignore the day nursery.

In the nursery or home, as expressed by Thorndike, we redirect and add to original tendencies by arranging the situations so that new and better associations are formed. This associative shifting is identical with the formation of conditioned reflexes as described in the experiments of Krasnogorski, Mateer, or Watson. To control these tendencies adequately during the formation of habits or associations upon them, involves such mental mechanisms as transfer and sublimation, together with repression, operations readily understood by an intelligent parent. The tendency may be reversed into its opposite (*Verkehrung*); or transferred and linked up with other complexes, in a different modality for example, (*Verschiebung*). Certain experiences in the pre-school period may act as over-determinants, reinforcing the tendency and

²⁹ The growing importance of baby day camps as well as open air schools suggests a similar fresh-air development for day nurseries.

³⁰ The kitchen garden, for instance, is a program of songs, games and other activities to instruct in household processes.

causing over-compensation. This transfer of activities developing from the child's *Anlagen* along proper conductive lines (*Leitlinien*) should involve their refinement and specialization, or sublimation. Upon the capacity of the nearest lying factor (such as a sexual impulse) to exchange places with social values, Freud bases the possibility of a higher culture. When the child strives for something, the end finally attained is thus considerably modified. By these mechanisms, inherited tendencies reach educational ends otherwise impossible.

The environment, specially in urban civilization, thwarts many instinctive tendencies. One group of habits may inhibit other groups. Thus the inherited tendency (*Trieb*) may be inhibited by either the *milieu* or by other activities. This mechanism of repression (*Verdrängung*) thus tends to inhibit the development of the psychic structure, especially useless developments. "The spontaneous and uncensored wishes of children gradually disappear as the children take on the speech conventions of the adult." Since repression acts as a check, Jung stresses its tendency to inhibit adaptation. Pfister differentiates a "retention" type which sees the future in the mould of the past, and a "repulsion" type which would press the present into the past. Repressed childish wishes may never completely lose their impulsive power. Even slight abnormality may trace directly back to the infantile experiences of these first years. According to G. Stanley Hall, every form of Janet's 'flight from reality' or of Breuer's autism, even a waking day dream, is a retreat toward the state of infancy. "Every lapse from severe apperceptive logical thinking to the spontaneous lapse of association, every modulation of thought from the abstract toward the *anschaulich*, is a movement childward."

These manifold compensations through their inter-foldings (*Verschränkungen*) and reciprocal inhibitions develop the psychic superstructure of the mind or connection-system. By progressive stages, activities reduce to higher levels of mechanization, or as Messer points out, run their course in abbreviated and telescoped forms. There is an attitude (associative complex) for every situation in every-day life. Combinations of feelings and motor adjustments, constituting the adjustment (Müller-Freienfels) of the child toward the situation, determine what parts of the situation shall be selected. Parental instructions or other influences functioning as *Aufgaben*, influence the child's adjustment by setting up a dynamic factor as the determining tendency controlling the child's response. Important elements in the child's environment thus become standards (*Aufgaben*) towards which his growth may pro-

ceed. As the infant *milieu* is largely the family, so-called family complexes follow the family modes. A familiar illustration of these early attitudes is the father-ideal or the mother-ideal developed by the young girl or boy. As early as the third year, suggests G. Stanley Hall, the parent is beginning to shape the pattern or ideal of the child towards the other sex. Too prolonged intimacy may thus tend to limit the child's powers of adjustment to different personalities. In young children more complexes are common to the mother. Vanishing traces of the typical Oedipus complex, for example, are evident in the boy who wishes his father away or resents his control. Freud cites a 5-year-old boy, *Angst* resulting from repression of an active impulse of hostility to the father and sadistic tenderness to the mother. Adler would explain this complex as a desire for tenderness, and as manly protest by which the child seeks to take his father's place. He instances the wish of Jung's 4-year-old girl to be an adult. Such learning proceeds rapidly before children go to school, because the attitudes or interests formed are the reactions of intrinsic tendencies upon the home environment, and are charged with sufficient feeling to motivate all behavior. These "forgotten years of infancy" thus mould disposition and predispose to later success in family or vocation. The public school simply carries to higher organization the adjustments of the pre-school period.

BOOK REVIEW

Vocational training for children. By V. N. and S. T. SHATSKY.
Bodraya Zhesen. Active Life. Vol. I. Published by The Gram-
otey Co., Moscow, Russia, 1915. 183 p.

This book is a detailed report of the management and organization of a children's colony founded by Madame M. K. Morosova in the province of Kaluya in 1911. The purpose of the founder and her associates was to bring the city children in closer contact with nature and put them under conditions which would enable them to develop their physical and mental powers equally and gradually, without becoming prematurely old as they do in the city.

The book is divided into three parts: the first deals with the activities of the colony during the first summer of its establishment. The authors describe in great detail the daily life of the children in the colony, their work and social activities; preparation of food; house cleaning; garden work; road building; self government; and their discussions of problems, both practical and social. The authors also treat of the influence such work and discussions had upon the children; they point out that, living under such conditions, the children developed better, both physically and mentally, than they do under city conditions.

In the second part the authors speak of the children's return to Moscow for the winter and the keen interest they show in looking forward to their return to the colony in the spring. During their stay in Moscow, they keep in touch with each other and discuss plans for the next summer. On returning to the colony, the children continued their previous work and made some additions, such as beginning to do their own washing, baking, etc.

One of the most important events in the colony was starting a weekly journal, "Our Life." It was edited and managed by the children themselves. The authors give some extracts from articles published in that journal. They all reflect the life of the colony with its happy and gloomy sides and discuss its vital problems. The following articles and stories published will show how the journal mirrored the colony life: "Our Housekeeping," "Our Meetings," "A Sudden Attack on a Hare," "Rights and Liberty," "Sports and Games," "Theatre and Music," etc. Summing up the results obtained in the second summer, the writers point out that during the second season in the colony the children began to realize the fact that work can only be most productive when personal relations among the members became friendly and natural.

In the third part the authors tell how the children lived in the city during the second winter. They organized a dramatic club, and gave a play; studied music; and met to discuss problems concerning the colony. In selecting new members for the colony, the instructors prefer to take young children, as they are likely to remain longer under its influence, while the older ones are in most cases obliged to leave as soon as they are old enough to help in the support of their parents. The third summer the children were divided into two groups; one consisting of the smaller children does light work, and another of boys from twelve to fifteen years of age, does the most important and responsible tasks, giving life and animation to the whole colony. The authors also call attention to the fact that during the third sum-

mer the children took a great interest in music. They point out that musical taste is very near to the child's feelings, and that through music one may easily find a path to its soul.

Summing up the results of the work in the colony, the authors state that the work cannot yet be considered finished, for like any system of education it looks not for forms but for content of work. The only guide the instructors had were the instincts, experiences, sympathies and feelings of the children. The work was hard, but in the three years they have built up an organization and decided upon a policy for the colony. They rely upon music, dancing, play, and free discussion of common problems as they arise. There is plenty of work, intelligently directed and of a character to develop and stimulate the capacities and talents of the future citizen.

The book is well illustrated with pictures of the children at work and play.

Clark University.

S. ZELDIN.

BOOK NOTES

The high school; a study of origins and tendencies. By FRANK WEBSTER SMITH. New York, Sturgis and Walton, 1916. 458 p.

This is a contribution of unusual merit to a topic already very hard-worked, and the author has rather wisely based a good deal of his data upon the general psychology of adolescence. He begins by studying secondary education in primitive times, going back to Homer and Hesiod and coming down to Plato, Quintilian, Jesus, the early Christian centuries, the university period, then the new secondary school, the renaissance, the development in the eighteenth and nineteenth century in the United States, a review of evolution from different standpoints, the twentieth century, programs of study and curricula, principles and methods, organization, equipment and administration. The author gives us a graphic survey. It is a work of originality and independence, and gives us for the first time a genetic approach and point of view. It is impossible in the limits at our disposal to do justice to a work which should mark an epoch in the discussion of the subject.

The science and art of salesmanship. By SIMON ROBERT HOOVER. New York, Macmillan Co., 1916. 193 p.

Everyone has something to sell, and ability to market his commodity or services often determines the measure of his success. In preparing his book, the author tells us his objects have been as follows: to discuss the topic for those who are beginning as well as for those who have had some experience; to help young people test themselves as to what kind of selling they are most likely to succeed in; to give illustrations from various fields and to present material in good English; to diminish the time the department stores have to give to training graduates of secondary schools for their work; and to suggest to people of all classes, whether their contribution to science be in the form of a commodity or service, the principles which will enable them to secure the most favorable hearing. The chief chapter headings are as follows: What is salesmanship? the salesman; the salesman's preparation; the customer; the process of the sale; the demonstration; closing the sale; finding and correcting mistakes; relations between department managers and salesmen; suggestions from a selling letter; department store instructions; the salesman's rewards.

The general value of visual sense training in children. By CHANG PING WANG. Baltimore, Warwick and York, 1916. 85 p.

There are two types of disciplinists, the old who think that mental powers developed by the training of one function will benefit equally all others, so that any kind of study will prepare for life if it is well done; and the type that thinks specific training should be for a specific function, although other qualities applicable in other fields are also developed. The latter hold that there should be different lines of study for the development of different faculties, such as arithmetic, accuracy; Latin, analysis; sense studies, observation, etc. Although the former type of educator is declining and the latter holds the field, Mr. Wang believes that a new survey in view of new light and especially new experimental methods will lead us to certain sure results.

The study of the behavior of an individual child. By JOHN T. McMANIS. Baltimore, Warwick and York, 1916. 54 p.

This is a syllabus for a child-study class on the theory that it is better to study individual cases than the child as a type or children in general. Hence after treating method, etc., the physical condition of the child is considered under ten different headings, with a bibliography. In subsequent sections, home conditions, plays and games, instinctive activities, outside interests and acts, school life, men of character and disposition, learning process, language, drawing, movements and motor activity, moral traits, the exceptional child, are treated in the same way.

The belief in God and immortality; a psychological, anthropological and statistical study. By JAMES H. LEUBA. Boston, Sherman, French & Co., 1916. 340 p.

The author has taken a comprehensive census of people of all grades of intelligence, from college on to the double-starred men in Cattell's "Men of Science," as to their belief in God and in immortality, and he finds a steady decline as he comes up the grades in both beliefs. This was a bold undertaking, and the author faces it in a courageous way. So carefully guarded was the author's method that the results which he used must give us pause. The author, although an ardent religionist, is not appalled or dismayed, but believes that the psychokinetic equivalents of these beliefs will forever stand. The current orthodox interpretation of the instincts that have through the ages made these two great affirmations may be deciduous, but it is now a duty to give these instincts a more adequate interpretation.

Nichiren, the Buddhist prophet. By MASAHARU ANESAKI. Cambridge, Harvard University Press, 1916. 160 p.

Attention has lately been drawn to original religious experiences emphasizing the psychological point of view and disregarding dogma, and here the study of strong personalities has a place. Nichiren, we are told, was the chief prophet of Japan, a unique figure in the history of Buddhism, born in 1222. This work gives his own history, his studies, conversion, public appearance, persecution, narrow escape, sentence of death, his rescue, and finally an exposition of his doctrines and his death.

The mentality of the criminal woman. By JEAN WEIDENSALL. Baltimore, Warwick and York, 1916. 332 p.

This interesting monograph represents the results of an extensive investigation in which the responses of a group of women at the Bedford Hills Reformatory in New York are compared, step by step, with responses to the same mental tests gathered by Dr. Woolley and Mrs. Fischer of the Bureau of Vocational Guidance at Cincinnati. It certainly does bring out in rather a striking way the differences, though not without some similarities, between criminal and normal women.

The ultimate belief. By A. CLUTTON-BROCK. New York, E. P. Dutton (c. 1916). 132 p.

This little book was meant for teachers and states certain beliefs about the nature of man and the universe which children should be taught so that their minds may be protected against sophistries, old and new, although as the work proceeded the author found he was

largely clearing up his own mind. The chapters set forth the need of a philosophy for all, the theory of the spirit, mental, intellectual and aesthetic activity.

The rhythm of prose; an experimental investigation of individual difference in the sense of rhythm. By WILLIAM MORRISON PATTERSON. New York, Columbia University Press, 1916. 193 p.

This work attempts to define what is prose and what is verse. The chapters, after the introduction, are 1. The new standard; 2. Historical survey; 3. The sense of swing; 4. Rhythmic tunes; 5. Vers libre; and finally, general conclusions, with appendices on description of apparatus, experimental procedure and data. It is in some sense a defense against the charge that compared with the music sense of savages we have lost the sense of rhythm.

A history of English literature for students. By ROBERT HUNTINGTON FLETCHER. Boston, Richard G. Badger (c. 1916). 387 p.

This is a general manual designed for students in universities and colleges and others beyond the high school age. The history of literature is outlined with regard to national life, and also to give an appreciative interpretation of the work of the most notable authors. The writer is a teacher of long experience and his book was evolved because he did not find what he wanted in the current literature upon the subject.

Additional publications of the Survey Committee of the Cleveland Foundation, Cleveland, Ohio:

Wage earning and education. By R. R. LUTZ. 1916. 208 p.

School organization and administration. By LEONARD P. AYRES. 1916. 135 p.

The garment trades. By EDNA BRYNER. 1916. 153 p.

Household arts and school lunches. By ALICE C. BOUGHTON. 1916. 170 p.

Dressmaking and millinery. By EDNA BRYNER. 1916. 133 p.

The public library and the public schools. By LEONARD P. AYRES and ADELE MCKINNIE. 1916. 93 p.

The Cleveland survey (summary volume). By LEONARD P. AYRES. 1917. 363 p.

These volumes of the Survey, like those that have preceded, distinctly enhance the impression of both the elaborateness and the advanced status of educational work in Cleveland, which from some points of view is the banner city of education in this country. The only remark to be made is that some of these departmental publications come so long after the survey was made that in some of the newest fields work elsewhere has gone ahead of what is reported here, as indeed very likely it may have done to-day in Cleveland itself.

The psychology of drawing; with special reference to laboratory teaching. By FRED CARLETON AYER. Baltimore, Warwick and York, 1916. 186 p.

This work is a study of drawing as a device in laboratory teaching, and includes a survey of existing literature upon the subject, a characterization of the chief contributions to it, etc. After defining the scope of the problem, the author proceeds to the literature, and third, to experiments and conclusions.

The experimental determination of mental discipline in school studies. By HAROLD ORDWAY RUGG. Baltimore, Warwick and York, 1916. 132 p.

The point of this book is that it presents in compact, tabular form a summary of all the experimental work done upon formal discipline to date, and gives the results of the author's own investigation, conspicuous because it deals with so many subjects (Illinois students), and because it measures the effect upon mental efficiency produced by a course of instruction under ordinary conditions.

The doctrine of formal discipline in the light of experimental investigation. By NELLIE P. HEWINS. Baltimore, Warwick and York, 1916. 120 p.

One chief problem of educational psychology is the mental endowment and original nature of man, the nature of the learning process and the nature of training. This work is largely devoted to the latter. The work in this book is not unlike that presented in the volume by Dr. Rugg above.

Community center activities. By CLARENCE ARTHUR PERRY. New York, Russell Sage Foundation (c. 1916). 127 p.

This little work treats the following topics: Civic occasions; educational occasions; entertainments; handicrafts; mental contests; neighborhood service; physical activities; social occasions; club and society meetings; voluntary classes; sample programs; publishers' names and addresses.

An introduction to experimental psychology in relation to education. By C. W. VALENTINE. Baltimore, Warwick and York, 1916. 194 p.

This book gives an account of a number of psychological experiments that bear directly upon education and the teacher's work. They are experiments that can be carried out without much apparatus, and as of all text-books it is said to meet a long-felt and strong need. It is divided into two parts, first the experiments themselves, and second, the results and applications to school children.

Mary Astell. By FLORENCE M. SMITH. New York, Columbia University Press, 1916. 193 p.

This study formulates the seventeenth and eighteenth century ideas on the education of women as presented to that period. The work opens with a biography, and then treats the subject's educational writings, pamphlets on marriage, her religious tracts, political pamphlets, and finally her character and influence, with a bibliography.

Vocational secondary education. Prepared by the Committee on Vocational Education of the National Education Association. Washington Govt. Printing Office, 1916. 163 p. (Bureau of Education, Bulletin, 1916, No. 21.)

This gives first a general historic sketch, then describes types of secondary schools, descriptive analysis and illustrative examples, some ways in which it may introduce its organization, method of gathering data, difference between vocational education and guidance, proper methods of financing, general problems of vocational education.

A point scale for measuring mental ability. By ROBERT M. YERKES, JAMES W. BRIDGES, and ROSE S. HARDWICK. Baltimore, Warwick and York, 1915. 218 p.

This book is divided into five parts, with the following captions: The constitution and relations of the point scale; results of the application of the scale to normal individuals; results of the application of the scale to defective or deranged individuals; revision of the scale; the outlook.

Principles and methods of teaching. By JAMES WELTON. 2d edition. Baltimore, Warwick and York, n. d. 677 p.

This is a second edition, not much changed from the first, of a ponderous, solid, sound but not strikingly original treatment of education in general, and of each of the chief school topics in particular.

Educational survey of Wyoming. By A. C. MONAHAN and KATHERINE M. COOK. Washington, Govt. Printing Office, 1917. 120 p. (Bureau of Education, Bulletin, 1916, No. 29.)

This excellent survey, made under the direction of the Bureau of Education, begins naturally with a sketch of the history and then the present condition of education in the state, with various illustrations, especially of good and bad schoolhouses. The third section is devoted to school revenues; the fourth, to movements in other states as outlined in the recommendations for Wyoming. Finally come the recommendations. On the whole it is a succinct and excellent study.

Report of an inquiry into the administration and support of the Colorado school system. Made under the direction of the United States Commissioner of Education. Washington, Govt. Printing Office, 1917. 93 p. (Bureau of Education, Bulletin, 1917, No. 5.)

The Colorado report begins with a general sketch of Colorado and its educational system, and then in successive chapters details recommendations.

Education by life; a discussion of the problem of the school education of younger children. By various writers. Edited by HENRIETTA BROWN SMITH. 2d edition. Baltimore, Warwick and York, 1914. 211 p.

This work is the combined product of a number of minds not entirely coinciding but in general harmony with each other, in regard to what education by life is, means and can do.

Mount Vernon; Washington's home and the nation's shrine. By PAUL WILSTACH. Garden City, Doubleday, Page & Co., 1916. 301 p.

This is an elegant book of twenty-one chapters with some scores of illustrations, is of historic interest and admirably adapted for a Christmas gift.

Iwaya's fairy tales of Old Japan:—Momotaro, the story of peach-boy, tr. by HANNAH RIDDELL; *Tamanoi, the jewel spring,* tr. by FANNY B. GREENE, and other tales. Tokoyo, Bun Yo Do To Mi Ta, 1914.

This is a collection of fairy tales from Japan, printed in large type, copiously illustrated, and elegantly bound.

Educational directory, 1916-17. Washington, Govt. Printing Office, 1917. 197 p. (Bureau of Education, Bulletin, 1916, No. 43.)

The dance and life. By S. MILDRED STRAUSS. New York, 1916. 22 p.

The Granta Shakespeare. Edited by J. H. LOBBAN. Much Ado About Nothing, and The Tempest. Cambridge, University Press, 1916. 2 v.

Proceedings of the tenth annual meeting of the Association of Life Insurance Presidents. New York, December 14 and 15, 1916. 194 p.

Mortality Statistics, 1914. Department of Commerce, Bureau of the Census. Fifteenth annual report. Washington, Govt. Printing Office, 1916. 714 p.

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UNIVERSITY REFORM IN GERMANY*

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The teaching force of the German universities may be roughly divided into ordinary, and non-ordinary teachers. The *Ordinary Professors* (O.P.), either with regular professorship, which is fixed and continuous, or with personal professorship, which expires with the occupant, constitute the nucleus of the teaching staff. They are appointed by the reigning Sovereign upon the motion of the ministry who, as a rule, take into consideration the proposals by the faculty of the names of three men thought suitable for the position; but the government is not bound to confine its choice to these names. In addition to a salary paid by the State, graded according to length of service until a maximum is reached, they draw honoraria for their private lectures and fees for graduation, and other examinations. In the administration of the inner affairs of the universities only O.P., generally speaking, have a right to vote as occasion presents itself. From their midst the rector of the university is elected, and from their number also proceeds the delegate of the university chosen as its representative to the Diet of the State.

The *non-ordinary staff* (N.O.) consists chiefly of Honorary Professors, (H.P.), Extra-Ordinary Professors, (E.O.), and Private Docents (P.D.).

H.P. have the rank of E.O., but have neither teaching com-

* This paper presents in substance the first chapter of a study entitled "University Organization and Reform." The other chapters discuss the universities of Austria, Switzerland, Bulgaria, Great Britain and the Overseas Dominions, France, Russia, Italy, Spain, Greece, Sweden, Norway, Denmark, Japan, and the United States.

mission and salary, nor a definite duty as instructors. In most cases they are older men who have made a name for themselves and in this way are publicly brought into independent connection with a university.

E.O. are either "etatsmässig" or "non-etatsmässig," that is to say, with or without a fixed salary. The former are appointed permanently at a fixed salary which is periodically increased until a maximum is reached. They have a teaching commission for a certain subject or a group of subjects, usually to complete the instruction in the chief branches of study or to represent subjects for which as yet no ordinary professorship has been created. Although sometimes in charge of important sub-departments, their position is that of an associate or assistant professor and as such, with few exceptions, they have neither voice nor vote in the administrative affairs of the university or of the faculty. If non-etatsmässig, they draw no salary but sometimes have a teaching commission and, in that case, receive a small remuneration.

P.D. are scholars who, on the fulfilment of the requirements of habilitation, have been extended the privilege of teaching in a university. But the bestowal of the *venia legendi* signifies merely admission into the teaching body of scholars and not into the State's official corps of instructors. Hence his lecture fees are the sole remuneration which a P.D. may expect. Teaching commissions, given only rarely and in exceptional cases, are limited and involve no claim to permanence. As a teacher the P.D. is, nominally at least, on equal terms with the professors. He has the use of lecture rooms and laboratories and his lectures and exercises are officially announced. Formal enrolment of students in his courses is accepted as regular work, but they are confined to the subject for which the P.D. has qualified.

The historical predecessor of the P.D. was the *magister legendus* of the early *universitas*. In the times of the *studium generale*, and also later when that title had been absorbed and *universitas* designated the institution of learning as such, every student, by virtue of his degree, became a member of the faculty by whom it was conferred. The bestowal of the master's degree included the *venia legendi* and in some instances involved the obligation to teach at the mother university for a period of two years. Though self-preservation soon made certain distinctions imperative, in principle this right of the Graduate to lecture everywhere without special permission remained with him for several centuries. The university of Halle, for example, founded in 1694, reiterated in its statutes his right to all the functions of the professor as established by law or by custom. His position, however, never an enviable

one, in time became so precarious that in the first half of the eighteenth century not many followed the calling. An academic career at its best offered then but few attractions. The middle classes were poor, and bright and promising students from these strata of the German people aspired to positions more lucrative than the breadless art of teaching in the universities whose reputation had sunk low and who were completely overshadowed by the newly founded academies.

Probably for similar reasons the number of extra-ordinary professorships was not large at that time. This position had come into vogue during the seventeenth century when various Sovereigns, in addition to regular professors, called to their universities professors "extra ordinem." They received no fixed salary but usually a small emolument from the private exchequer. They were excluded from participating in faculty affairs and had no voice in the autonomous administration of the university. Their position was desirable chiefly because it was apt to be a stepping-stone to an ordinary professorship whenever a vacancy occurred.

GRADUAL INCREASE OF THE N.O.

Available statistics show that in the second half of the eighteenth century the E.O. and P.D. formed a negligible part of the university teaching staff. In 1758 the N.O. constituted 24.8% of the teachers in all German and Austrian universities. For forty years this percentage remained nearly stationary so that in 1796, 26.8%, or a trifle more than one fourth of the force were N.O. But the next century saw a great change in these proportions. The N.O. increased so rapidly as in time to equal and finally greatly to surpass the O.P. in number. The relatively greatest increase occurred after 1880. The ratio in the German universities was in

1880.....	94 N.O. to 100 O.P.
1890.....	121 N.O. to 100 O.P.
1900.....	140 N.O. to 100 O.P.
1906.....	144 N.O. to 100 O.P.
1914.....	167 N.O. to 100 O.P.

Whereas, accordingly, at the beginning of the eighteenth century the ordinary teaching force represented the university in number as well as in fact, at the beginning of the twentieth century the situation is almost reversed, so that in some of the larger universities the E.O. or the P.D. are more numerous than the O.P.

Factors of both an objective and a subjective nature are held to be responsible for these conditions. In the first place,

the number of O.P. was not increased sufficiently to keep step with the increase in the number of students. Then again, an inner need for a larger teaching force made itself felt, in satisfying which the increase in ordinary professorships proved entirely inadequate. It grew out of the enlargement of the subject matter, specialization, and the consequent formation of new and independent sub-departments of various sciences. To create ordinary professorships for all these divisions was obviously inexpedient. But since the teaching of each required the knowledge of a specialist, the number of N.O. grew. In the meantime, subjective factors contributed to the same result. While in the eighteenth century literary pursuits or the diplomatic service were generally given the preference to an academic career, sentiment changed in the nineteenth century and thereby caused the supply of academic teachers to exceed the demand. The lure of academic freedom and independence, the long vacations, the privilege to arrange working hours to suit one's convenience, and the opportunities for research prove enticing to many, not to mention the preferred social status of the academic teacher and the nimbus that surrounds the title of "Professor," which acts on the ambition and vanity of certain classes as a power of irresistible attraction. On the other hand, the overcrowding of all professions, the inevitable long waits for positions, and the immediate need of some sort of an income, drive many to chancing an academic career. Thus, inducements, often diametrically opposed, combine sometimes in creating motives for embarking upon the academic career and thereby produce an oversupply of younger teachers.

An analysis of the social origin of the N.O. sheds further light on the phenomenon. Professor Eulenberg (5), dividing the parental vocations into five larger categories, ascertained in 1908 by means of a questionnaire that the higher commercial pursuits and the learned vocations furnished over two thirds of the academic after-growth, so called. The fathers of over 37% of the N.O. were found to be land-holders, manufacturers, or merchants. They comprise the well to do classes. They have grown rich and their sons can afford a breadless scientific career, a fact, of course, which does not preclude the possibility of their being turned in that direction by a psychological factor, founded in the general spirit of mental activity and agility that is apt to prevail in their homes. In the group comprising professional and related vocations which demand a higher education, the university teachers, as is to be expected, were most numerous. Social heredity, expectation of aid in habilitation and promotion, and of a general smoothing out of affairs, probably account for it. Next came

the physicians where the parental milieu most likely played an equally important rôle. A relatively large number was furnished by the higher State-officials, with whom the opportunity for the son to make a name for himself, and also the social advantages of an academic career might have been the determining factors. The showing made by the small capitalists confirms the conclusion that the learned and the well to do furnish the bulk of the academic aftergrowth, and that the contribution is small when the parental vocation tended to create a mental atmosphere which diverted attention from an academic career.

DISTRIBUTION OF THE N.O.

The non-ordinary force does not form an inner homogeneous unity but is characterized by typical similarities and differences which correspond to general conditions. The Prussian, the non-Prussian and the Austrian institutions form distinct groups; the large, the medium, and the small universities show noteworthy differences; and again, the distribution among the single faculties is not uniform. The relatively large proportion of N.O. in Prussia and in Austria has its cause chiefly in the abnormal conditions which obtain in Berlin and Vienna. The bulk, namely, of the N.O. is found in the larger institutions, whereas the smaller ones are avoided. This is largely due to the fact that larger cities, such as Berlin, Vienna, Munich and Leipsic, present better opportunities for supplementing the income from academic teaching with that from private occupations. Or the opposite sometimes is the cause. A well to do P.D. prefers the comforts and attractions of life in the metropolis. Indeed, it is not an unheard of occurrence that a P.D. in one of the larger universities, with a lucrative field of activity, is loath to be transferred to a smaller institution, even with promotion in sight.

As to the faculties, the academic after-growth in theology and in law is not numerous, and that for obvious reasons. The lack of differentiation within the sciences, the exclusiveness of the single branches, and the dogmatic treatment of the subject matter are not very conducive to stimulating scientific research. Entirely different, however, are conditions in the medical faculty where the ideal of individual instruction is approached. The ratio of N.O. to O.P. in this faculty is more than 3 to 1. Although this large number of N.O. is desirable, it is nevertheless to be pointed out that many of them have but loose connection with the university. In some cases habilitation is obtained by physicians chiefly in the hope of improving thereby their medical practice. Leniency in the

requirements of habilitation is also held to be responsible for the overcrowding. Similar, and for much the same reasons, are conditions in the natural sciences where, particularly in chemistry, the growth in numbers of the N.O. seems to be out of proportion to the requirements. In history and philology, owing to many sub-divisions of the sciences and to specialization in many directions, the number of O.P. is large and the after-growth also is, and may be, large without the supply exceeding the demand, more particularly since for many of the smaller sub-divisions no ordinary chairs have been established.

Looked upon as indicators of the chances for promotion the figures show that for each 3 O.P. in theology and in law there are two prospective successors, whose chances, accordingly, are fairly good. In history, where the numbers are nearly equal, advancement depends on the length of life of the O.P. Least favorable appear the chances for promotion in the medical faculty where there are 3, and in the natural sciences where there are 2 candidates for each prospective vacancy. But fortunately all this is but figuratively speaking true. As a matter of fact, the circle within which the actual selection for advancement occurs is much smaller than the absolute numbers indicate. This is made evident by even a casual analysis of

THE INNER COMPOSITION OF THE N.O. STAFF.

Looked at from within, the N.O., from the view-point of personal position and ambition, may be divided into three general groups. (1) N.O. with whom teaching, either from necessity or from choice, is but a secondary occupation. As a rule they occupy another position from which a fixed income is derived. Such are directors of museums or of statistical bureaux, superintending physicians of state or city hospitals, librarians, clergymen, etc. Their presence in the university is held to be wholly desirable. A permanent contact with non-academic conditions of life is apt to result in the introduction of a new and probably wholesome point of view, since only the better qualified know how to combine in this manner their scientific interests with an improvement of their financial condition. To be sure, there is the disadvantage of their subordination to the external influences of politics, church, and other higher authorities, which robs them in part of that freedom and independence so inseparable from the position of the academic teacher. This fact, however, requires no serious consideration. Advancement to an ordinary professorship is in their case improbable, if not impossible, chiefly because

their necessarily limited academic activity precludes achievement of that distinction of scientific performance which is a condition of promotion. Hence they are hardly to be counted in as academic after-growth. (2) The free lances, or those who for certain reasons, voluntarily or involuntarily, have to renounce all aspirations to an ordinary professorship. Among them are men who for one reason or the other were prevented from obtaining the *venia legendi* until late in life. Perhaps they were teachers or officials elsewhere, thirsting for the greater freedom and more extended sphere of activity at a larger university. Possibly they have only lately been rendered financially independent and thereby enabled to give their whole time to scientific research. Others there are, full of scientific enthusiasm, who are satisfied to make a living somehow, supplementing their lecture fees by an income derived from tutoring or from authorship. All these do not care to be identified with the official organization of the university, including the drudgery of administrative work. Here also belong the so-called "outs" of each science: In theology, the free thinkers of an orthodox faculty; in medicine, the representatives of some special school; in the natural sciences, the neo-vitalists; in philosophy, the followers of Hegel, Schopenhauer, von Hartmann, or Avenarius; in national economics, the disciples of Manchester or of scientific socialism; in a word, all those outside of that realm of science which is officially recognized by way of a teaching commission. All in all, a mixed gathering of scholars this, who indeed contribute much to the life of the German university, giving it color and shading, but who are hardly in line for an ordinary professorship, that official position meant to be entrusted only to those who cultivate the commonly accepted branches of learning to be transmitted to the future officials, physicians, judges, teachers, etc. (3) The last and numerically strongest group, the regular docents; namely, those who mean to ascend the academic hierarchy; first, to be promoted to an extraordinary professorship without or with teaching commission and, eventually, to reach the final goal in the form of a full professorship. They constitute the real academic after-growth and, as will be made more evident, by force of the extensiveness and importance of their activities are an integral part of the teaching staff. Yet, their participation in the inner administrative affairs of the university is insignificant, and again, not an inconsiderable part, it is claimed, is retained in this unofficial position without being less useful or necessary for university instruction as a whole than the ordinary professors are.

THE MOVEMENT FOR REFORM

Rumblings of dissatisfaction and whispers of the need of reform have for sometime been going the rounds of the non-ordinary teaching staffs of many of the universities. But, while convinced that prevailing conditions were the sluggish resultant of tradition, prejudice, and inertia, rather than the live product of clear and far-sighted vision, the majority preferred to remain silent. They adapted themselves to the administrative machinery as they found it, satisfied with the wisdom of the adage that discretion often is the better part of valor. In 1907, however, a few of the more venturesome decided that the time for action was ripe. A call to all universities where the German tongue is spoken was issued by a preparatory committee, and the Fall of that year saw at Salzburg the first German university teachers convention.

Discussion turned to a variety of topics. Since reform, like charity should begin at home, the shortcomings of academic teachers were given an airing. On the other hand, speakers deplored the fact that the well founded system of autonomous administration under State supervision had been permitted to deteriorate into that of a bureaucratic hierarchy. Attempts of government interference in matters which always had been functions of the university were criticised as demoralizing, tending to lower the status of university teachers, and even threatening to render freedom of teaching but a hollow name. Under these conditions, it was pointed out, the problem which confronted them involved not the mere question of a readjustment of a few personal grievances but the attainment of an ideal; hence, further apathy might easily be construed as emanating from the lack of an adequate sense of professional honor. Concerted action was urged and, organization being effected, it was voted to co-operate in the establishment of an annually recurring convention and in the formation of local organizations in all cities where universities are located. Through the efforts of an executive committee a number of local organizations soon came into existence and, in 1909, the E.O. in nearly all Prussian universities had locally combined and under the name of "Association of Prussian E.O." formed an inter-institutional organization. The P.D., being left to shift for themselves, established local organizations of their own, but at a conference in Halle in 1912, to which all other non-ordinary organizations then in existence had been invited, effected a second inter-institutional combine under the name of "Association of German P.D." Finally, in 1912, all local organizations in the non-Prussian universities, where the E.O. and P.D. had made common cause, united

with the German P.D. in a larger body known as "Union of German N.O. Organizations" which, accordingly embraces all German N.O. with the exception of the Prussian E.O. Headquarters are maintained at Halle from where annual reports are issued of which, however, but two have thus far appeared.

THE ARGUMENT OF THE ADVOCATES OF REFORM

Notwithstanding changed conditions, State authorities and faculties, the directive forces of the university, still persist in regarding the position of the E.O. as, what historically to be sure it is, an intermediate or transitional one. This is held to be the comprehensive cause of the unsatisfactory conditions. The rest is but a bill of particulars.

Proof that the position of the E.O. is in reality no longer a waiting station is adduced from various directions. There are many reasons for falling by the wayside en route to the circle of the select. A teacher may represent a discipline for which from financial reasons no full professorship has been created; his branch may be too specialized and remote to admit of the establishment of a chair; or it may be so unique as to render inexpedient its perpetuation owing to the difficulties to be encountered in the attempt to secure a suitable successor. All these are apt to be permanently retained in the position of an E.O. Again, in several branches the after-growth is so numerous that a number of candidates are available for every vacancy and, since outsiders are occasionally extended a call, individual chances for promotion are correspondingly small. External influences, such as matters of creed or adherence to some definite school of thought, sometimes modify, favorably or unfavorably, the degree of eligibility. Lastly, the fact is to be mentioned that advancement to an ordinary professorship comes to the average teacher only relatively late in life.

On the other hand, the work of the E.O., it is asserted, qualitatively as well as quantitatively is equivalent to that of the O.P.; his responsibility, when occupying the position of manager of an institute, seminary, or clinic, often equals that of an O.P.; his importance also is recognized by the State, since E.O. are pressed into service in the State examinations. Yet, in all which concerns rank, salary, corporate rights, and official influence in matters of instruction and administration, the E.O. is dealt with as occupying a minor position, so much so that in some instances he has retained even the official robe of the P.D.

THE GOVERNMENT'S POINT OF VIEW OF THE POSITION OF
THE E.O.

Officially, the N.O. claim, an extra-ordinary professorship is regarded as a subsidiary or provisional position. Its function is to supplement or to complete instruction. It has been thus defined on various occasions in the discussions of the diet and by ministers of education: "Whenever a new discipline springs up, to start with, an extra-ordinary professorship is created, and later, when this discipline has become fixed, when its general importance can no longer be questioned, and particularly when a suitable man for the position has been found, an ordinary professorship is established. Naturally, this step also depends largely on considerations of a financial nature." Hence, when the number of students in a department increases very rapidly and the scientific work grows to such an extent that one teacher can no longer master it, it is the custom of the authorities to place an E.O. with teaching commission alongside the O.P. And similarly, in order to estimate the range and importance of a new branch of science, an E.O. with special teaching commission is at first put in charge.

Consonant, furthermore, it is pointed out, with this official conception of the position of the E.O. are his emoluments. A few data substantiate this. Of 155 Prussian E.O. who in 1909 answered an inquiry,

(a) 30 were outside the official salary provisions, but of these 19 received a remuneration of from \$150 to \$750 annually.

(b) 105 came within the official salary provisions which since 1909 are in Prussia as follows: Initial salary, \$650; after 4 years, \$775; after 8 years, \$900; after 12 years, \$1,000; after 16 years, \$1,100; after 20 years, \$1,200. Professors who derive an income from extra-academic activities remain at the initial salary. Those who draw less than \$300 in collegium fees are paid the difference to make up that amount; on the other hand, there is a deduction of 25% from all fees over \$750, and 50% from all fees amounting to more than \$1,000. An allowance for rent goes to all who are "etatsmässig."

(c) 20, who were division superintendents, received the salary of an E.O. purely in their capacity as State officials. Academically their position was entirely titular, could be terminated at six months' notice, and entitled them to a pension only under the general code.

Significant, finally, in stamping the position of the E.O.

as a subordinate one, are the definitions of his status in the statutes of various universities. Those of the university Bonn, for instance, expressly state that to an extra-ordinary professorship shall be promoted "the more eminent and rising young academic docents, partly in order to encourage them in their chosen profession, partly to have them assist the O.P. and supplement his work." And this conception dominates the constitutions of all universities. The administrative rights of the E.O. are conspicuous by their absence; his participation in matters concerning instruction is limited and, being regulated chiefly by custom, is permissive rather than mandatory.

THE FACTS IN THE CASE

The contention that the N.O. occupy chiefly positions in the newer, more remote, the relatively unimportant branches of science, and that in most cases these are but temporary positions, is disproved by an analysis of (1) the teaching commissions of E.O., (2) the activities of the N.O., (3) the time required for preparation, the waiting periods and the age of the N.O., and (4) the average age of the O.P., which suggests the need of a rejuvenescence of the official teaching force.

TEACHING COMMISSIONS OF THE E.O.

Of 150 Prussian E.O. outside of Berlin, in 1909, 23 E.O., or less than 1/6 had no teaching commission, due to the fact that mere titular promotions are rare.

27 E.O. had a teaching commission designated as "for the purpose of supplementing the activities of the department O.P."

14 E.O., or less than 10%, had a teaching commission for a special discipline, subordinate to the department O.P.

43 E.O. had a teaching commission for a substantial discipline and in many cases were independent of the O.P., the commission being worded "to represent in lectures and exercises" theoretical physics, children's diseases, etc.

43 E.O. had a teaching commission which in no way differed from that of an O.P.

In other words, of the E.O. with teaching commissions more than two thirds had full charge of their department or sub-department. That a goodly number of these teaching commissions were equivalent to those of O.P. is indicated by the fact that certain disciplines of E.O. in smaller universities are in the larger institutions in charge of an O.P., and again that the duties and responsibilities of many of these E.O. do not differ from those of an O.P.

In 1907, for which year full data are available, about the same ratio obtained, approximately two thirds of the E.O. in all German and Austrian universities having larger or smaller teaching commissions. Their general importance for instruction is revealed by a brief review of

THE ACTIVITIES OF THE N.O.

The lecturing activities of the E.O. and P.D. combined amounted during the summer semester of 1907 to over two fifths of the total number of lectures delivered in all the universities. In the natural sciences the N.O. assumed nearly one half of the total lecturing activities, and in medicine the number of weekly hours of the N.O. actually surpassed those of the O.P. Some of the causes of this state of affairs have already been referred to. Foremost responsible is the growth of the subject matter of science, the introduction of new disciplines, and the development of new branches by specialization, to cover which the number of ordinary professorships proved inadequate. A second reason is that the increase in the number of O.P. has not kept step with the growth of the student body. There were in round numbers for each O.P. in 1860, 20 students; 1880, 22 students; 1900, 29 students; 1910, 43 students.

And thirdly, promotions to an ordinary professorship in recent years occurred largely in the philosophical faculties, whereas in the so-called upper three faculties the number of O.P. was in some instances actually reduced. Parallel chairs in the latter are rare and, as a consequence, O.P. often lecture to audiences of 200 students or more.

However, in addition to the lecturing activity, an important development in another direction must be considered, namely, individual and personal instruction. Mass instruction by the lecture method is not everywhere feasible. Particularly in medicine and in the natural sciences great weight is necessarily placed on institute and laboratory work, and this individualized form of instruction is beyond the power of one man. From 10 to 15 may be said to be the maximum number of students whose work one instructor is able to profitably supervise. Assistants are required and lately have been employed in increasing numbers, in part for reasons other than the one just mentioned. The celebrated and much sought after O.P. has more important work than that of instructing beginners and, again, a younger man sometimes is really better qualified to teach those to whom he stands personally closer, and to teach that which requires more recent practice than the older men usually can boast of. Here then a great

field is open to N.O. and we find, as a consequence, in medicine, a small army of E.O. and P.D. occupying positions as assistants, chief-physicians, prosectors, institute-managers, etc., and in the natural sciences, over 30% in positions of similar importance.

From a qualitative point of view likewise it is necessary that the O.P. have assistance. The student body has not only increased in size but of late has become more heterogeneous, being composed of graduates of three kinds of institutions with wholly distinct methods of preparation. Not a few are attending the universities without being immatriculated. Male and female teachers, agricultural students, authors, journalists, and others, many of which would derive little benefit if condemned at once to an attendance of the advanced courses by O.P. and who are better served by first subscribing to introductory lectures and courses offered by assistants. Then again, the generally recognized schools of thought and the officially approved views do not appeal to all, yet the true meaning of the term "universitas literarum" implies the obligation of presenting all sorts of views, while the principle of freedom of teaching involves the right of all needs being satisfied. Here also the N.O. steps into the breach and, by introducing a younger force and a new point of view, becomes a wholesome competitor. Lastly, some entirely new tasks have of late come within the scope of academic activity. Merchants, factory managers, workers of all kinds, and even women, are now admitted to the most advanced courses of vocational education, and courses are offered which aim at a refreshing and bringing up to date of the knowledge of those who are permanently occupied with their life's work. Review courses for physicians, continuation courses in political economy, vacation courses for teachers and theologians, technical courses in the natural sciences, and advanced theoretical courses for superintendents and other officials of the great mercantile and industrial establishments, have in recent years become fixed innovations at some of the universities. All these facts, it is held, combine in permanently raising the utility threshold of the non-ordinary teaching force and, by the extensiveness and variety of their nature, tend to show that the academic after-growth has not only acquired a new and inner import, but has assumed specific and independent tasks which are mentally or physically beyond the range of activity of the ordinary professors.

TIME OF PREPARATION, WAITING PERIODS, AND AGE, OF
THE N.O.

An analysis of the average age of the present N.O. and a comparison of their age at the different preliminary and intermediate stations with the corresponding age of the present O.P. impels the question, it is pointed out, whether the time is not rapidly approaching when an extra-ordinary professorship can really no longer be regarded as a stepping-stone to promotion.

Statistics, applying to 1907, show that the O.P. obtained the Ph.D. degree at an average age of 23.7 years, the N.O. at about 24.5 years; in other words, that the average age of promotion gradually has been pushed forward. Habilitation, the next step in an academic career, was obtained on an average by the O.P. at 28, after 4.2 years of preparation; by the E.O. at the age of 30.7 years, after 5.4 years of preparation; by the P.D. at 30.7 years, after 6.1 years of preparation. These figures indicate that the time of preparation for an academic career is steadily increasing.

The O.P. had attained the grade of E.O. at an average age of 32.4 years, after averaging 4.3 years as P.D.; the E.O. had been promoted to that position at an average age of 36.5 years after averaging as P.D. 6.6 years, or 2 years longer than the O.P. If one considers that the average age of the P.D. in 1907 was over 38 years and that they had occupied this position already for an average period of upward of 6 years, it does not seem unreasonable to assume that in their case the intervening period to promotion will again be considerably prolonged.

The O.P. had reached the full professorship after a waiting period of approximately 4.5 years at an average age of about 37, which means that they had reached the goal at an age when those who were then E.O. had been appointed to the lower office. Since the average age of the E.O. was somewhat over 46, and about 10% of the E.O. were over 60 years of age, and since by a prolongation of the waiting periods at the intermediate stations the prospects of ultimate advancement to a full professorship become more and more remote, it seems indeed necessary to pause and reflect if it is still permissible to speak here of an after-growth.

It is, of course, true that occasionally a young man is appointed to a full professorship, but on the whole, it would appear, the figures above can be trusted to describe the actual conditions. They are confirmed by the following calculation: In 140 promotions to an ordinary professorship during the three years from 1905 to 1908 the average age of the new

appointees in all Prussian universities was 41.7 years, and that of 55 Austrian appointees in the same period was 42.3 years. These figures show that these promotions occurred on the average 5.4 years later than the corresponding promotions of all O.P. holding office in 1907.

THE NEED OF A REJUVENESCENCE OF THE O.P.

The average age of all O.P. increased in the space of half a generation just two years. In 1890 it was 51.5 years; in 1907, 53.5 years.

In 1890,	32%	were below 45,
	48%	between 46 and 60,
	20%	were over 60.
In 1907,	23%	were below 45,
	52%	between 46 and 60,
	25%	were over 60.

This table serves to show how the increase of the average age was brought about. The percentage of O.P. above the age of 45 has increased from 68% to 77%; that of the O.P. below the age of 45 has decreased from 32% to 23%. In other words, the reason for the increase of the general average is the decrease or total disappearance of the younger O.P.

That this state of affairs is pointed to by the advocates of reform as being unfortunate for instruction as well as for science itself, it is needless to tell. They go so far as to assert that, in view of the possible ascendancy in international competition of younger nations with fresher forces and with new ideas, it is apt to prove fatal. A teaching staff or a faculty composed mainly of old professors incurs the danger of becoming stagnant by its disdain of innovations. Confronted by the authority vested in a celebrated name, a departure from accepted doctrines is rarely attempted and is apt to be repudiated as an unwarrantable intrusion upon a privileged domain. Students, in view of the O.P.'s position of absolute power, are prone to preferably choosing those courses which conform to his personal opinions and methods, and in the particular disciplines which he favors. Under such circumstances, new methods and new directions of thought are strangled at the start, and many a promising idea finds an untimely end.

It is also not beyond the range of possibility that even an eminent scientist, rendered less active by old age or infirmity, may thereby fall behind the times. In such a case the whole branch of studies in his charge may, and has been known to, lie prostrate for years in that particular university and the number of students steadily to decline. This could easily

have been avoided if a second professor with equal authority had stood by his side.

SOME STATISTICS UP TO DATE

Statistics, compiled by the writer, show that during the seven year period extending from 1907 to 1914, which may be said to embrace the time of active agitation for reform, the increase in the number of O.P. amounted to 5% against an increase of 20.1% in the number of N.O.; 5.1% for the E.O. and 31% for the P.D. These figures indicate that no appreciable changes, other than those stamped by custom as normal growth, seem to have occurred in the make-up of the teaching staff of the universities, unless one cares to point out that the P.D. appear to have increased more rapidly than ever before.

That the authorities, in the appointment of teachers, have maintained the even tenor of their ways is also suggested by other facts:

(1) The average age of both, O.P. and E.O., has increased since 1907. But, while that of the former did so but slightly, namely from 53.5 to 53.8 years, the E.O. of 1914 with an average age of 47.25 were more than a year older than the E.O. of 1907.

(2) The ratio of the average number of students to O.P., which in 1910 was 43 to 1, has increased so that in 1914 it was 50 to 1.

(3) Figuring by faculties, there was in the period from 1907 to 1914 an increase of the number of

Ordinary Professors		Students
In Theol.	15%	10%
In Law	15%	19%
In Medic.	19%	28%
In Phil.	51%	43%

In the theological faculties the percentage of increase in the number of O.P. was relatively large. This is to be explained only by the fact that the division of this faculty in several institutions into a protestant and catholic section makes virtually parallel teaching staffs necessary.

The large increase in the number of O.P. in the faculties of law most likely was unavoidable since, even as now constituted, their allotment of O.P. is small, if their large percentage of students is considered. This displacement, of course, is justified; for instruction in law is carried on chiefly by the lecture method and in seminaries where one O.P. may supervise a relatively large number of students. High, nevertheless,

as the percentage of increase was, it did not fully meet the requirements. While in the theological faculties the number of E.O. had remained stationary, in law it was found necessary to add over 25%. This fact, if one considers that the P.D. in law also increased by nearly 30%, not only suggests that the work of the N.O. is figured on by the authorities as a substantial factor in instruction but gives room to the suspicion that E.O. sometimes fills places for which ordinary professorships should be created.

The same is true in the medical faculties. Here the O.P., after an increase of 5%, constituted in 1914 but 19% of the total ordinary force, and that in spite of the fact that 28% of the student body are medical students, and that in medicine, with its institute, clinical, and laboratory work, the need of instructing and supervising small groups of students renders imperative the presence of more teachers than in theology or law. These teachers to be sure are forthcoming, but in the capacity of E.O. who, having been increased by 10%, now outnumber the O.P., and of 124 P.D. who were added to the 426 P.D. active in 1907.

That in philosophy and the natural sciences the exigencies of instruction demanded more ordinary teachers than were installed is shown by the increase of nearly 30% in the number of P.D., a fact which leaves no other conclusion than that the government side-stepped paying for something which it knew it could get for nothing.

That this apparently is the policy which is being pursued is further demonstrated by the fact that in the large institutions, but also in some of the smaller ones, such as Freiburg, Heidelberg, and Jena, the attempt to compensate for the inadequate number of O.P. by a disproportionately large number of E.O. is quite obvious. And the argument is clinched by figuring the average number of students for each teacher by faculties. In doing so, we find in 1914 for each O.P. in

Theol.	34	students
Law	62	"
Medic.	72	"
Phil., Nat. Sci.	43	"

The numbers become more equal when the number of students for each one of the O.P. and E.O. combined is computed, namely,

Theol.	26	students
Law	48	"
Medic.	34	"
Phil., Nat. Sci.	25	"

They become reasonable only by also including the P.D., namely,

Theol.	21	students
Law	37	"
Medic.	16	"
Phil., Nat. Sci.	16	"

There can be no doubt that in the faculties of medicine the absence of any considerable part of the N.O. would seriously impair efficiency of instruction. Nor could they be spared in the natural sciences.

The inadequacy of the number of O.P. in the larger universities, even for the lecture form of instruction is so marked that, of late, members of the student body have taken a hand in the discussion of the problem, their chief point of complaint being the resulting lack of inner contact between professor and student. The idea of the lecture form of instruction as the chief implement of university education, one writer suggests, is a mistaken one anyway. The lecture is over-emphasized. "It should be superseded by the general discussion of topics, consultations and conferences, in brief, by the substitution of the personal equation for the dead letter."

Unfortunately, however, just those forms of instruction in which personal contact is supposed to be most essential, the seminaries for instance, seem to furnish the most glaring examples of the evils which present conditions give rise to. A good illustration of these is found in the description of a concrete case by Professor Bernheim of the University of Greifswald, at one time its Rector, and now O.P. of history.(2)

After stating how Leopold von Ranke was the first to establish these seminaries for a limited number of his best and most advanced students,—that his successors perpetuated the practice so that finally they became fixed institutions in all German universities,—that usually one member of the seminary reported on certain scientific investigations which afterward were criticised and discussed, or investigations were undertaken in common, whereby the literature passed from hand to hand,—he suggests, regretfully, it would seem, that now obviously it is no longer possible to proceed in this way when, instead of the former ten or twenty members, from fifty to a hundred participate. "And that," he writes, "is now everywhere the case. Even in such a small university as Greifswald, I and some of my colleagues have had for a number of years in the neighborhood of, or over one hundred members in the seminary." "Confronted by this entirely different situation," he asks, "what is one to do?"

"But few teachers have the courage to simply shut the door

when the original normal number of twenty of the select has been admitted. That would be at least consistent, though, to be sure, justified only if those excluded are certain of being taken in charge by other colleagues. . . . For the greater part one meets the situation by simply acting as if not a hundred but the modest circle of old were present and lets it go at that. Here and there perhaps one distinguishes between ordinary and extra-ordinary, or active and inactive members."

"Inactive members!" he exclaims, "the inner absurdity of the whole thing can scarcely be more plainly expressed: *Ein inactiver Arbeitsunterricht!*"

"There they sit, in the front ranks the few chosen actives with whose work the teacher is occupied, and the remainder, the great mass, sit behind and may listen. Whether or not they are able to follow is not of the slightest consequence. . . . Even if inclined that way, preparation for the topic under discussion even in a general way would be impossible since, as a rule, but one or two copies of the necessary books are to be found in the library. . . . Thus they sit there inactive in the true sense of the term; what they learn is more harmful than nothing: to squander their time in dull lethargy, —unless they prefer gradually to disappear. . . . But what of it? They have subscribed for their place in regular form and in their leaving certificates find gloriously certified that they have been members of the 'seminary.'"

Similarly, in medicine and in the natural sciences, the afflux to the laboratories is so great that larger lecture and work rooms have become a permanent need. In the largest universities the institutes for general anatomy, physiology, pathology, physics, chemistry, and other disciplines, have assumed extra-ordinary dimensions. Hundreds of students are accommodated and the rooms, as a rule, are filled to overflowing. Demonstrations in connection with lectures, because of the enormous size of the rooms, are practically impossible. Hence special demonstration rooms are provided, or opera glasses furnished to the students, or again, the desks are removed and the seats arranged in amphitheatrical fashion in order to shorten the air line between demonstration object and student.

In the laboratories, where make-shift methods would avail nothing since instruction of such masses of students by a single teacher is impossible, the attempt has been made to improve matters by dividing the attendance into groups, whereby instruction of the more advanced students is carried on by the director of the institute in person while the remainder, under his supervision, is left in charge of an assistant. But even this general supervision sometimes develops into a

task beyond the power of one man and in that case the only alternative has been resorted to, namely, the establishment of a relatively independent division, whose head, however, with few exceptions is but an E.O. [Compare: (14).]

To multiply descriptions of this sort would serve no purpose. Enough has been said to show that there appears to exist some basis of truth for the claim of the N.O. that elimination of some of the difficulties under which instruction is carried on depends ultimately on a sufficient increase in the number of ordinary professorships.

WHY THE NUMBER OF ORDINARY PROFESSORSHIPS REMAINS LIMITED

The question arises: Why is there no adequate increase in the number of O.P., or, as the N.O. would put it, why are extra-ordinary professorships maintained in places where O.P. are necessary? As amplified by them, it is to be answered by saying that the blame rests foremost with the government. Economy, they suggest, surely is one reason. Expenses in behalf of the universities have in the last few decades grown enormously, amounting in 1908 in Prussia alone to about \$4,250,000, of which over \$1,500,000 went for salaries of teachers. Reason enough for economy, they say, and since the supply of teachers exceeded the demand, the State simply took advantage of the situation.

As a second reason for the retention of many E.O. in the subordinate position they advance a partly presumed, and partly demonstrated, policy of the State authorities to maintain as far as possible but one ordinary professorship in each one of the various departments of a faculty. This is done, they declare, to avoid friction which may result from a clashing of authority. But the principle of subordination is transferred automatically from the sphere of administration to the realm of the university where the lack of the spirit of collegiality adds neither to the results of academic instruction nor to the dignity of the teaching profession.

Thirdly, it is asserted, in the filling of academic positions and in their gradation, a collateral factor has entered in the aim of the government to secure as strong a hold as possible upon the good will of the teaching force. There are nine distinct grades below that of the O.P. and, while it is not necessary to ascend the scale step by step, yet they present to the State a wealth of opportunities, by promotion now and then, to keep the teachers in good humor and earn their gratitude without much expense.

Last, but not least, the faculties are held to be responsible

for the system of assistant teachers, "now in its fullest bloom." It is not difficult to appreciate the fact, they intimate, that the O.P. of a department, its only representative in the faculty, its recognized expert whose voice is decisive in all matters which concern it, after enjoying this perfect monopoly does not relish the idea of dividing his authority with another. In the capacity of director of an institute he likewise reigns alone, and as absolutely. What then is more natural, they ask, than that he, "a little czar in his dominion," hesitates to endanger his sovereignty by encouraging or expediting the advancement of a possible rival?

To attempt, from this distance, to sift the proverbial grain of truth from these contentions would be unprofitable. That the State, in so far as it is responsible for the system, has followed, as one writer puts it, "the principle of reasonableness in the economic rather than in the moral sense of the term," seems indeed reasonable. That occasionally personal considerations enter in determining a vote in the faculty is nothing strange to human nature. It is to be kept in mind, however, that the testimony emanates from not entirely disinterested sources.

THE DEMANDS OF THE N.O. ANALYZED

As outlined by the Association of Prussian E.O., the following changes are called for: The "assistant-teachers" system should be abandoned and the principle established of filling only with O.P. all positions which represent a real teaching need. Accordingly, a majority of the E.O. should be promoted. The remainder should be granted a part in the corporate life of the universities commensurate with their importance for instruction and with their position as State officials. At greater detail, some of the following changes are held to be desirable:

(1) E.O. should have a vote in the election of the rector and of members of the senate. They should have representation in the administrative bodies of the university.

(2) E.O. should be kept informed of all faculty discussions which concern matters of instruction.

(3) An E.O. should have voice and vote in the faculty in all affairs which concern his department, whether in charge of an O.P. or not.

(4) E.O. should have equal rights with faculty members to act as referees of dissertations suggested by them, and as representatives of their department in the oral examinations.

(5) E.O. should have equal rights with the O.P. to the use of rooms and paraphernalia in the institutes and seminaries.

(6) E.O. should receive a salary equal to that of other State officials of similar standing.

The petitions of the P.D., more moderate in nature as well as in language, call for an urgently needed increase in the number of positions for N.O.; a place in the discussions of university affairs; a hearing concerning their own affairs in future revisions of university and faculty statutes; and an opportunity to appear before the faculty and express an opinion in their own affairs, except where questions concerning promotion are involved.

Commenting first on the requests of the P.D., it is to be recalled that many help to swell the great body of N.O. though but loosely connected with the university. This is especially true of medical men, who, actuated sometimes by ulterior motives, have maintained their connection with the university though not exercising their right of docentship to a greater extent than was absolutely necessary. The opportunity for abuses rested in the fact that, except by disciplinary process, the *venia legendi* was inextinguishable. It was to be foreseen that efforts for reform would be directed first toward a possible weeding out of all undesirable elements. And that was precisely the course which the authorities pursued. The initiative for securing a legal basis for this process of house cleaning was taken by the philosophical faculty of the University of Berlin which, in 1911, by ministerial decree was empowered to amend the faculty statutes by inserting that "the *venia legendi* expires by waiver." Equal to a waiver is regarded (1) failure to announce lectures for two successive semesters, (2) unjustified failure to lecture during four consecutive semesters, (3) removal without special permit from the university city or its nearest suburbs, (4) acceptance of a major extra-academic position, except with the consent of the faculty. The lead of Berlin has been followed by other universities and amendments of the statutes are apt to be forthcoming where circumstances warrant a change. An objection to the regulations in their present form grows out of the fact that the *venia legendi* is presumed to expire automatically, so that a P.D. may be deprived of his right without being aware of it. An intentional indefiniteness of language, however, appears to allow the faculties great latitude in their decisions.

Concerning the request of the P.D. for an increase in the number of non-ordinary positions, there is no doubt that an official recognition of their work, though by nothing more than a teaching commission, would prove advantageous. By rendering possible a better organization of instruction, the establishment of introductory courses, the grading of seminaries and exercises, etc., a change in this direction might be beneficial.

The arguments of the objectors can, for the most part, be reduced to an ignorance of conditions.

The plea of the P.D. for consideration in the event of future changes in the collegial organization of the universities is more apt to find favor. As integral parts of the teaching force they claim to be entitled to however a limited representation in the affairs of the university, and more particularly do they desire a share of the rights which the faculties exercise in their capacity as teaching bodies, for example, in the examinations, the procuring of teaching material, construction of the lecture plan, etc. The Austrian P.D. for a long time have enjoyed some of the rights which are here petitioned for. In part they were also incorporated in some recently revised statutes of non-Prussian universities. With these precedents before them, the authorities may be expected in time to look more favorably upon such innovations.

Coming next to the demands of the E.O., it is to be admitted that their objective data constitute a not well disputable argument for the need of more ordinary professorships. But changes, as radical as the E.O. insist upon, are not easily brought about. The prevailing method of filling vacant chairs and creating new ordinary professorships takes into consideration the dual position of the universities so that the central and the academic authorities co-operate in the exercise of these functions. On part of the universities, the general statutes of the institutions as a rule impose upon the faculties the obligation "to provide for the completeness of instruction" and this includes the function, whenever the faculty feels that it is not strong enough to fulfil this obligation, to notify the ministry that it disclaims future responsibility in that respect, and to bring forward its detailed proposals. The faculty statutes usually provide, or when they do not, it is customary, for the faculties to propose three names for every vacant ordinary professorship. Of these the State authorities may recommend to the Sovereign the one best qualified for appointment or they may, if none seem suitable for the position, ignore them all. It will thus be seen that, when the E.O. assail the State's apparent trend to economy, they do not sufficiently appreciate that the establishment of new chairs does not involve merely the question of means for the larger salaries, and when, at the same time, they question the motives of the faculties, they attack in reality the whole system of appointment,—a system which, by means of the right of nomination by the faculties, furnishes a certain guarantee for the scientific ability of the candidate, tends to prevent the development of a ministerial absolutism, and serves as a protection against political pressure, while, by the fact that the final

selection rests with the State, it acts as a check upon pernicious influences in the faculties; nepotism, sects and coteries, who might hold sway if they alone had the say in the appointments.

The lack of moderation of the E.O. is perhaps to be excused in view of the trying conditions developed by the fact that, judging by the past, it is unlikely that the authorities will consent to such a wholesale scheme of promotions as they propose.

In law, where the exigencies of the times call for a close alliance of the study of law proper with the newer science of the State and its foundations, the demand for the establishment of a faculty of political economy sometimes has been opposed by the faculty of law for no other reason than an assumed "numerous clausus" of the ordinary professorships.

In medicine where, in consequence of specialization, new departments grew up, the faculties refuse to acknowledge the importance of some of these and oppose the establishment of full professorships on the ground that they are subsidiary rather than independent departments, or on the ground that a change would involve the danger of a splitting of instruction and the certainty of adding to the difficulties of study and of examinations,—reasons which, in the opinion of men qualified to speak, will not bear the test of closer scrutiny.

In the philosophical faculties, more particularly in the mental sciences, the ordinary chairs are not as well defined as in the upper three faculties. Here it happens that chairs hitherto filled by O.P., through the lack of a suitable successor, are temporarily given to an E.O., or extra-ordinary are changed into full professorships because only on that condition could a desirable successor be secured, or again, one chair for two equally important divisions of a science is occupied here by a representative of one branch, there, of the other. By this instability, since an increase in the total number of ordinary professorships is, as a rule, contrary to the wishes of the faculty, the causes for dissatisfaction naturally are multiplied and the filling of vacancies is apt to be accompanied by pointed discussions.

A recent incident of this sort brought to a point a crisis which has existed in a latent state for a number of years and which, since the whole episode is highly illustrative of the intricacies which surround the full professorship problem, deserves some space.

The philosophical chairs in most of the universities are occupied by professors of pure philosophy, so called, but in a few by psychologists. In the early part of 1913, a short time after the appointment of a psychologist to a chair of philosophy, a declaration, signed by 106 academic teachers, was

sent to the faculties and administrative bodies of all German universities, protesting against the filling of chairs of philosophy with representatives of experimental psychology or men whose chief interests lie in that direction. During the infancy of this science, it was explained, the combining of the two disciplines in question under the charge of one O.P. was inevitable. But with the most gratifying rise of experimental psychology in late years its sphere of activity has grown so much that now for some time it is recognized as an independent science which demands the whole efforts of one teacher. Since the interest of academic youth in philosophy is likewise in the ascendant, the withdrawal from that science of chairs formerly dedicated to it exclusively is felt as a keen injury. In view of all this it would be to mutual advantage, and it is to be recommended, that experimental psychology have its own chairs in the future and that, wherever originally philosophical chairs are now held by psychologists, new professorships be established for the latter.

At first glance, the impartial care with which both branches are here provided for leaves the impression that motives only of a strictly objective nature guided the action of the signers of this declaration. The initiated, however, recognizes instantly the deeper significance of the procedure. Stated more succinctly, their purpose was to reclaim for philosophy all now existing ordinary professorships while suggesting that for psychology new chairs be established. Under the circumstances, pictured above, surely a strange way of balancing justice this which, as one writer puts it, "gives a hundred dollars to one, and promises them to the other." Excellency Wundt, with his intimate knowledge of conditions and his customary astuteness of analysis, did not take long in exposing the real issues of the case and pointed out that the ultimate result of a course as that proposed in the declaration would be the shifting off of experimental psychology into the natural sciences, more especially into the sphere of the medical sciences. "It's real meaning," said the historian Lamprecht, "when one penetrates through hides and tissues to the skeleton of this clever declaration, is nothing less than that so-called pure philosophy is set in array against the independent development of psychology within the frame of the philosophical sciences." "Out with the psychologists!" is the battle-cry.

And these charges some of the signers of the declaration do not at all deny. Psychology, Rickert and Natorp declare, by the introduction of experimental methods, has become a "Specialwissenschaft" which, adds Simmel, so far as he knows, "has produced nothing either positively or negatively of importance to specifically philosophical pursuits."

To elaborate on the pros and cons of the argument is beyond the scope of this work. Enough has been said to show the precariousness, not to say hopelessness, of the cause of the E.O., when men of science, in order to gain their personal ends, do not hesitate to resort to intrigue for the purpose of influencing members of other faculties who are not familiar with inside conditions.

The attitude of the State toward the establishment of new chairs, on the other hand, is more likely determined by larger considerations than those attributed to it by the E.O. For it is hardly conceivable that the State, by condoning petty policies and devices, will incur the risk of impairing the efficiency of the universities,—those institutions who, by the power and extent of their influence, constitute one of its strongest pillars. The central authorities alone, owing to their advantageous position, are able to survey the university system of the Empire, and judge of its needs. The State, therefore, may be presumed often to be guided in its actions and policies by motives which to individuals or even to faculties remain obscure, yet make for the welfare of the system as a whole.

In the matter of an enhancement of their rights in affairs of administration and instruction the efforts of the E.O. are apt to be crowned by better success. With the general decree of 1910 for all Prussian universities as an entering wedge, with a precedent established in recently revised statutes of several universities, and with the organization of the professor-collegium in the Austrian institutions as a model, they enjoy in addition the advantage of having the best of the argument.

SOME RECENT REFORMS

Aside from the new salary regulations for Prussia of April 1, 1909, the organized efforts of the E.O. thus far have produced but one more general result in the Prussian royal decree of May 30, 1910, already referred to, which provides that *etatsmässige* E.O., active in a special discipline not represented in their faculty, have a seat and decisive vote in that faculty in all matters related to that special discipline. The decision of the question as to which disciplines are to be regarded as special ones is made to rest with the minister of education. It provides further that the right to elect the rector from the midst of the O.P. henceforth be extended to the E.O. with the restriction, however, that the total number of the E.O. qualified to vote must not exceed one half of the total number of the O.P. The right of the E.O., when a limitation of their number becomes necessary, is to be determined by seniority.

In the non-Prussian universities, more notable concessions have been made.

(1) The general statutes of the University of Jena, published in 1907, provide that H.P., E.O., and P.D., if necessary, may be called upon to give opinions, judge dissertations, and take part in examinations, in which case they are entitled to a vote and to a share of the fees.

(2) In the new statutes of the University of Tübingen, "revised in accordance to the spirit of the times," and published in 1912, the N.O. receive consideration to the following extent:

(a) Three N.O., elected for a term of three years, are entitled to a seat in the larger Senate, and one N.O. in the smaller Senate.

(b) All H.P. and E.O. in charge of a special discipline or of an institute, are entitled to a seat in the Professor-collegium in all matters concerning their departments, inclusive of promotions. Other H.P. and E.O., with the permission of the ministry, may also be given seat and vote in the faculty.

(c) N.O. are excluded from deliberations concerning the filling of vacant ordinary chairs, but may be consulted by the faculty.

(d) H.P. and E.O. take part in the election of the rector, but their number is restricted to one half the number of the O.P.

(e) All teachers outside the collegium have the right to be heard in their own affairs when they concern their person or their activity as teachers.

(f) N.O. are eligible to membership of committees of the smaller Senate, if appointed for the transaction of special business.

(g) For purposes of consultation, N.O. may be requested to attend meetings of the faculty and of the larger Senate.

(h) Records of the proceedings of the smaller Senate are open for inspection to N.O. members of the larger Senate.

(3) By ministerial decree of April 24, 1913, H.P. and E.O. of the University of Jena are accorded the right to participate in the election of the prorector, but with the restriction as to number in vogue in the Prussian universities. The N.O., furthermore are entitled to representation in the Senate by a committee of three, which takes part in the deliberations concerning their interests but has no decisive vote.

(4) In the University of Freiburg, in 1913, H.P. were granted the right to co-operate in the election of the prorector,

with restrictions as to number. The resolve further provided that every teacher should be made acquainted with all decrees of the administrative bodies which affect the common interests of the teaching force.

(5) In the three Bavarian universities, Munich, Würzburg, and Erlangen, where for sometime N.O. have co-operated in the election of the rector, a royal decree of July 22, 1913, granted them additional rights as follows:

(a) E.O. in a special discipline, or when directors of an institute, have a seat and vote in the faculty in all matters concerning their discipline or institute, promotions included; excepted are matters concerning the filling of chairs other than those of extra-ordinary professorships.

(b) The faculty may invite for consultation teachers or officials who are not members of the faculty in the narrow sense of the term. With the consent of the faculty, the dean may empower teachers outside of the faculty to report on faculty affairs, and they shall then have a decisive vote in the matter. Such matters are, more especially, promotions.

(c) Every teacher has the right to be heard in his own affairs concerning his person, his teaching activity, or the institute directed by him, except concerning vacancies, promotions, and teaching commissions.

(d) At least once during the academic year, and further upon the request in writing of ten teachers, the dean shall call a meeting of the faculty in the wider sense of the term: At this meeting, wishes and suggestions in faculty affairs shall be in order, all except those concerning vacancies, promotions, and teaching commissions.

THE NEW UNIVERSITIES

The new University of Frankfort, the Göthe University, as some propose to call it, has introduced in its general statutes, so far as the rights of the N.O. are concerned, but one innovation. As in all other Prussian universities, the E.O. co-operate, with numerical restrictions, in the election of the rector and have voice and vote in the faculties in all matters concerning a special discipline not otherwise represented. But in addition they are given some representation in the administrative affairs of the university in the form of an E.O. who is elected annually to membership of the academic Senate.

In the matter of faculties and the make-up of its governing bodies the university presents some unique features. The theological faculty is conspicuous by its absence. On the other

hand, the new university stands alone in having a "Wirtschafts- und Socialwissenschaftliche Facultät," a faculty of sociology or "Kulturwissenschaft."

The regulations governing the composition of the chief administrative body of the university are unusual in two respects. They expressly state that all professors and P.D. are ineligible to membership of the Great Council, with the exception of the rector and the prorector, who are members ex-officio. The deans may be called in when faculty business is to be considered and in that case have voice and vote. The State, likewise, has no representative in this body. The Council is distinctly municipal in its membership. Then again, in a second, smaller body, "the Curatorium," the teaching force of the university as such has absolutely no share in the administration of the university. Frankfurt, accordingly, closely approaches the system which prevails in American universities where the president, as a rule, is the only representative of the university in its governing board.

Two other German cities are contemplating the establishment of a municipal university, namely, Hamburg and Dresden. Of these, the plan of Dresden is in its primary stages and, in view of strong opposition by the University of Leipsic, is likely to remain there for some time to come. In Hamburg better progress has been made and the plan for the new university has taken more definite shape. It is proposed for the present to omit faculties of theology and medicine but to introduce an innovation in the form of a faculty for Colonial Sciences.

Concerning the teaching staff, the Prospectus states that E.O. for remote and special disciplines are considered still necessary, but only salaried E.O., with an annual salary ranging from \$1,250 to \$2,250 and all lecture fees in full, will be appointed. They are to have a seat and vote in the faculty even though their discipline is represented by an O.P. With a restriction as to number they will be entitled to take part in the election of the rector, and they are to have additional representation in the administrative affairs of the university in a new body to be known as Professorial Council.

But all these plans, like many others, it is sad to recollect, may be upset by the work of that grim reaper who just now stalks about Europe's blood-stained battle-fields, and who knows no distinctions between E.O. and O.P.*

* The following statistics, compiled by the writer from authentic sources, will serve to give an indication of the effect of the war on the universities:

Total number of students enrolled in all German universities:

Summer Semester 1914.....	61254
Winter Semester 1914-15.....	52547
Of these in military service, 30104.	
Summer Semester 1915.....	53556
Of these in military service, 34386.	

Total number of active academic teachers: (exclusive of H.P.)

March 1914.....	1197 O.P., 740 E.O., 1250 P.D.
August 1915.....	1250 O.P., 801 E.O. 1201 P.D.

Of the latter, in military or auxiliary service in 1915/16: 205 O.P., 269 E.O., 551 P.D., distributed among the faculties as follows:

Theology	9 O.P. of 181, 7 E.O. of 50, 11 P.D. of 52
Law	35 O.P. of 188, 16 E.O. of 55, 26 P.D. of 68
Medicine	81 O.P. of 247, 146 E.O. of 291, 301 P.D. of 520
Philos., Nat. Sci....	80 O.P. of 634, 100 E.O. of 405, 213 P.D. of 561

Number of deaths on the battle-field:

Winter of 1914-15.....	6 O.P., 3 E.O., 6 P.D.
Summer of 1915.....	4 O.P., 3 E.O., 15 P.D.

A notable fact is the steady increase in the number of women-students. There were enrolled in all German universities:

Summer Semester 1913.....	3400 women
Winter Semester 1914-15.....	3920 women
Summer Semester 1915.....	4569 women

the latter distributed among the faculties as follows: Theology, 7; Law, 116; Medicine, 1,189; Philosophy and the Natural Sciences, 3,225. (Not known, 32.)

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A SMALL BOY'S NEWSPAPERS AND THE EVOLUTION OF A SOCIAL CONSCIENCE

By L. C. DAY, Waynesburg College

I

While yet five years old, I began to issue from my small boy's desk, with only paper and pencil for equipment, an imitative monthly "Delineator" and a weekly "Boston Sunday Journal." Both these pretentious publications, despite their very different names, were much alike in content, with each comprising several small smudgy pages covered by scrawling printed word-lists and numberless sketchy drawings of railway locomotives, family portraits, kitchen stoves, and such other drawable articles as had entered into my varied though limited small-boy experience. From time to time the "Delineator" undertook to reproduce "fashion plates" from its original, while the "Sunday Journal," though patterned chiefly after the pictorial section of its real-world prototype, came to include a few personal items on domestic and neighborhood affairs.

A more systematic effort was the "Boston Evening Record," which began to appear daily about a year later. This presented quite regularly three pages of coarsely printed news with small illustrative sketches and a last page of special "feature" pictures, very frequently showing fearful railroad collisions and shipwrecks, and as is sometimes the case with the metropolitan papers, the Friday issue was always double-size and largely filled with the "bargain advertisements" of the local stores. During its brief history of less than a year the "Record" was my only regular publication, but occasionally I made up a "Boston Sunday Globe," or a "New York Journal," or perhaps a "Youth's Companion," and before I was seven years old no less than twenty New York and Boston newspapers and periodicals had been paid the high tribute of boyish imitation. Many of these papers I kept to myself, quietly stuffing them away in an unused desk drawer at home, but after the first year I gathered sufficient courage and pride to deliver each fresh number to my elderly Aunt Nancy, living next door, who paid for them at the liberal rate of one cent a week. Some weeks, particularly in midwinter, my aunt

might receive a paper nearly every day, but in summer, as my fancy turned out of doors, she was fortunate to get even the highly colored Sunday issue which I liked so well to print. Under all circumstances, however, the subscription rate remained at one cent a week, until, in early adolescence, publishing what I considered "an Ideal Twentieth Century Newspaper," free from sensationalism, with news and features of both local and international interest, the price was boldly advanced to "two cents the week; published weekly at \$1.04 the year."

The natural growth of my inventive power, very perceptibly hastened by my older brother's teasing threats of arrest for copyright infringement, at length led me to adopt the original name of "United States Journal" and to consolidate all papers under that head. The Journal, succeeding as it did the "Evening Record," began as a daily, but it shortly became a triweekly, which, in turn, evolved into an enlarged weekly, with from six to twenty pages, appearing on Sunday morning. This concentration of effort into one Sunday paper resulted in a gradually widening variety of contents, and besides local and general news there came to be numerous jokes, puzzles, original stories and colored comic pictures. The lighter interests of "children," such as rebuses, "experience" letters, plays and games, and so on were set off on a separate page. Woman was specially treated in a column often labeled "For Lady's Eye," containing, in early times, the inevitable locomotives and cars, but later, as my appreciation of sex grew, such vital things as hats, patterns and recipes. In these various supplemental features are reflected the passing fancies of the metropolitan newspapers, and the height of each craze is easily traceable in the Journal's spasmodic prize offers, doll cut-outs, free "paintings," magic colors, invisible pictures and what not. It finally became necessary to segregate these many novelties in a Regular Feature Section, fully illustrated and decorated in color.

Little by little the Journal evolved a characteristic make-up and its later history is one chiefly of gradual improvement. Coarse scrawling letters and scribbled, half-meaningless pictures develop slowly into a compact "twelve-point" Gothic print (with head- and title-line variations) and carefully copied pictures made to imitate half-tones. A standard issue consisted of six large (five by eight-inch) and six small half-size pages, sewed together in two sections labeled respectively "News" and "Regular Feature." Like the earlier papers, the Journal was printed in lead pencil and crayon, and never more than one copy of one issue was made. Save during warm weather, publication was very regular, and each number

was systematically arranged and printed as neatly as possible with soft lead; while the contents, especially in later times, were well balanced between news, feature and advertisement. In the News Section appeared the week's leading current events under modest headlines, a column or two of local happenings, a few personal and local advertisements, and an editorial page, besides miscellany in the way of jokes, quotations and perhaps an instalment of a serial story. The Regular Features included copied special articles, "funny" pages, rebuses, original "letters" from "Jimmy" and "Aunt Nancy," and occasional back-kitchen talks by "Uncle Hiram," a Yankee variation of Mr. Dooley.

At eleven, though still quite proud of my printing skill and editorial propensities, I began to look upon my small newspaper as something very far from practical reality and extremely "childish." One penciled copy of the Journal a week, read by only one subscriber, appeared to me for the first time as a futile, if not even ludicrous, effort. Then, too, though resorting to carbon tracings for accuracy, I became increasingly sensitive about my inability to draw faces and well-balanced decorations, while I was much bothered by the lack of proper shading and variety in my lettering. The only remedy for the situation seemed to be a printing-press. Urged on by an interested chum, I persecuted my parents until they gave me a small press on Christmas. Soon after getting this I set out boldly to print my paper in "real fashion," but typesetting quickly became tedious, and the first press-printed Journal never went beyond a half-column of mis-set composition. The press was such a disappointment that even the old hand-printed journalism fell into neglect for several months.

But youth is an age of memories and sentiment as well as of reticence and childhood scorn, and frequently as the months advanced I thought yearningly of the "old" days when I had been "Editor." In the new light of painful typesetting experience hand-printing began to appeal to me again as something very enjoyable and perhaps really worth while after all. After sending a very formal Letter to Old Subscribers, I issued the Journal anew, beginning shortly before my thirteenth birthday. For three months the Journal appeared regularly, showing a very high level of development, though the close sentimental conformity to the earlier make-up seems to have retarded progress. An ambitious Christmas number of nearly forty pages marks the passing of the Journal as a regular publication. The printing spirit, however, persisted for several years, though I was quite able to confine its outbreaks merely to the holiday season; when on the Sunday before

Christmas I published a serious-minded Christmas Annual having from thirty to sixty pages, in three or four sections, all bound in a white-cloth board cover. The last of these Annuals was quite elaborate, containing sixty pages besides a twenty-page almanac, and presented stories, poems, editorials, and various special features selected from a year's gleanings of the magazines and newspapers as well as the Editor's school papers. Still later, in deference to my aunt, who moved from town, I revived the Journal for a few months, thinking that my printing would be less trying to her dimming eyes than my script. The last issue, No. 510, appeared as a Grand Review Number on May 28, 19—. I was then eighteen years old.

The United States Journal was undoubtedly the central predominating interest of my boyhood. Printing was my one great mode of expression. I was not, however, so precocious or abnormal as to refrain from the common boyhood plays and sports, nor was I without passing vocational interests. In course of the week, besides being mere boy, I was, at sundry times, Captain, Center, First Base, President, General, Admiral, Postmaster, Boss, Banker, Engineer and what not. Yet beneath all these guises was the Editor. While actually engaged in pastime I was, naturally, quite oblivious in my enthusiasm of all the sterner duties of life, but after the play was over the Editor stepped forward to sift out any incidents of news value or to unearth some abuse worthy of an editorial. I also encouraged my chums to advertise, if they should have any toys or mechanical inventions of their own to sell, or if they specially desired to earn "pin money" by carrying washings or throwing in wood. Nor were the grown-ups exempt, for I frequently quizzed my mother or sister for news, and as I called upon the neighbors I always kept an ear open for the latest scandal.

Like every boyhood "business in life" my editing and printing were taken very seriously. The earliest legible papers bear the imprint of a definite corporation known as "L. C. Day & Co.," and from the first the Management was exceedingly sensitive as to Office Hours, and formulated explicit Rules regarding time limits for the acceptance of contributions and advertisements. Office Hour Schedules were usually printed on small slips to be distributed to interested parties:

OFFICE HOURS

Of L. C. Day & Co!, on, Jan. 18, 19—; MONDAYS, TUESDAYS, WEDNESDAYS, THURSDAYS AND FRIDAYS. 7.00 p. m. to 7.30 pm. Sundays, 11 a. m. to 11.30 a. m. and 6.30 p. m. SATURDAYS, 9.00 to 9.30 a. m. 11.30 to 12.00 m. 1 to 1.15 p. m. and 7.00 p. m. to 8 p. m.

Next change not know.

These hours indicate times when the Editor was likely to be found at his desk printing. The Office Rules appeared with marked regularity on the Journal's Editorial Page, immediately below the Subscription Rates:

OUR RULES FOR 19—

We will receive no ads anyway after Wednesday's at 3.00 p. m. for the next Sunday's edition. We do not like to receive much news after Saturday's at 5.00 p. m. for the next day edition. Send for one of our office Hour bills. Free to Journal readers only. Address U. S. Journal Co., Dept. 128. Section 17.

The "& Co." was generally a pure fiction, although now and then my older brother or some chum entered into partnership, perhaps acting as a "reporter," "contributor," "news-boy," or the like. At one time, when a boy living nearby moved to R—, seventy miles away, we entered into an agreement whereby he was to issue a kind of second edition of the Journal from his new home. The R— paper appeared spasmodically for a little while and then failed, but for some months my Journal continued to publish the Make-Believe circulation figures of the R— Edition, and frequently mentioned the R— Office. Again, choosing a partner from among my chums simply as Reporter, I boasted, besides the Local Office at 3 Memorial Street, a Branch on South Main Street. At best, however, these early partnerships were ephemeral onesided affairs, for I appeared to be the only true journalist in the neighborhood, and each alliance automatically dissolved after a few weeks of rather irritating team-work, or as both chum and myself tired of his silent partnership. My editorial career on the whole was lonely, and developed according to my own personal interests and desires.

My methods of printing of course varied at different times, but for the most part I followed a very rigorous system. At ten, for instance, I did things in this wise:

WHERE THIS NEWSPAPER IS PRINTED

(Written and Copied by L. C. Day)

In this room [referring to a sketch of the Office] is where this great paper is printed every week. It is where it is put into press also. The editor's room too. The M. B. [Make-Believe] Circulation is very high. A big business is done too. Now we must tell about the paper. The magazine is started the Sunday before issued and filled up thorough the week. The Queer Pictures [magic "invisible" pictures] are made Sunday evenings before issued. The paper is started Sunday p. m.'s before issued. But when the great rush comes is Saturday evening. Work is done quickly. The editor has to work with all his might and main, . . . THE END. . . .

Saturday evening was always a very busy time, but at

Christmas, with an immense holiday number on his hands the Editor was rushed to the point of exhaustion. Though he might begin the Christmas paper three weeks ahead (often the Journal was omitted the first two Sundays in December), the task of collecting Special Features and filling thirty or forty pages with text and illustration was no mean one, and on the last Saturday the Office was a scene of great excitement. The hurried completion of Our Great Christmas Number of 32 Pages for 19— is characteristic:

VERY BUSY!

Dec. 21.—8:45 p. m.—We have just left off printing for the day. We begun to print this afternoon at 1:45 and printed until six o'clock p. m. Then about 6:50 we begun again and have printed till now, at 8:45, then the editor went to bed and has now got [up] at 8:00.

Dec. 22.—And is printing this piece of news. The editor says that Dec. 21 was the busiest day that was ever in the Journal office ever known, printing our largest Xmas number and largest edition of 32 pages and counting our music it makes 36 pages. It kept us busy all right I can tell you. . . .

After working entirely alone for about two years as the "U. S. Journal Co.," or simply as "L. C. Day, Publisher," I dallied for a time with numerous make-believe contributors, such as Mr. James B. Ow, editorial writer, W. R. Ross, cartoonist, and a certain spicy Miss T. O. Jinks, who wrote one or two skeptical letters on Marriage. But as I neared adolescence I turned again to my flesh-and-blood contemporaries, apparently in search of journalistic aid and sympathy, and during one fall I induced no less than nine of my schoolmates—six boys and three girls—to serve as a regular contributing staff to the Journal. Among them was an artistic musical lad who sent in a few "pianoforte compositions," cartoons and bits of verse; others supplied news, sketches and short stories, while one merely supplied a few magazine clippings to help fill out the Christmas Number. A young Miss Newman, most charming of the feminine contributors, favored me with two or three brilliant short poems which I published with great pride as "original" over a carbon fac-simile of the poetess' own signature: later impartial investigation, however, reveals her works as admirably exact transcripts of certain classical nursery rimes.

Though mine on the whole was a solitary industry, printing was not entirely without interest for the other boys of the neighborhood. When my own enterprise was yet new, my older brother, inspired by my crude efforts, published for a few months a very superior paper of his own which he called "The Union Press." This paper was a thrice-a-week, and purported to come from the office of "Day & Co., Job Print-

ing," a concern which condescended sometimes to admit me to its personnel as "Official Newsboy." The Press was delivered, like the Journal, to the next-door aunt at some small nominal price, though its published subscription rates in the Editorial Column read:

Price 5 c a paper.
<u>Terms \$18.25 a year</u>
Pay in advance or pay
<u>\$19.50</u>
Published a day
before hand.

The Press was always far more provincial than the Journal, for at no time did it print general world news or editorials, even though it was revived at two later times when my brother was quite old enough to have developed broad social interests. His model appears to have been the local village weekly, at the office of which he was occasionally allowed to set type and to pick up paper-trimmings. Still, even in its own field of local affairs, the Press to my jealous mind always seemed very immature and a disgrace to serious journalism, for there often appeared in its columns crude entries of this sort:

Clarence got up at 6:45 o'clock Tuesday morning.

We had breakfast at 7:57 Tuesday morning.

Mr. Day and Mr. Hunter got home from town meeting at 5:25 o'clock.

Ralph came down to our house to stay all night with Clarence.

Clarence did not get home from the drammer Tue eve till 10:45 and not into bed till 10:53.

Familiar personalities like these were forbidden the Journal's columns, save in the very earliest issues; I never referred to my chums without their surnames, and my own name, even in connection with relatively trivial events, was rarely set down as less than "Mr. L. C. Day."

I had no serious or respectful imitators until the later near-adolescent age, when my artistic musical contributor, inspired by a new set of rubber stamps, issued for a short time the "Fulton Weekly." Another young fellow, somewhat my junior, with no particular innate editorial or artistic ability, for a few weeks issued half under my direction the "B—— Recorder," a bi-weekly professing to devote itself to local interests, but which actually was a random compilation of light humor copied from the daily newspapers. Later, under more independent management, this became the "United States World," but this, too, was short-lived.

When twelve I became acquainted with Bernard Adams, a serious-minded grammar-school boy who had been brought

up on the "Outlook" and the classics, and who was at that degree of maturity which made him appear quite fluent on the ills of society and politics. He seemed to realize fully the menace of the saloon, the evils of stock-gambling, the coming rupture between Capital and Labor, and everything else which threatened the peace of humanity. On the other hand, he abhorred sensationalism and yellow journalism generally. We presently formed a partnership, in which he was to supply a few editorials and to advise on various matters of policy. Very shortly, under this management, the Journal, which had been rapidly acquiring a yellowish tinge, with a growing propensity for murders and robberies, became a thoroughly "clean" newspaper, with quiet headlines, little or no sensational news, and conservative editorials, directed for the most part against social and economic evils.

The partnership was known as the "Day and Adams Publishing Company," and shortly a new paper, the "United States Weekly," was issued from the Adams side of the office. Later, somehow becoming much taken with the new "Broadway Weekly," we changed the name to "United States Memorial," Memorial being the name of our particular village street. Many of the Memorial's features were taken directly from the Journal, but on the whole it was obviously a product of the serious Adams mind, using the "Outlook" as a model. Each week there was an impartial review of leading events, and sundry sharp editorial notes of economic or political import. It was so well written, indeed, that an amiable and highly educated woman at a nearby sanitarium became much interested and rewarded us generous praise as well as the cash subscription price of two cents per copy. But the Memorial, like so many of its predecessors, was doomed to a short life, and with its passing the Day & Adams Publishing Company was automatically dissolved.

My most interested journalistic contemporary was Robert Brooker, who began, wholly under my guidance, to print a small weekly known as the "B— Star." Brooker proved a willing imitator, and I easily led him to occupy my Office jointly with me. The Star soon changed its name to the less prosaic "Comical Sayings," but even this did not please Brooker, and though his paper lived less than three months it came out also under the titles of "United States Record," "Brooker's Weekly" and "Brooker's Semi-Monthly." The contents of all these, however, were fairly uniform, including a few brief news items, colored pictures, and an abundance of jokes; there was little or no original material, for the jokes all came from the daily newspapers and my Journal supplied practically everything else. In fact, the average

Brooker's Semi-Monthly, under whatever name, was scarcely more than a revised United States Journal, and in one or two numbers there actually appeared some of my own printing and drawing. So very comprehensive was Brooker's imitation that he even delivered his paper to a next-door aunt, exactly as I did. But there was no ill-feeling on my part, for I was highly pleased to have a protégé and I was willing to go to any reasonable extreme to maintain his interest in printing. At no time did Brooker become a through-and-through journalist, yet I found immense comfort in his "professional" sympathy, and his respectful, unquestioning imitation was not a little flattering. Brooker and I, though working so much together in the same room, never formed a regular partnership. We looked upon one another as friendly competitors, though of course our papers did not really compete. Yet his parallel labors furnished me a valuable stimulus, and it is certain that during this last printing friendship the United States Journal (except possibly for the Christmas Annuals) reached its highest development.

II

The files of the United States Journal and the earlier papers, comprising in all about eight hundred separate issues, supplemented by a considerable number of school exercises, diaries and boyish "memo" books, altogether furnish an unusually complete record of childhood development. Every drawing, every news item, every story, every "feature" reveals in some way the fine inter-workings of the psychological trinity of heredity, past experience and present influence. There is scarcely a change from within or without which is not directly or indirectly recorded in the columns of the Journal or the supplementary papers and writings. Besides the more specialized developments of play, nature love, sex love, religion, and the like (which may be treated in detail in later articles) four very clearly marked stages of boyhood development may be distinguished. First, we have the early stage in which the papers report news concerning only the Editor himself or his most immediate interests; second, there is the stage in which he becomes much interested in family and domestic affairs; third, there is the stage of neighborly community interest; and, finally, there is a stage of broad social and political interests, accompanied by moral and altruistic tendencies which are reflected in "preaching" editorials or school themes and stories. After this, coming well into the adolescent period, we find a prolonged stage of criticism in which the youthful Editor is simultaneously and impartially critical of self,

family, neighbors and world. Here we find the Journal publishing, on one hand, introspective essays on adolescent thoughts and feelings, and, on the other, satirical editorials, special articles and cartoons.

The editorial career seems to have begun a little prematurely, in a way, for the entire lack of news, even about the Editor himself, in the first papers indicates that he had yet to develop a personal conscience sufficiently strong to give itself expression in written or printed language. But this dumb impersonal stage was of brief duration and long before the Editor could successfully compose a sentence alone he began to print news about himself, having prevailed upon his older sister to print out short items for him to copy. Some of her contributions, such as those about weddings and funerals, were rather too broadly social for him to appreciate, though as a rule she followed his instructions to the letter:

C— Day walked up to the greenhouse of Mr. Holmes, with his papa, Brownie [dog], and Mr. Hunter Feb. 27, 18—.

Mr. Olney Killed a Large Rat in th Pantry Yesterday Morning? Sept. 26, 18—.

C— Day weighs 50 pounds ne weighed himself Dec. 2, 18— in the Evening.

We went to call on Minnie and the new Babt [baby]. C— thought the baby was quite a sight.

C— is a good boy.

Names other than mine are at times common, but they serve only as means to an end. The important point about the greenhouse walk is that C— went; that the others followed is purely incidental; the killing of the Large Rat is momentous chiefly because it disturbed C—'s usual home routine; and the interest in the new Babt is not so much the baby itself as it was what C— thought about it.

It was not long after I gained a certain amount of independent spelling and grammatical ability that I turned rather strongly toward family and home affairs. Day after day the Journal filled its columns with news of this sort:

WE HAVE A NEW GRIL [GIRL]

Jan. 17—We got a new Gril to-do the Work? Mama was Sick When We got Her.

THE GRIPPE

January 18—My Mama As the Grippe My mama to my mama [grandmother] as the Grip But I have had it 2 times One Last Year and one Time 18—.

Nov. 26—Ma pa me Clarence and Uncle Gilbert All went to ride.

We do not know whether Grace will have the Measles or not.

Household management opened up a new field of boyish activity. My tastes were already becoming strongly domestic,

but Mrs. Kiley, a stout jolly Irishwoman and one of a series of new Grils, put the kitchen in such a favorable light that for a time I found it a real pleasure to get up early and help build the fire, and I came to fill the woodbox frequently even without asking. I became adept in preparing breakfast food and cocoa. Homely jingles about Monday being washday and Tuesday ironing-day could not fail to entertain me. The Journal ran a series of colored cartoons, half-serious, illustrating daily home life in Rubbernecktown. I was particularly well posted as to the items making for a thoroughly equipped pantry, being able off-hand to recommend the best brands of canned goods, spices, and so on, while I had various passing favorites in the way of flour, cereals and extracts. Though occasionally I published copied recipes, my domesticity burst forth from the Journal's columns chiefly in the form of advertisements:

ROYAL BAKING POWDER

Royal Baking Powder is the very best and PUREST Powder ever made. No other is so good. We give full measures. Sold by all grocierie men that know anything. Give a friend a box for Xmas for their cooking. There [are] half lb. boxes & Lb. boxes.

"PRESTO!"

Ten Cents a package. It will make the Best "Flap-Jacks" and "Griddle Cakes" you ever thought of tasting.

FORCE

The new and BEST breakfast Food. It is a nice flaky food. It will help make your Xmas Breakfast GOOD. What the Editor of this paper says:

Sir: I think "FORCE" is the very Best breakfast food I ever tasted and eat for nearly every breakfast time.

[Signature] C— Day. Editor and prop. U. S. Journal Co.

FORCE CO. Buffalo, N. Y.,

Force is for sale by: F. L. Nolton, Grocier. B— Mass.

The rare visits of painter, paper-hanger and plumber became seasons of special enjoyment, and to see the smiling, friendly doctor, with his mysterious black case, was well worth a cold or unhappy stomach. The "hired man," by very simple magic, in which circus yarns played an important part, easily aroused my interest in horses, lawnmowers and garden tools. A boy in the full flush of the family stage is a true country gentleman, with a keen eye to both kitchen and stable.

I had of course always followed my parents about more or less as they called upon their friends, but presently, at ten, I began to make calls all by myself. In perfect neighborly style I would step in at the door without knocking, reluctantly sit down, comment seriously upon the weather, and even venture a timid word or two upon the political situation—

always as a Republican. Then I would uneasily seek out the Sunday comic supplement or the latest illustrated magazine and relapse into silence, until perhaps some candy or pop-corn appeared, whereupon I referred again to the weather, praised the wit of the comic artist and perhaps mentioned a few latest happenings about village. I had learned my lesson well and was in a fair way to become a model neighbor myself. The Editor came to delight in visits, colds and innocent scandals:

Eva Smith is the only one who wore her Easter hat Sunday.

F. L. Nolton and Lewis Freeland each had their grocery wagons painted.

Apr. 5.—Willie Locke is building a hen house and will start with 12 hens.

Oct. 13.—Mr. Ladd was in town and went home on the 2 o'clock train. Little Harry Seton is on the sick list.

Mr. Locke had a load of wood on the afternoon of Oct. 12.

Boy-hating neighbors of course took no more notice of me than ever, but those like Mr. Hunter, who was always interested in my garden, and Mr. Rollins, who gave me a stamp album, fully realized my growing importance and they returned many of my kindly attentions. If Mr. Hunter called at my house of an evening he often inquired for me, and remarked pleasantly on my rapid growth, my reported success at school, and paid me very marked attention withal. He began to take special notice of me on the street. I was no longer merely "one of the boys." I was now called out by my first name, and either Mr. Hunter or Mr. Rollins might stop to speak with me as I played on the sidewalk, much to the awe of younger fellows who could not as yet appreciate the meaning of true neighborliness.

In the narrow sense of next-door neighborliness the period of neighborhood interests was short, but in its broader community sense it persisted for several years, and the family fell into the background unless some member chanced to do something of community significance. The gossiping small boy was at his best at the age of nine, but the growth of a wide community interest was so gradual that it did not mature until three years later when the world interest had already become strong. The first dim visions of a world of men and action came through sundry social myths and traditions that were handed down to me by parents, teachers and older associates. I somehow missed Santa Claus, but I became well versed on Lincoln, Washington, Thanksgiving, and the national traditions in general. Each year, through drawings, decorations and detailed textual explanations, Journal readers were reminded of Kentucky log cabins, Crossing the Delaware,

the Declaration of Independence and the Coming of the Pilgrims. From a special Washington Birthday Number I quote:

. . . The only Joke on him was he cut down his father's cherry tree. People say that he never told a lie. He died of a cold.

ABOUT THE TREE

When his father see the cherry tree cut he went to his children and asked them who cut the tree down and when he came to George he asked him and George said, Father, [I] did it with my little hatchet and his father did not whip him because he did not tell a lie.

I had always followed the daily paper, yet it was not until I was ten that I really became at all interested in the world's news. At the time of the Cuban war the startling headlines and pictures attracted me considerably, but the attraction was due to the headlines themselves rather than to any genuine appreciation of the war or what it meant. I had heard that several townsmen had "enlisted" and "gone to the front," a place which seemed to be a long way from home, but I did not associate my townsmen particularly with the events so vividly spread over the first pages of the Extras. When the Boer and Boxer conflicts were at their height, however, my mind was more alert, and I began to realize the meaning of war. I watched the news closely and reported many of the greater battles to Journal readers.

This first contact with the outer world is marked in the Journal chiefly by the appearance of much so-called Make-Believe News. Arrived at the warrior age, with my active boyish imagination, I endeavored to create a world of my own. Instead of common-place real battles, the front page often announced sanguinary imaginary struggles in which I, always as General, led my troops to glorious victory. A Saturday afternoon skirmish with wooden guns and cracker-filled "knapsacks" gave rise to Sunday morning scareheads about dead soldiers and wrecked battleships, and a quiet hour at my desk resulted in royal diplomatic parleys between the kings and emperors of my imaginary world. (See author's "Child God," *Ped. Sem.* 1914, vol. 21, p. 309-320).

At length, confining my Make-Believe activities to mere day-dreaming, I began to take the world more as it was; and as I did so I passed from War to Tragedy. I was fascinated by murders and robberies, train wrecks, fires and tornadoes. About town even I was continually on the watch for the latest sensation. Our postmaster was likewise newsdealer, and each day I peered through the glass-faced postoffice boxes for a glimpse of the evening scare-heads; with a burning penny in hand it was only a toss-up between a lollypop and a red-lettered Extra. I became an Authority on the current murder trial, and my opinions of guilt or innocence were respectfully

tolerated by grown-ups. A local sensation was a wonderful event. If a store on Main Street were robbed of a few cigars and a dollar or two in cash, I carefully investigated the scene of the crime next morning, the while looking upon the unfortunate storekeeper with great awe and veneration. A fire was a mixture of shivers and thrills. As I listened, counting the whistle-blasts, my teeth chattered for fear the blaze might be near home, yet I was much elated at the prospect of rare excitement and destruction. The town was too small for murders and suicides, but cut fingers and sunstrokes served the purpose just as well, and for weeks after the victim's recovery I stared at him whenever we met on the street as a kind of hero, a man who had gone through an enviable experience through which few men were privileged to go.

During this tragic period the Journal inevitably became yellowish in tone. My presentation of news was decidedly sensational, and whether I treated of a cat's death or a man's my headlines were equally large. Even the commonplaces of household and neighborhood gossip became infected with hysterical journalism:

LOST IS FOUND!

But is Dead.—Lost Last
November.

April 15.—Last November we lost a kitten and found it in the water-pipe that goes out into the henyard dead. . . . It was a kitten. . . . its name was Snipce.

LOTS OF BIRTHDAYS!

All in the Town
of Templeford
Today. . . .

BAD LUCK.

But has started again.

April 3.—Clarence Day has got 8 chickekings hatch out of 52 eggs,

CHICKEN POX.

David Fisher one of the Journal's head men has chicken pox.

The leading headlines were at times two inches or more high, making them decidedly conspicuous on the Journal's modest five by eight sheets, and the news itself was often written in a dashing breathless style, much to the discomposure of polite spelling and grammar. Though the Journal Office was quite isolated from telegraph or telephone, the Editor showed no hesitancy in publishing many Latest Bulletins and Special Despatches.

I had been an editor nearly six years before I wrote an editorial. The Journal Editorial Page, which was a regular fixture almost from the beginning, was profuse with subscription rates and office regulations, but it was lacking in

editorials until I was ten, at the same time I became appreciative of the larger world. The first editorial comment, appearing under the head of "Chatterbox," was a curious mixture of personal, neighborly and worldly observations: one Chatterbox speaks of the January thaw, Queen Victoria's death, and my own recent purchase of a bottle of mucilage. But politics was soon to brush aside self, family and neighbors, and following a certain critical State fall campaign, editorial comment became thoroughly and permanently worldly in tone. Directly after the election I was stirred to write:

The REPUBLICANS are O. K.

Gaston [defeated candidate] to Bates; After you my dear Alphonse. Gaston was too polite.

Poor democrats!

Politics, though of course on a higher plane than pure sensational tragedy, is scarcely less exciting. For the small boy there are thrills a-plenty in local elections and town-meetings; and if he keeps himself posted at all (as he must as a budding man-of-the-world) he can find no mean stimulation in the wild pre-election prophecies and straw-votes, the partisan bitterness, the Wall Street odds, the occasional "landslides" and all such phenomena. And, as he grows older and takes the interests of his Party at heart, as I did, he will come to feel an interest even in calm discussions of presidential timber and tariff prosperity.

It was at this time I became acquainted with the serious-minded Bernard Adams, later editor of the United States Memorial and junior partner of the Day and Adams Publishing Company, who was such an influence in making the Journal a "clean," conservative newspaper. My social conscience, like my paper, was ripe for a change, and Adams' preachments on social and economic evils I took over bodily, so that I worried a great deal about the Saloon, stock-gambling, and the sundry problems of capital and labor. In common with many wiser heads I believed the world was going to the bad, and that there was no hope for it, and what was there to be done about it? My editorials, now deservedly so-called, became downright pessimistic:

Where are the people of New England coming to? . . . There are so many murders and fires set to destroy property. . . .

. . . His cruel mess . . . of bull speculators, are still rising up the price of cotton so that the poor people will be unable to buy it for clothing. As long as they make money raising the prices of cotton and getting more money out of the poor people's pockets they don't care the least bit.

In this city . . . many divorces are being wanted by society people. They also gamble on the large scale and drink strong liquors and wine.

Many great people are dishonest, especially a great many office holders.

Closely allied with this pessimistic trend, we find a characteristic adolescent tendency to preach and moralize:

Whiskey drunkenness will often lead to death or serious injuries, and leave a family in a bad way. A person that drinks liquor is as bad as a wild animal. A person should know enough to leave it alone. "Down with HORRIBLE liquor."

Be economical. Don't spend too much money on clothes, candy or other unnecessary articles. Save your pennies, for the[y] make dimes, save them, for they will turn to dollars. And doolars, when young, make you happy and comfortable in old age. . . . If you spend money lavishly when old you'll be unhappy and in debt. Then you can't live in your own home, and will be sent to the poor house in debt. WHICH HAD THE YOUNG MAN AND WOMAN OF TO-DAY [RATHER] DO?

Much of the Journal's fiction reflects a similar moral attitude. In one story, for instance, after years of hard work and careful saving, accompanied all the while by brotherly and sisterly derision, James Bolton, the hero,

. . . retired, a man of \$500,000 in his money room. He then [was] elected governor and kept office until his death, and left his two children a fortune. His brother and sister were also surprised. THE END. MORAL. "Be economical when young; live happy when old."

Yet not infrequently sheer selfishness came to the fore, and in some adventurous tale of the Alger or Oliver Optic type I easily doled out riches and happiness as rewards for mere physical hardship or hairbreadth escape. A serial, "Adventures Among the Andes Highlands," is characteristic; after the customary suffering at the hands of bloodthirsty Natives and a treacherous nature,

. . . They came upon some glittering bricks of gold and silver.

CHAPTER 4

This they gladly grabbed, put it into every pocket. They ate a mouthful of food and put the bricks in their napsacks. They then walked nearly half a mile when they came to the cave's end, and there below them appeared the city of Quito! They ran down to the wharves, boarded a steamer for San Francisco. They got here in a short time, sold their gold (except two bricks) for a million dollars. (\$500,000 for each). They soon married in New Orleans and now own a home, stock office, and also have a fortune and children.

THE END OF JACK BERGINTON AND E. HERRSFORD.

My concern about bull speculators, divorces, drink, and the like persisted only a few months. Pessimism is not a natural youthful state for long, and due both to changes within and

the entrance of more optimistic schoolmates into my environment I came to see that there were a few good things in the world after all. The holiday dinners of the Salvation Army, the adoption of a gold money standard in Mexico, and the Panama Canal were all topics of interested news or editorial treatment. My comment, aside from the inevitable political bias, denotes a broad and hopeful outlook:

We hope that the forming of the new Republic of Panama will result into having the isthmus be a land belonging to the United States. . . . This will give us a chance of building the canal at once. . . . Commerce can be done much cheaper and quicker. . . . In time it will save millions of dollars . . . so that the canal will be practically cheap.

The election of the past week shows the spirit of the American people. They want the best man for president. . . . By this they elected Theodore Roosevelt. . . . They knew he was the best man.

United States should have a larger and stronger navy at once. Nearly every important nation has a navy stronger than ours. Should there be a war . . . the cost of new battleships would be much less than the loss of a poor navy would come to.

At about fourteen the boy enters upon a new era in the development of his social conscience—an era of, as it were, Critical Synthesis. Before this age he has been passing down the gauntlet from Self to World, receiving as he goes occasional ideas and opinions which he absorbs in a wholly imitative, echoing sort of way; but now he must set about to reconstruct, to criticise, to synthesise. His earlier experience, up to this time more or less confused, slowly merges to form a consistent whole, and the new youth begins to talk vaguely about his "philosophy of life," or "creed," or "religion," or whatever he may please to call it. He evinces certain definite interests. He adopts an attitude. And, sooner or later, forced by the urgent, boastful inner man, he comes to feel that he must impress his views upon the world. Sometimes his views are not well received, it is true, but that matters little (save to jar a few tender feelings), for to him the all-important thing is self-expression. Nothing so enhances the synthetic process as to give the new, half-formed opinions an airing in speech or script.

Like all adolescents, I had a considerable variety of scientific interests, but affecting my social conscience most directly was perhaps the peculiar trinity of weather, hygiene and forestry. After keeping careful local weather records for several years and studying two or three convenient physical geography texts, and then becoming suddenly struck with the current false notions, especially among grown-ups, I attempted in a modest way to set things aright. My sister I completely converted; my father was open-minded, but apparently not convinced; other people, such as my aunt Nancy, who had been

brought up to believe in almanacs and sky-signs, were quite untouched by my vague discourses on "lows" and "highs," isobars and isotherms, unchanging seasons, and the like. The Journal occasionally presented short articles on weather topics, always emphasizing the scientific view, and reminding the reader of his probable stock of fallacies. Typical of this weather hobby is a school essay on "The Innocent Month of March," in which I prove, to my own satisfaction at least, upon a basis of three years' observations, that March is really much maligned, for "statistics prove the month to be generally calm, quite sunny, and a month of comparatively light rain and snowfall."

Having read one or two simple books on physiology and numerous popular "health" articles, I considered myself well-fitted to advise on matters of diet, ventilation and disease. I cherished many heretical doctrines, supposedly more or less unique, some of which I ventured to impress upon my elders. Never eat between meals, never be sick. Sit deliberately in draughts, be free from colds. Dry, steam-heated rooms are a direct invitation to death. Rain and dampness are absolutely harmless. Rheumatism is *simply* uric acid. In a school essay "Concerning the Air in the Classrooms" I fearlessly "muck-rake" the school officials for their sanction of ill-ventilated classrooms, and then proceed to enlighten them, with doubtful accuracy, on the function of oxygen and the blood in their relation to heart, lungs, and mental work.

Both in school papers and Journal editorials I became a staunch friend of the tree and forest conservation. Brush-fires and the annual Christmas-tree slaughter were my favorite themes. The great American Public was urged to watch out for its own welfare and the needs of posterity; for the sake of the Nation's future I pleaded with my readers to dispense with Christmas-trees, calling attention to the fact that nowadays we have good imitation trees which will please most children, and that perhaps the old fashion of "hanging the stocking" was the best way of celebrating, anyway.

These articles of scientific import were for the most part about things in general, and so far as they were critical, they were directed toward people in general. We find, however, that most criticisms of this adolescent period have a more personal reference. I was, perhaps, first of all self-critical, weighing carefully my own strengths and weaknesses, my abilities and shortcomings, contenting myself generally that my strengths and abilities were well in the ascendancy, despite occasional unhappy circumstances which led me at times to write very gloomy diary entries. The only marked failing that I saw fit to confess to the world was forgetfulness. Just

why I was so frank about this is uncertain, unless it was because I sometimes referred to my inborn forgetfulness as a reason for my aversion to certain dull, memory-drilling high school subjects. My most complete confession is embodied in a long essay on the "Trials of a Forgetful Boy." Very thinly disguised as "You," the Editor shows himself working in the garden-patch of a fine May morning, much handicapped by absent-mindedness and spring daydreaming. The short distance from garden to toolhouse is quite long enough to allow him to forget the hoe that he wants; it is utterly impossible to remember more than two items of a list of five on an errand that may be accomplished within three minutes; the call of the dinner whistle is the only force that can keep his mind on a straight track for any considerable period.

I was likewise family-critical, seeing in adolescence for the first time the serious human fallibilities as well as the heroic attributes of my relatives. It was at home, especially, that I became deeply susceptible to the jars and jolts of social contact. No where else did I seem to be so hindered by cross-purposes and conventions. My Editorial desk seemed always to be in the way of the merciless Household Machine. One paper, on "Exasperating Neatness," deals at length upon the evil of the morning dusting, an institution which appears to have been established particularly to keep the Editor's desk and bookcase in a perpetual state of confused arrangement. Protests of every kind were finding their way into script or print, as I met with some new reproof or was advised of some new convention. "Why Some Boys Enjoy Being Alone Occasionally" treats chiefly of "Bobby's" troubles with soiled neckties, table manners, unblackened shoes and bespotted clothes. "A Day With Jimmy" concerns one day's troubles of the average schoolboy, with oversleep, unhappy lessons, broken windows, and so on; while the sad lot of the boy during visits and week-end gatherings is duly bemoaned in "There's Going to be Company at Our House." Once or twice, even, the Journal was forced to cut down its size because of household turmoil. A very thin four-page April Journal contains this notice:

THE REASON this week's Journal is so small . . . is that the editorial rooms are so disturbed and upset by the advent of spring housecleaning that it's nearly impossible to find a place to do the printing of the paper, to say nothing of trying to get together thots in the turmoil to think of any news. Spring is a fine season, but the poet who wrote of "beautiful spring" never had to undergo the tortures of the annual feminine spring housecleaning.

Bridge whist chanced to strike my community while I was in the middle of the high school course. Evening was my

favorite as well as most convenient time of study, and anything that interrupted me seriously immediately fell into ill grace. My home room was near enough the parlor so that when bridge whist nights came there was no getting French or German, if the need were never so desperate. An article appearing in one of the later Christmas Numbers explains the situation. The Craze is alleged to have instituted a "perfect reign of terror" for the innocent bystanding student, while the suffering sleeper is led to wish all sorts of dire calamities, like death and long journeys, upon the heads of his erstwhile friends. Mealtimes, too, are under the curse, for last evening's game, or the Rules, or plans for another party so occupy the general attention that a mere youth must go quite neglected when it comes to having things passed him, or getting his due proportion and balance of food and drink. It is the writer's parting wish "that since bridge whist seems to be a winter game, the present winter will be unusually short."

Then, again, at adolescence, I became neighbor-critical, taking more and more to heart the faults of my townsmen and the evils of the town. I had of course long been a gossip, but I had gossiped only as would a phonograph, for I had no very deep malice toward anyone personally, and there were few or no delicious little scandals that I had ever witnessed firsthand. Even the larger notorious town evils, as bad roads and rickety bridges, I had taken mostly second or third hand, rarely going out for myself to the case in point. Now, however, as I came socially more and more into competition with other young people, and called upon my neighbor as a sympathetic social being (rather than as a naïve young fortune-hunter in search of comics and candy), and strolled about town for a morning walk, I found marks for criticism upon every side.

I had a special antipathy for the Noisy Boy, having in mind probably a certain younger schoolmate who often proved a jarring element in my experience. His fullest treatment is in a school paper which takes for its text Poor Richard's "The worst wheel in the wagon makes the most noise." Pious young people, who attended social functions at the church next door, were also objects of criticism. An essay on "Incidents of a Church Supper" gives in detail a few of their noisy and neighbor-vexing pranks, such as leap-frogging over chairs in the vestry, tattoos played on the metal ventilator shafts, and general ill-treatment of the neighbor's lawn and garden. The writer is much comforted as he reflects, at the conclusion, that "these suppers come but once a month."

My neighbors, like all sober grown-ups who have settled down in life, were of course much given to social conventions

and the use of stereotyped rhetoric, so I, now a fresh new youth, with little respect for age and quite thoughtless of my own stereotyped future, took it upon myself to call attention to this human frailty. In such articles as "A Social Call on Your Neighbors" and "Mr. and Mrs. Jones Now Have a Furnace," my neighbor and his wife were both satirized for their excessively habitual conduct whenever I called and their unoriginal way of saying and doing things generally. A paper on "Stereotype Phrases—Do You Use Them?" considered particularly the matter of commonplace greetings and exclamations. But my neighbor's stupidity affected me most vitally when it chanced to intrude itself upon my work, especially my outdoor work upon the front lawn, where I was freely exposed to the view of passers-by. The "One Disadvantage of Working," as expressed in a long theme appearing under that title, is the answering of "an endless string of nonsensical questions" that your friends and neighbors inevitably put to you if they by chance catch you hard at work. Each assails you with sundry happy and ancient remarks on the state of weather or season, or diligently inquires "if you are working hard," or sarcastically exhorts you "not to hurt yourself."

Such little personal concerns bothered me considerably, as they do all adolescents, yet in the field of news interests—as embodied in the later Journals—petty gossip gave way largely to affairs of general community importance. I became enthusiastic about village improvement, town politics, and the larger small-town social events, as amateur theatricals, school receptions, baseball games, and band concerts. That Miss Smith was the only one to wear an Easter hat, or that Mr. Locke had a new load of wood no doubt continued to interest me (as a true villager), but these larger things interested me more. In editorial and special news "write-up" I mildly implicated the selectmen for their part in certain mysterious road-money expenditures and bridge-painting contracts, while the citizens generally were criticised for our sidewalkless streets, our inferior public buildings and the several ancient community eyesores. Nor did this broadened local appreciation mean that I cared for the world less than heretofore; instead, the world had become my standard and I would raise the town to its level. I began to realize, as I had never realized before, the many discrepancies and incongruities which our little village must display to the stranger, and I was in the midst of that particular period of youth in which familiarity breeds contempt rather than sentiment. Editorial comment of this type is characteristic of the time:

THIS WEEK'S "Alton Chronicle" states that the local hotel has been abandoned and the yard has been used for a horse pasture. This is true, but not only that, but the common, too, is used for that purpose. It may be healthy for young colts to run over the expanse of the common, but it is not especially beautiful or beneficial to the village's appearance.

. . . Puzzle:—If it takes the P. & N. 14 hours to clear 2 tracks from a slightly smashed snowplow and derailed engine, with two wrecking crews, how long would it take the same road to clear up a truly serious collision or freight wreck?

THE EXPECTED HAPPENS

As people all expected, the cars on the Tiltham Street Railway did not run yesterday on account of the stupendous snowfall of three or four inches. One unexpected thing did happen, however—the town had the sidewalks cleared shortly after noon.

Finally, I was world-critical. For some years, to be sure, I had been more or less critical of world morals and politics, but my attitude had been almost wholly imitative and impersonal. In this later stage, however, I began to see the world more in its relation to myself, as something very real which would sooner or later, as I entered upon active life, concern me very intimately. But this higher stage of criticism was only beginning when I was eighteen and so does not properly come within the present study.

There is no convenient escape from infancy, childhood or youth. They are planned from the beginning. But just what course they shall take is very largely determined by the social group. Nature is responsible for getting the youth to manhood, but nurture is responsible for the way in which he meets it, and what he does after getting there.

My father argued Republicanism and I at once became Republican. A friend decried yellow journalism and I at once became conservative in my newspaper management. My grandmother pondered much over the spiritualistic significance of dreams. I became interested in dreams. So it was with every early-life influence. Yet I became something more than a mere echo of my environment. My Republicanism was not exactly like my father's. I was not half so conservative as my friend, and my dream ponderings soon became scientific instead of spiritualistic. My small germ of "original nature" and my gradual accumulation of experience combined to modify each imitation into a half-original creation. Thus at eighteen I had a peculiar Republican bias, a preference for moderately conservative newspapers and a strong interest in dreams.

Parents appear sometimes to depend entirely upon heredity to bring out in the child certain social qualities which may have existed in the family. In some mysterious way the boy

will evolve from within a taste for manufacturing furniture, or the Methodist creed, or the family snobbishness; but it often happens that the youth, even upon the edge of manhood, has developed no marked furniture propensities, that his creed simply is not, and that he is absurdly democratic in his habits. A parent does not mold a child's character merely because he is parent; only as he sets actively about character-building does he achieve anything. The youth's mental background analyzed reveals few acquisitions from the passive people of the fireside, and his viewpoint is frequently that of an uncle, or someone entirely without the family circle. The strenuous crusader leaves a much greater impress than the shining example.

Even my most positive social companions made no special effort to direct my course, and thus I was left easy prey to impersonal influences in the form chiefly of newspapers and magazines. A majority of my tastes and interests seem to have been molded by reading. Printing of course was the most obvious outgrowth of this impersonal influence, while less directly evolved would be certain later interests in history, literature and science. So far as positive influence goes, school seems to have been one of the lesser incidents of my boyhood. Perhaps on one hand there were too many shining examples, on the other, perhaps there was too limited an opportunity for self-expression. Certainly school failed to make a very deep impression upon my editorial self; only in a few rare instances do "number work" and vertical script intrude upon the news columns of the early Journals, whereas the irrepressible Editor printed school exercises whenever he dared, and spent many school hours printing and drawing on waste sheets of paper. My editorial diction swayed between school models and home models, but the latter invariably won out. I may have had a particular school stent in mind when I chose to write an inanimate autobiography of a thermometer for the Journal, though with the first sentence I was talking Alger and Optic. Nor are my Brisbane editorials of the sensational era, my Dooley philosophies (Uncle Hiram), or my Shute's Real Diary mis-spellings (Jimmy's Letter) strongly suggestive of the school curriculum. School and teachers furnished me somewhat in ornament and technic, but editors and newspapers furnished me with ideas. The newspapers had the advantage of first impression, yet it seems that the elaborate mechanism of school should have been more influential than it actually was.

The boy himself is an important part of his environment. He is not entirely helpless, and his own creations have much to do with his social development. The Journal was certainly

a fact of first importance in my environment. In one respect its influence was strongly conservative, for the old files kept me in close contact with my own past, and the glamor of sentimental association kept me looking backward. Otherwise the paper was an agent of progress. Several hundred words' composition each issue was no mean rhetorical training, drawing and printing developed artistic interests, systematic arrangement and regular publication made for discipline, while past achievement ever stirred to emulation. Rivalry with one's own past is a fine stimulus to personal progressivism; and my own past self, with all its perfections and imperfections was continually mirrored back to me in the old copies of the United States Journal.

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THE SPEECH DEVELOPMENT OF A CHILD FROM EIGHTEEN MONTHS TO SIX YEARS

By MARGARET MORSE NICE, Norman, Oklahoma

In 1915 I published a paper on the speech development of my eldest child from eighteen months to four years. Since then I have collected her five and six year vocabularies. In the present paper her vocabularies are given at nine ages—14, 15, 16, 17 and 18 months, and three, four, five and six years. The eighteen month and three and four year vocabularies are repeated for several reasons. First, the five and six year vocabularies are simply added to the earlier ones, with the forgotten words indicated; so there is no repetition. Second, in my other paper I included proper nouns; in this they are omitted in all the vocabularies to bring them into line with what appears to be the best method of recording vocabularies. Finally, the child's development from year to year is shown.

E. is the eldest of three children. Her ancestry is Scotch-Irish, German and English on her father's side and Scotch-Irish and English on her mother's; she is in the fifth to the eighth generation in this country. Her father is a teacher of physiology in a medical school; her mother is a biologist. Her health has always been excellent; her height is slightly above the average, her weight slightly below. She is an active child, loving to walk in the woods and being an expert tree climber. From babyhood her greatest interest has been in nature, in flowers and especially all kinds of animals. She has a logical mind and inquires to the bottom of things; yet at times she has been decidedly imaginative. In the Binet test at three and a half years she tested four and two fifths; at six years she tested eight and one fifth. She is an original child and very little imitative. This last characteristic has its disadvantage in making it a slow process to correct her mistakes in English, but on the other hand she does not pick up slang, incorrect grammar or objectionable phrases from playmates or chance associates. She seldom uses a word unless she is sure of its meaning. She is not a talkative child and this of course makes it impossible to get her full vocabulary.

The Learning of Language. We have not tried to teach

our children to talk by telling them over and over again the simple words they are supposed to master first. E. went through no "parrot stage," never repeating words after her parents. She never merely imitated words but used them when she needed them. Apparently she did not begin to talk until she knew what her words meant; she never called men in general "Papa," nor animals any but their proper names, as some babies do.

She walked at thirteen months so that was all accomplished before she began to talk.

Her vocabularies for the first four months follow.

(T.W. means Total Words, N.W. means New Words.)

14 months. T.W.=3. Mamma, Papa. Bow-wow.

15 months. N.W.=1, T.W.=4. Bah.

16 months. N.W.=9, T.W.=13. Book, bird, Bobby (a doll), bread. Moo, r'r, umph. See. No.

17 months. N.W.=33, T.W.=46. Baby, boy, butterfly, car, card, choo-choo, Danny (a dog), ear, eye, Harold, hat, man, milk, monkey, moon, mouth, nose, Pye (original name for a doll), tail. Caw, cock-a doodle-doo, gobble, myow, quack. Cold, cunning, funny, poor, pretty. Please. Good-by, good-morning, goodnight.

Common nouns, 31. Proper nouns, 4. Verb, 1. Adverbs, 2. Adjectives, 5. Interjections, 3.

The appearance of the different parts of speech were as follows: nouns at 14 months, verbs and adverbs at 16 months, interjections and adjectives at 17 months, pronouns at 22 months; prepositions and conjunctions shortly after she was two. She said "No" at 16 months and "Yes" at 20.

We always spoke to her as "you," and of her by her name, yet she used her own name very little, probably because it was hard to pronounce. She called herself "Baby" exclusively from 17 months to 22 months when she learned the personal pronouns, "my," "I," and "you." She used both "Baby" and "I" until she was past two years. The time from the first use of "Baby" to that of using "I" was five months. Sentences of two words were first used at 19 months; the time therefore between the appearance of the first word and first sentence was five months.

Her Environments. E. has had a number of changes of residence. At 18 months she lived on the outskirts of Cambridge, Massachusetts; at three she lived near the center of Cambridge; since then her home has been in Norman, Oklahoma, while her summers are spent in the country near Amherst, Massachusetts. She has always had a fair amount of child companionship. From the age of three and a half to four and again from four and a half to five, she had the benefit of a little Montessori Nature Study Class meeting at her home in the morning. She has not been to a kindergarten,

nor had she received any formal education except that for about two months before she was six I started to teach her to read. She has heard a good deal of poetry, the best of the fairy stories, Kipling's "Jungle Books," the "Younger Edda," and much more literature adapted to her age. The most vital influence in her life has been nature—animals and flowers in Oklahoma and Massachusetts. She has had as pets, frogs, gold fish, pollywogs, rabbits, hens, chickens, turtles, horned toads, lizards, salamanders, snails, caterpillars, crawfish, toads, snakes, a puppy and a young robin.

The Vocabularies. The 18 month vocabulary was obtained by keeping a record of all the words used up to that time. The three year vocabulary was taken for one month before the child's birthday. The four year vocabulary was collected for three months before her fourth birthday, the first two in order to get words used in Oklahoma and traveling which she doubtless would not have forgotten, but not have had opportunity to use in Massachusetts. The five and six year vocabularies were taken entirely in Massachusetts for one month before and one month after her birthday. It seems to me impossible to get a full vocabulary of children over three unless they happen to be very talkative, for they know so many words that they do not have occasion to use during the time under observation. E. talks less in the summer, when I collect her vocabulary, than at any other time, for being with many people she spends most of her time listening, especially as her almost constant companion is a decidedly loquacious boy cousin a year older than she. She was asked directly what certain things were, but this method was used only in trying to get former words repeated. Some of these former words were elicited by conversation, but not very many, for she resents apparent attempts to probe her intelligence. The words were recorded from her conversations; at no time when I have taken her vocabulary has she engaged in much of any imaginative play. If she had done so, her vocabularies would doubtless have been larger but probably less exact. Now, at six and a half, she plays a great deal with toy animals, having them experience most exciting adventures; she, meantime, using a large vocabulary, much of it new, but some of it apparently used imitatively without the meaning being known as clearly as when she employs words in conversation.

At no time has she had any idea that her words were being recorded. She is used to seeing me write at all times and when we were outdoors and she asked me what I was writing, I told her what was perfectly true, that I was putting down the names of the flowers and birds we were seeing. I would rather not have my children know they were under observa-

tion; there would be danger of making them conscious. E. would probably have talked less if she had known it; D. our second daughter might have talked more.

Pelsma ('10), Boyd ('14), and Bateman ('14, '15, '16), seem to have adapted the method of elimination that is fairest all around and that is most adaptable to different ages. I will quote Bateman's ('16) rules here.

"1, no proper nouns; 2, no plurals unless the singulars were not used; 3, all forms of pronouns are included; 4, no variants of verbs or adjectives unless sometimes from different roots; 5, the same word may be listed more than once according to its grammatical use by the child."

Boyd ('14) in his study of his daughter's speech development made a suggestive classification of his child's nouns into fourteen divisions according to interests. Using Boyd's work as a basis, I combined several of his classes and grouped them all into four main divisions, adding one—words from pictures and stories—so as to show the sources of her words. It is sometimes a little difficult to decide where words should go; the method I used was this. A word is put into that division where the child first used it or is most vividly impressed with it; for instance, to E. as a baby, clothes-pins and spools were much more playthings than objects of household use, therefore they go under "Play;" thimbles, thread and needles, she had no personal use for and they go under "House." "Words from pictures and stories" comprise all those nouns that are not learned from real life, yet they are words that she adopted into her play or conversation; a large number of animal and bird names find their place here. As she later learned some of these from real life they are transferred into their appropriate classes, the change being indicated by a star followed by the year when this took place. Many words drop out of a child's vocabulary; they may be lost permanently or they may reappear in later years. Parentheses () around a word show that it dropped out; if followed by one or two numerals it reappeared in the years indicated, as in the four year vocabulary (anxious),⁵ "anxious" being used at four and five but not at six; or in the three year vocabulary (soil)^{4and6}, "soil" being used at three, four and six, but not at five. All words without parentheses were used every year after they first appeared. N.W. means New Words; T.W. means Total Words.

NOUNS.

1½, 102; 3, 625; 4, 975; 5, 1371; 6, 1751.

I. *Personal Experiences.*

1½, 40; 3, 226; 4, 290; 5, 400; 6, 502.

1. Body.

1½: T.W.=11.

Ear, eye, finger, foot, hair, hand, head, knee, mouth, nose, toe.

3: N.W.=20; T.W.=31.

Arm, bones, cheek, chin, curls, face, forehead, heart, heel, lap, leg, lip, nail, neck, shoulders, teeth, throat, thumb, tongue, tummy.

4: N.W.=8; T.W.=39.

Back, blood, brain, lungs, mucous, skin, (skull), voice.

5: N.W.=19; T.W.=57.

Bladder, bloodvessel, body, buttocks, chest, dimples, elbow, eyebrows, fist, muscles, pores, ribs, saliva, soles, stomach, tears, toe-nail, urine, wrist.

6: N.W.=12; T.W.=69.

Backbone, gums, hip, jaws, knuckles, marrow, nostrils, perspiration, spinal cord, sweat, taste-bud, voice-box.

1a. Health.

3: T.W.=8.

Alcohol, bite, castor oil, cold, enema, olive oil, sliver, witch hazel.

4: N.W.=8; T.W.=16.

Bacteria, disease (measles)⁶, (mumps), poison, scab, tummy ache, (vaccination).

5: N.W.=12; T.W.=25.

(Ammonia), hiccough, (malaria), medicine, scar, scarlet fever, scratch, sickness, sores, sting, (sunburn), (ventilation).

6: N.W.=14; T.W.=36.

Appendicitis, camphor ice, camphorated oil, chicken pox, chill, cut, dose, iodine, indigestion, pills, tonic, upset, vaseline, whooping cough.

2. Clothes.

1½: T.W.=9.

Button, coat, didy, hat, mitten, pin, pocket, shoe, spot.

3: N.W.=32; T.W.=41.

Apron, band, belt, bloomers, buckle, button hook, chain, clothes, collar, drawers, dress, garter, handkerchief, hooks, leggins, night gown, overalls, ribbon, romper, rubbers, safety-pin, sandals, shirt, skirt, sleeping bag, slippers, stocking, sweater, wrapper. Hole, (stain), tear.

4: N.W.=3; T.W.=44.

(Material), socks, sunbonnet.

5: N.W.=15; T.W.=57.

(Ankle tie), boots, cap, dicky, (embroidery), lace, (mackintosh), moccasin, (sash), (streamers), stripes, tennis shoes, underclothes, waist, (wraps).

6: N.W.=17; T.W.=66.

Bonnet, button holes, cape, clothing, elastic, fastener, garment, jacket, necklace, petticoat, raincoat, sleeves, straw, style, under shirt, straw, union suit.

2a. Toilet.

1½: T.W.=3.

Bath, comb, soap.

3: N.W.=7; T.W.=10.

Brush, cotton, powder, tangle, tooth brush, tooth powder, towel.

- 4: N.W.=1; T.W.=11.
Snarl.
- 5: N.W.=3; T.W.=14.
Soap-dish, sponge, wash-cloth.
- 6: N.W.=2; T.W.=16.
Soap-suds, sponge-bath.

3. Food.

- 1½: T.W.=6.
Bread, milk, orange juice, potato, salt, water.
- 3: N.W.=50; T.W.=56.
Apple, apple-sauce, bacon, banana, beets, berries, biscuit, broth, bun, butter, cake, carrots, cheese, cherries, chocolate, coffee, corn, corn bread, corn flakes, cracker, cream, cream of wheat, crumb, crust, doughnuts, drink, egg, graham crackers, grapes, ice cream, junket, macaroni, meat, nut, oatmeal, orange, peach, peanut, pear, peas, pudding, pumpkin, raspberry, rice, soup, strawberry, sugar, tapioca, tea, toast.
- 4: N.W.=9; T.W.=65.
Beans, cereal, cookies, food, jelly, lettuce, onions, prunes, radish.
- 5: N.W.=15; T.W.=80.
Beef, candy, chocolate rolls, cocoa, frosting, fudge, loaf, muffin, (mush), pepper, peppermint, pickles, pie, sandwiches, sugar lumps.
- 6: N.W.=11; T.W.=91.
Asparagus, baking powder, cream cheese, educator, dough, gingerbread, gruel, pop-corn, short-cake, tomatoes, walnuts.

3a. Eating.

- 1½: T.W.=3.
Bib, dish, spoon.
- 3: N.W.=17; T.W.=20.
Bell, breakfast, crack, cup, dinner, dining table, dining room, fork, knife, lunch, napkin, pitcher, plate, supper, table cloth, tea-kettle, tray.
- 4: N.W.=4; T.W.=24.
Bowl, dessert, meal, nibble.
- 5: N.W.=3; T.W.=27.
Feast, saucers, slice.
- 6: N.W.=3; T.W.=30.
Ladle, nick, tablespoon.

4. Play and Occupations.

- 1½: T.W.=8.
Block, boat, box, jar, stick. Book, card, paper.
- 3: N.W.=43; T.W.=51.
Ball, balloon, bank, beads, bubbles, cans, cart, clothespins, doll, drum, game, pail, peg, penny, present, race, rattle, sandpile, shovel, sled, spool, string, tower, toys, treasure, valentine, wagon, wheel, wheelbarrow. Catalog, crayons, dance, magazine, music, page, paints, pencil, picture, poem, post card, song, story, words.
- 4: N.W.=28; T.W.=79.
Bar, (captain), creature, croquet, leader, plasticine, pole, procession, see-saw, slide, soap-bubbles, swing, tag, Teddy-bear, tricks. Blackboard, buttoning frames, circle, cylin-

ders, exercise, insets, letters, line, map, mark, school, square, (triangle).

5: N.W.=17; T.W.=94.

Canoe, cattle car, (cock-horse), cord, cradle, den, earthquake, jewel, marble, rag, somersault, swimming pool, (tea-cup), tea-party, trowel, wigwam. Apparatus.

6: N.W.=49; T.W.=141.

Ark, basket ball, blots, chalk, collection, compass, contraction, cowboys, fire crackers, flexible flier, foot ball, hiding place, hunt, jack o' lantern, mallet, net, nickle, paddles, parquetry, paste, pedals, plane, possessions, puzzle, raft, rocking-horses, snowball, sparklers, strainer, torpedoes, trench, tricycle, velocipede, yarn. Address, calendar, cardboard, diamond, dictionary, encyclopedia, globe, history, kindergarten, lesson, pad, pattern, poetry, rhyme, tales.

4a. Experiences.

3: T.W.=9.

Dream, hug, kiss, nap, rest, shadow, sleep. Bang, noise.

4: N.W.=3; T.W.=12.

Journey, picnic, trip.

5: N.W.=34; T.W.=46.

Drive, job, party, play, quarrel, reflection, ride. (Crackle), crash, (rap), (slam), sound, (splash), squeak, squeal, (tap), (whisper), whistle. (Bound), bump, fall, fight, hold, jump, leap, (pat), (peek), pull, (push), (rising), (run), (rush), (slip), (whack).

6: N.W.=23; T.W.=54.

Airing, collision, expeditions, feats, frolic, lick, sale, sniff, squabble, task, treat, visit. Call, knock, patter, rustle, screeching, shout. Flash, jerk, load, tug, tumble.

II. *Indoor Environment.*

1½, 14; 3, 122; 4, 150; 5, 187; 6, 209.

i. *House and Furnishings.*

1½: T.W.=12.

Bathtub, bed, cellar, chair, clock, coal, door, floor, house, key, light, table.

3: N.W.=94; T.W.=106.

Ashes, basin, basket, bathroom, bedroom, blanket, book case, bottle, broom, bureau, candle, candlestick, ceiling, chamber, chest, chimney, closet, cloth, cork, couch, crib, curtain, cushion, desk, drawer, dust, duster, envelope, fire, fireplace, furnace, gas, glass, glue, hall, hammer, hammock, (hamper)⁴, handle, hanger, heater, high chair, home, ink, lamp, looking glass, mantel piece, match, mirror, nail, needle, newspaper, oven, pan, parlor, pen, piano, pillow, pipe, post, roof, room, rope, rug, scissors, screen, screw, sewing machine, shades, sheet, shelf, sideboard, sofa, stairs, stamp, strap, stove, telephone, thimble, thread, trunk, tub, typewriter, umbrella, veranda, wall, wall paper, wash stand, waste basket, weighing machine, window, wire, wood.

4: N.W.=22; T.W.=128.

Axe, bench, board, bundle, cupboard, electricity, flames, mop, package, (pantry)⁵, porch, refrigerator, register, rocking chair, saw, sleeping porch, stopper, study, suit case, tank, tools, (varnish).

- 5: N.W.=34; T.W.=160.
 (Banister), castor, china, blotter, faucet, fireless cooker, furniture, gasoline, hallway, (hat-rack), kitchen, knob, (junk), leather, (microscope), pillow-case, plaster, play-room, (railing), ruler, screen-door, set, soot, spark, steps, store-room, sun-porch, tag, thermometer, vase, violin, (wardrobe), wax, window-sill.
- 6: N.W.=24; T.W.=177.
 Aluminum, attic, case, chute, cot, counterpane, decoration, dish pan, flashlight, fringes, icebox, mattress, pewter, pin cushion, puff, quilt, rack, screw-driver, shoe bag, shutter, spout, tack, tape, window pane.
2. Other's Belongings.
- 1½: T.W.=2.
 Bag, muff.
- 3: N.W.=14; T.W.=16.
 Camera, fan, glasses, gloves, hairpins, hatpin, lather, money, necktie, purse, sack, suspenders, trousers, watch.
- 4: N.W.=6; T.W.=22.
 Bracelet, film, overcoat, revolver, suit, trimming.
- 5: N.W.=5; T.W.=27.
 Beard, gold, ring, tie, whiskers.
- 6: N.W.=5; T.W.=32.
 Dollar, nipple, shawl, sword, veil.

III. Outdoor Environment.

1½, 25; 3, 184; 4, 356; 5, 505; 6, 658.

1. Civilization.

1½, 5; 3, 45; 4, 81; 5, 128; 6, 148.

1½: T.W.=5.

Barrel, car, go-cart, sleigh, (choo-choo).

3: N.W.=41; T.W.=45.

(Arch)⁵ & ⁶, automobile, barn, bicycle, bonfire, building, carriage, church, circus, city, engine, factory, fair, farm, fence, field, flag, gate, (hurdy-gurdy), laboratory, mail-box, path, road, roller skates, sail boat, seat, smoke, station, steamboat, steam engine, store, street, subway, ticket, town, track, train, trolley-car, tunnel, (watering cart)⁴, yard.

4: N.W.=38; T.W.=81.

Baggage-car, (bran)⁵, bridge, (bridle), bungalow, countries, dining car, fire-engine, fireworks, fly trap, fountain, garage, garden house, grain, grindstone, gun, hay, headlight, henhouse, kite, mail, (observation car), parade, reins, roadside, (runabout), saddle, scare-crow, sidewalk, smoker, state, (steeple), (teams), trap, university, village, whip, woodshed.

5: N.W.=52; T.W.=128.

(Ball-game), (belfry), bricks, brooder, caboose, cannon, (cartridge), celebration, cinders, coop, (couplings), crank, eaves, ditch, (ferryboat), freight car, (highway), hinges, hoe, horn, hose, incubator, jitney, (junction), kerosene, ladder, lawn, lawnmower, (local), museum, pavement, rail, railroad, rake, rust, shed, shingles, ship (shorts), staff, stake, stonewall, summer-house, switch, tent, tie, tire, turnaround, water meter, well, woodpile.

6: N.W.=31; T.W.=148.
 Alley, baggage, brake, buggy, campus, delivery wagon, dining-hall, elevator, fire-lane, fire department, grave, grave-yard, keg, machinery, mill, mill wheel, pillars, pitch-forks, rubbish, sawmill, separator, signboard, smash-up, spikes, stable, steel, strips, trap-door, trash, water-trough, wreck.

2. Sky and Landscape.

1½: T.W.=3.

Moon, sky, snow.

3: N.W.=27; T.W.=30.

Air, bank, clouds, country, dirt, ground, hill, ice, lake, mountain, mud, ocean, pond, puddle, rain, river, rock, sand, shade, spring, stars, sun, sunshine, thunder, valley, (weather)⁴, wind.

4: N.W.=15; T.W.=45.

Brook, island, lightning, pool, rainbow, sea, shower, stones, storm, stream, sunset, (Venus)⁶, waves, (whirl)⁵, world.

5: N.W.=21; T.W.=64.

Breeze, daylight, (downpour), flood, foam, frost, icicles, land, ledge, meadow, mica, mist, moonlight, pasture, prairie, sunlight, stepping-stones, sunbeams, temperature, view, waterfall.

6: N.W.=20; T.W.=81.

Backwater, boulder, burrow, canal, dam, darkness, earth, fertilizer, hollow, moisture, mound, pebbles, quartz, quicksand, rainfall, shore, source, swamp, trap rock, water vapor.

3. Plants.

1½: T.W.=2.

Flower, grass.

3: N.W.=21; T.W.=23.

Buttercup, (daffodil)⁴ & ⁶, daisy, dandelion, (lilac)⁴, oaks, ragweed, rose, violet. Bark, fern, flowerpot, (grove)⁴, leaf, log, oakball, plant, pollen, seed, thorns, tree.

4: N.W.=57; T.W.=80.

(Anemone)⁶, blueberry, blue-eyed grass, bluets, chickweed, clover, column flower, (coreopsis)⁶, evening primrose, (flea-bane)⁶, forget-me-not, (four o'clock), horsetail, lily, (mustard)⁶, (neck-weed), Nothoscordum, (pepper-grass)⁶, pine, poison ivy, poppy, poppy mallow, shepherd's purse, spring beauty, sumach, sweet peas, thistle, (toadflax), (Venus' looking glass), (wood sorrel), (yellow puccoon). Acorn, acorn cups, blossom, branch, briar, bud, bush, moss, pine cone, pine-needle, root, stem, vine, weeds, woods. Apple-tree, cabbages, corn, currants, garden, gooseberries, gourds, grape vine, peach tree, pear tree, wheat.

5: N.W.=36; T.W.=103.

(California poppy), cedar, elm, (fox-glove), golden rod, huckleberries, (iron plant), juniper, (Madeira vine), maple, milkweed, mountain laurel, pansy, (pink yarrow), St. John's wort, (sheep laurel), (snap dragon), steeple-bush, white birch, (white yarrow), wild roses, yellow clover. (Bur), fungus, lichen, limb, mushroom, petals, pitch, (pods), toadstool, twig. Corn stalk, orchard, (vegetables), vineyard.

- 6: N.W.=50; T.W.=142.
Amanita, arbutus, balsam apple, bellwort, blueflag, buffalo bur, checkerberry, columbine, coral mushroom, cowslips, fringed polygala, grey birch, hawkweed, hellebore, Jack-in-the-pulpit, lady slipper, maiden hair fern, mulberry tree, nasturtium, peony, pitch pine, poet's narcissus, poison sumach, puff ball, saxifrage, shad bush, skunk cabbage, smartweed, sweet fern, trillium, water lily, wild geranium, wild oats, wood betany. Bouquet, bulbs, crops, evergreens, forest, mould, nectar, pistil, sap, seed vessel, spines, sprout, stalks, stamens, stumps, water plants.
4. Animals.*
1½, 15; 3, 86; 4, 150; 5, 210; 6, 286.
- a. Insects.
3: T.W.=10.
Ant, bee, beetle, bug, bumblebee, butterfly, caterpillar, fly, mosquito, wasp.
4: N.W.=19; T.W.=29.
Cockroach, cricket, cutworm, drone, flea, grasshopper, grub, honeybee, insect, ladybug, moth, plant lice, (queen bee)⁵, walking stick, (worker bee). Bee-hive, buzz-buzz, honey, swarm.
5: N.W.=6; T.W.=34.
Blue-bottle fly, dragon-fly, fire-fly, horse fly, water-striders. Hornet nest.
6: N.W.=17; T.W.=49.
Caddis, gnat, katydid, lice, maggots, rose-bugs, silver fish, tent caterpillar, whirligig beetle. Abdomen, cells, chrysalis, feelers, honey-comb, larva, secretion, tentacles.
- b. Other Invertebrates.
3: T.W.=3.
Snail, spider, shell.
4: N.W.=6; T.W.=9.
Angleworm, crawfish, daddy-long-legs, worm, cobwebs, spider webs.
5: N.W.=1; T.W.=10.
(Crawdaddies).
6: N.W.=6; T.W.=15.
Leech, lobster, mussel shell, slug, sow-bug, mites.
- c. Fish, Amphibians, Reptiles.
1½: T.W.=1.
Frog.
3: N.W.=7; T.W.=8.
Fish, goldfish, pollywog, snake, toad, turtle. (Fish food)⁴.
4: N.W.=6; T.W.=14.
Horned toad, lizard, salamander, tadpole, terrapin. Aquarium.
5: N.W.=11; T.W.=24.
Black snake, bull frog, Dinosaur, leopard frog, snapping turtle, (swamp tree frog), tortoise, wood frog. Fish-line, prickles, scales.
6: N.W.=17; T.W.=40.
Box turtle, butterfly, common toad of the western plains, garter snake, grass snake, green frog, milk snake, minnows, northern frog, painted turtle, pickerel frog, spotted turtle, spring peeper, trout. Coils, fins, membrane.

* For other animal names look under "Words from Pictures and Stories."

d. Birds.

1½: T.W.=5.

Bird, hen, rooster. Caw-caw, cock-a-doodle.

3: N.W.=22; T.W.=27.

Bluejay, chickens, duck, eagle, English sparrow, goose, (grackle)⁴ & ⁶, hawk, (junco)⁴, pigeons, sea-gull, swan, turkey, woodpecker. Bill, cages, dust baths, feather, gobble-gobble, nest, quack, wing.

4: N.W.=19; T.W.=46.

Bobwhite, chewink, chickadee, (cock)⁵, dickcissel, dove, duckling, king bird, meadow lark, mocking bird, night hawk, parrot, peacock, phoebe, robin, whippoorwill, wren. Chickadee-dee, droppings.

5: N.W.=20; T.W.=65.

Chipping sparrow, cardinal, cowbird, crow, (drake), fowls, (great crested fly catcher), (hairy wood pecker), oven-bird, partridge, pelican, (poultry), red-headed woodpecker, swallow. Comb, crest, down, (nest box), note, perches.

6: N.W.=29; T.W.=89.

Bantam, bobolink, brown thrasher, canary, cat-bird, cedar waxwing, chimney swift, flicker, gander, hummingbird, indigo-bird, oriole, penquin, scarlet tanager, scissors-tailed fly catcher, song sparrow, thrush, vireo. Breast, crop, earlobe, flock, fluff, mate, nestlings, peep-peep, roup, tuft, wattles.

e. Mammals.

1½: T.W.=9.

Cow, dog, horse, kitty, puppy. Bow-wow, moo, meow, tail.

3: N.W.=29; T.W.=38.

Bear, bunny, calf, camel, cat, deer, donkey, elephant, fox, goat, kittens, lamb, lion, monkey, mouse, oxen, pig, pussy, rabbit, rat, sheep, skunk, squirrel, tiger. Bah-bah, umph, umph. Fur, horns, pet.

4: N.W.=14; T.W.=52.

Baboon, bat, Belgian hare, buffalo, bull, chipmunk, guinea pig, jack rabbit, mules, pony, 'possum, raccoon, sea lion. Wool.

5: N.W.=25; T.W.=77.

Animals, cattle, colt, grey squirrel, nanny-goat, polar bear, ram, red squirrel, wood chuck. Bark, claw, grunt, paw, snort. [Epithets used in talking to or of animals] (Chatter box), climber, (dawdler), dear, dearie, fellow, (jumper), lazybones, (sleepy-head).

6: N.W.=21; T.W.=94.

Beasts, billy goat, cotton-tail, elk, fawn, heifer, pups, seal, sow. Bristles, cud, female, flesh, hoof, horse-hair, male, pest, prey, skeleton, walker, young.

IV. People.

1½, 7; 3, 23; 4, 38; 5, 58; 6, 74.

1½: T.W.=7.

Baby, boy, girl, lady, Mamma, man, Papa.

3: N.W.=16; T.W.=23.

Aunt, brother, child, cousin, father, grandma, grandpa, mother, sister, uncle. Friend, people, visitors. Carpenter, clown, teacher.

- 4: N.W.=15; T.W.=38.
Family, grandchildren, son, person. Baker, cook, conductor, doctor, (driver), fisherman, iceman, policeman, porter, (student), (sugar-plum).
- 5: N.W.=23; T.W.=58.
(Babe), daughter, grandmother, husband, parents, wife, woman. Crowd, (master), neighbors. Barber, fireman, (hunter), sailor, (storekeeper), (twins), washerwoman, workmen. Darling, (runner), slow-poke, (sweetheart), (terror).
- 6: N.W.=24; T.W.=74.
Adult, ancestor, bride, bridegroom, infant, relatives, tot, youngsters. Company, guests, group, maiden, playmates, tribe. Agent, artist, cavalry, dentist, farmer, naturalist, partner, servant, sleeper, thrower.

V. *Words from Pictures and Stories.*

- 1½, 14; 3, 18; 4, 43; 5, 64; 6, 89.
1½: T.W.=14.
Bear*³, butterfly*³, duck*³, fox*³, monkey*³, mouse*³, owl, rat*³, snail*³. Buttercup*³. Bah-bah*³, gobble-gobble*³, r'r [for lion], umph, umph*³.
- 3: N.W.=16; T.W.=18.
Alligator*⁶, (lambikin)⁴. Mallard duck, oriole*⁶, reindeer, thrush*⁶, wolf. (Bower)⁴, (bugle)⁴, crown, (market)⁴. Angel, fairy, king, queen, (robbers)⁴.
- 4: N.W.=25; T.W.=43.
Armadillo, (badger), crab, crocodile, (ferret), giraffe, hedgehog, jackal, kangaroo, porcupine, spider monkey, whale, wild-cat, zebra. (Pot). Dragon, dwarf, (enemy)⁶, giants, (heaven)⁵, (shepherd), (spirit)⁶, tailor, unicorn, witch.
- 5: N.W.=32; T.W.=64.
Angel fish, cobra, coral snake, coyote, (cub), lioness, lobster*⁶, mongoose, otter, rattlesnake, scorpion, starfish, walrus, weasel, wild boar. Castle, (cudgel), (jail), jungle, palace, (stile), submarine, throne, (trumpet). Devils, (ghost), (magician), (mayor), ogre, princess, volcano, war.
- 6: N.W.=35; T.W.=89.
Beaver, bighorn, chuck-will's widow, copperhead, dolphin, elephant bird, Gila monster, heron, leopard, moose, myas, ostrich, panther, peccary, puma, rhea, rhinoceros, shark, sloth, tern, toucan. Airship, enchantment, lodge, magic, shield, tepee. Army, attendants, battle, champion, hero,imps, knight, mermaid, settlers.

VI. *Abstract, Time, Position, etc.*

- 1½, 2; 3, 52; 4, 98; 5, 157; 6, 219.
- I. Time.
- 3: T.W.=9.
Birthday, day, minute, morning, night time, o'clock, spring, time, today.
- 4: N.W.=15; T.W.=24.
Afternoon, age, bedtime, evening, half-past, month, night, summer, to-morrow, tonight, week, winter, while, year, yesterday.

* These words were learned from real life in the years indicated.

- 5: N.W.=6; T.W.=30.
Daytime, moment, (nightfall), second, supertime, wedding.
- 6: N.W.=6; T.W.=35.
Half-hour, holiday, hour, instant, noon, rate.
2. Position.
- 3: T.W.=11.
Back, bottom, corner, cover, edge, end, front, middle, place, side, top.
- 4: N.W.=3; T.W.=14.
Beginning, row, (tippity-top).
- 5: N.W.=9; T.W.=22.
Center, curve, inside, midst, opening, outside, space, tip, (tip-top).
- 6: N.W.=10; T.W.=30.
Arrangement, cubby-hole, direction, file, gap, outline, patch, point, twists.
3. Quantity.
- 1½: T.W.=1.
Pieces.
- 3: N.W.=6; T.W.=7.
Bit, drops, half, inches, part, pile.
- 4: N.W.=7; T.W.=14.
Amount, lot, miles, numbers, (pairs), rest, speck.
- 5: N.W.=10; T.W.=23.
(Bunch), chunk, clump, deal, dozen, heap, lump, (pint), scrap, trace.
- 6: N.W.=7; T.W.=28.
Group, hordes, masses, quarter, remains, share, spoonful.
4. Indefinite.
- 3: T.W.=7.
Anybody, anything, everybody, everything, nothing, somebody, something.
- 4: N.W.=1; T.W.=8.
Nobody.
- 5: N.W.=0; T.W.=8.
- 6: N.W.=0; T.W.=8.
5. Abstract Nouns.
- 1½: T.W.=1.
Pity.
- 3: N.W.=17; T.W.=18.
Attention, color, confusion, enough, fun, heat, help, joke, kind, matter, mistake, name, smell, stuff, thing, trouble, way.
- 4: N.W.=20; T.W.=38.
Account, adventures, care, fault, comparison, (dryness), experiments, (feelings)⁵, harm, joy, life, mind, (question)⁶, (self)⁶, (sight)⁶, (sign)⁵, sort, taste, thought, work.
- 5: N.W.=40; T.W.=74.
(Accident), answer, (blackness), |(chance), custom, damage, death, |(disaster), energy, (fear), foolishness, habit, (happiness), (hunger), (idea), (language), (law), (length), nature, (notion), nuisance, plan, |(power), promise, (protection), punishment, reason, reward, secret, sense, shape, size, suffrage, (talk), (thirst), truth, use, waste, (weight), (wonder).

6: N.W.=61; T.W.=118.

Advice, affairs, anti-suffrage, art, blame, blessing, burden, caution, choice, civilization, danger, desire, difference, discovery, dispute, disturbance, effect, example, freedom, fuss, gains, government, gravity, grief, handicap, height, hindrance, hurry, lie, looks, luck, manners, nonsense, object, order, pleasure, plenty, problems, progress, pursuit, sake, scheme, shelter, sort, strength, suggestion, surprise, tribulations.

VERBS.

1½, 10; 3, 246; 4, 380; 5, 521; 6, 638.

1½: T.W.=10.

Caught, cry, dance, fall, gone, kiss, look, pat, see, sing.

3: N.W.=236; T.W.=246.

Am, amuse, answer, aren't, (arranging)⁴, ask, bark, be, belong, bite, (bless)⁴, blow, bother, bounce, break, bring, brush, build, bump, burn, burst, button, buy, call [cry], (call [visit])⁴, can, care, carry, change, chase, chew, clap, clean, climb, comb, come, cook, cough, could, count, cover, creep, cross, crow, cuddle, cut, die, dig, do, draw, dream, dress, drink, drop, dump, dust, eat, excuse, fasten, feed, feel, fight, fill, find, fit, fix, fly, fold, gargle, get, give, glue, go, grab, grow, guess, hang, happen, hatch, have, hear, help, hide, hit, hold, hook, hop, hope, howling, hug, hunt, hurt, hurry, is, isn't, jump, keep, kick, kneel, knock, know, laugh, leak, lean, leave, let, lie [recline], lift, like, listen, live, lock, lose, mail, make, march, mark, mean, measure, meddle, mend, might, mind, mix, muss, named, need, obey, open, ought, pack, paint, paste, pay, peek, pick, pin, pinch, play, poke, pound, pour, press, prick, pull, push, put, rain, rap, reach, read, rest, ride, ring, rock, rub, run, sail, save, scratch, see-saw, send, sew, shave, shine, shoo, show, shut, sit, sleep, slide, smash, smell, sneeze, snow, (snuggle)⁴, (soil)⁴ & ⁶, spank, spill, spit, splash, squeak, squeeze, stand, stay, step, stick, sting, stop, stuff, stumble, suppose, swallow, sweep, swim, take, talk, tangle, taste, tear, tell, thank, think, throw, tickle, touch, try, tumble, turn, unbuckle, undo, undress, unfasten, unlock, unwound, visit, wait, wake, walk, want, was, wash, watch, wave, wear, weigh, went, wet, whistle, wiggle, will, wind, wipe, wonder, would, write, yell.

4: N.W.=134; T.W.=380.

(Acquainted)⁶, attending, back, bake, beat, begged, believe, bend, (blast), bleed, borrow, buried, breathe, butter, buzz, (concerned), crack, crawl, (crinkle), decorated, decided, despise, (disgusted), drag, drip, drive, dry, (dye), encourage, evaporate, (explain), fishing, flap, float, forget, gallop, gnaw, gobble, greet, growl, grunt, (grumble), hand, harness, hate, haul, (imagine), invite, lay, learn, lick, light, love, manage, married, meet, (moo), move, must, nail, nibble, nip, nod, (order), own, peck, plant, poison, pop, prance, pretending, punch, punish, (quarreled), raised, rattle, (represent), remember, rescue, rinse, (rob)⁶, roll, rush, say, scamper, scrape, scream, scrub, scuttle, seem, sell, set, settle, sharpen, shook, shoot, sigh, skin, skip, slips, sniffing, sound, sprang, sprinkle, squashing, (squirm), start, stealing, suck, (suit), swell, swing, (tease), tip,

treat, travel, (trooping), tug, twist, understand, untie, used, (vaccinate), wade, warm, waste, (weed), (weep), whip, whisper, (whoop), wither, wish, work.

5: N.W.=172; T.W.=525.

(Act), (annoy), (baptize), bear, (behave), (bellowing), blot, bound, (bubble), (bunting), burrow, butted, camp, (celebrate), (chapped), choke, (chop), christened, clear, cling, (cock), (collapse), complain, (contradict), (cool), (couples), crank, crash, croak, crowd, crumple, cure, curl, dare, (darkened), dash, dawdle, delay, desert, digested, (disappear), (disobey), (distress), disturb, dive, (droop), drown, (exhausted), expect, explore, (fade), (fan), fattened, feast, finished, (flaming), (flushed), followed, fool, (force), (fretting), frozen, gather, grieve, guard, guide, heal, hinder, hurl, (interfere), jiggle, (joke), kill, land, last, (latch), lend, (loosened), match, matter, miss, (nab), notice, (paddle), (part), (peer), perch, pile, (place), plan, please, (practice), promise, protect, realize, roar, roost, (rose), (ruined), rustling, quiet, scared, scatter, (scold), scramble, (screw), (seats), (seize), shall, shall, shelter, should, shrink, (sicken), (slam), (splash), smoke, soothe, snap, snip, spatter, speak, spend, spoil, spread, spurt, squeal, (squirt), startle, (stained), starve, steer, stooping, (storm), strain, stretch, struggle, study, (sunk), sunning, support, (sweat), (swooping), (tack), teach, telephone, (tempt), tired, toss, (train), (tremble), (trickle), (trimmed), trip, (trot), (trust), tuck, twinkle, unbutton, (unfold), (unlaced), (unrolling), (unwrap), upset, urge, (waddle), wander, warn, water, whack, wriggling, (wrinkled).

6: N.W.=178; T.W.=638.

Accomplished, aches, afford, alight, allowed, arose, arrived, attached, attack, bait, balance, bandaged, bang, batters, bathing, become, began, benefited, bind, blame, blind, blocked, blossomed, boiled, boost, bow, breed, bruised, carve, charging, cheer, choose, circle, clashing, close, colored, compared, concealed, connect, consider, continued, copy, correct, crumbling, crushed, curving, dabble, dampened, darted, daubing, deal, decay, decline, defend, depend, descended, deserve, destroyed, developed, disagree, displease, divide, dotted, drains, dwell, enjoy, escape, examine, exterminate, fear, fertilize, flitting, flow, formed, frisking, gained, giggle, gleaming, glided, grind, gulp, handle, harden, hibernate, increased, interrupt, invented, investigate, irritates, itches, jabbed, jammed, lead, leap, lined, lolling, may, melts, mislaid, mistaken, nosing, note, number, nurse, object, offered, parading, passed, pattering, peep, perish, planed, prevent, preserved, progressing, pronounce, puff, quarantined, recognize, refuse, returned, rhyme, risk, roamed, rout, scoop, scorched, scorns, scowling, secrete, serves, shaded, shaping, shed, shiver, shout, shovel, shriek, slap, slay, sloped, snatched, snoring, soared, split, spun, squabbling, squalling, stir, stoop, store, straighten, strap, strew, strike, stub, succeed, suggest, supply, sway, tamed, tied, tingle, track, trapped, tramping, trouble, trudge, trumpeting, untangle, venture, wallow, wheel, whizzing, wig-wag, won, wounded, yelp.

PRONOUNS.

1½, 0; 3, 30; 4, 32; 5, 41; 6, 44.

I. *Personal.*

- 3: T.W.=18.
He, her, hers, him, his, I, it, me, mine, my, myself, she,
they, them, we, you, yours.
4: N.W.=2; T.W.=20.
Our, us.
5: N.W.=6; T.W.=26.
Herself, himself, itself, ourselves, their, yourself.
6: N.W.=1; T.W.=27.
Thou.

II. *Relative.*

- 3: T.W.=1.
What.
6: N.W.=1; T.W.=2.
That.

III. *Interrogative.*

- 3: T.W.=3.
What, which, who.
5: N.W.=1; T.W.=4.
Whose.

IV. *Demonstrative.*

- 3: T.W.=4.
That, these, this, those.
5: N.W.=1; T.W.=5.
One.

V. *Adjective.*

- 3: T.W.=4.
All, other, some, same.
5: N.W.=1; T.W.=5.
Any.
6: N.W.=1; T.W.=6.
Another.

ADJECTIVES.

1½, 10; 3, 139; 4, 232; 5, 348; 6, 415.

I. *Article.*

- 3: T.W.=1.
A.
5: N.W.=1; T.W.=2.
The.
6: N.W.=0; T.W.=2.

II. *Demonstrative.*

- 3: T.W.=12.
Another, any, each, every, other, same, some, such, that,
these, this, those.
4: N.W.=1; T.W.=13.
Alike.
5: N.W.=2; T.W.=15.
Either, neither.
6: N.W.=0; T.W.=15.

III. *Interrogative.*

- 3: T.W.=2.
What, which.

IV. *Quantitative.*

- 3: T.W.=13.
All, (double)⁴ & ⁶, few, last, many, most, several. One, two, three, four, five, hundreds.
4: N.W.=10; T.W.=23.
Both, first, next, none, whole, six, seven, eight, nine, ten.
5: N.W.=5; T.W.=28.
Less, only, second, single, (third).
6: N.W.=0; T.W.=28.

V. *Qualitative.*

- 1½, 10; 3, 111; 4, 193; 5, 301; 6, 382.
- I. Color.
- 3: T.W.=15.
Black, blue, brown, gold, green, orange, pink, purple, red, white, yellow. Bright, colored, dark, shiny.
4: N.W.=7; T.W.=22.
Grey, rosy, scarlet, tan, (violet). Light, striped.
5: N.W.=8; T.W.=29.
(Blackish), greenish, (pinkish), reddish, (yellowish).
Pale, (pure), spotted.
6: N.W.=8; T.W.=34.
Bay, brownish, burnt sienna, olive green, purplish. Brilliant, speckled, whitish.
2. Spatial.
- 3: T.W.=13.
Big, far, fat, full, high, large, little, long, low, near, small, steep, tiny.
4: N.W.=8; T.W.=21.
Deep, great, level, monstrous, short, thin, tall, (wee-wee).
5: N.W.=17; T.W.=37.
Chubby, close, farthest, flat, front, hind, (hollow), mighty, narrow, round, solid, straight, thick, tremendous, upper, weeny, wide.
6: N.W.=4; T.W.=41.
Crooked, curved, overgrown, slim, stubby.
3. Sense.
- 1½: T.W.=1.
Cold.
3: N.W.=14; T.W.=15.
Cool, greasy, hard, hot, icy, sticky, sopping, soft, sore, stiff, sunny, sweet, warm, wet.
4: N.W.=11; T.W.=26.
Buttered, bloody, curly, firm, heavy, moist, rough, slippery, smooth, soapy, sour.
5: N.W.=12; T.W.=38.
Bitter, damp, delicious, dry, light, lukewarm, oily, rainy, saltier, scratchy, shady, watery.
6: N.W.=2; T.W.=40.
Raw, redhot.
4. General.
- 1½: T.W.=9.
Cunning, dirty, funny, good, nice, poor, pretty, sleepy, tired.

- 3: N.W.=59; T.W.=68.
 Afraid, alone, ashamed, asleep, (astonished)⁴, awake, (awful)⁴, bad, bare, best, busy, careful, clean, cloudy, comfortable, (cute), dangerous, darling, dead, dear, disappointed, discouraged, dusty, empty, fast, fine, friendly, glad, happy, holey, hungry, kind, lovely, merry, naughty, new, old, open, queer, quiet, right, ready, rubber, shut, sick, slow, sorry, south, surprised, stupid, (tender)⁴, terrible, thirsty, tight, wide open, windy, wrong, withered.
- 4: N.W.=57; T.W.=124.
 Alive, angry, (anxious)⁵, barefoot, beautiful, brass, brave, (breezy), careless, (cheerful), (cleverest), common, delighted, different, (eager)⁵, early, excited, fierce, fluffy, gay, gentle, (grown-up), (horny), (interested), iron, jolly, late, left, live, lonely, loose, north, own, (precious)⁵, prickly, prompt, proud, quick, real, (rich)⁵, ripe, rotten, safe, scared, set, silver, (spandy), splendid, stale, still, sure, tame, west, wild, (whirling), wooden, young.
- 5: N.W.=84; T.W.=197.
 Able, active, (attractive), blunt, bothersome, bushy, (chuckling), constipated, (contented), crazy, (cross), (deadly), deaf, delicate, (dizzy), downy, (dried-up), (dull), east, easy, (even), (exciting), fair, feathery, fond, foolish, fresh, greedy, horrid, (horrible), important, inky, interesting, lame, (left-hand), lively, magic, main, mean, nasty, (odd), (patient), perfect, (pointed), poisonous, (ragged), (regular), (right-hand), rocky, rude, ruffled, (ruffly), rusty, scrambled, sensible, sharp, shy, silly, (solitary), (stormy), (strange), strong, surprising, swampy, (swift), (terrific), thorny, through, tiresome, true, ugly, uncomfortable, (unfair), (ungrateful), unhappy, unpleasant, untidy, weak, (weakly), well, (wicked), wise, wonderful, worst.
- 6: N.W.=90; T.W.=253.
 Acrobatic, alarming, ancient, apt, awkward, barbed, bold, bony, bound, calm, capital, cheap, chief, copper, cultivated, dandy, delightful, difficult, dilapidated, doubtful, dumb, economical, enchanting, equal, especial, expensive, familiar, famous, fit, flowery, foggy, forked, free, furious, fuzzy, generous, grand, gorgeous, half-worn, harmless, harsh, hateful, helpless, horrified, home-made, impatient, inconvenient, industrious, liable, mad, miscellaneous, mistaken, naked, natural, neat, pebbly, pitiful, powerful, rare, remarkable, rid, ridiculous, roly-poly, royal, sandy, savage, secret, serious, sheltered, silent, sluggish, snaky, snarly, sound, spiny, steel, stray, sudden, thankful, ticklish, unbreakable, unprotected, untidy, unwilling, usual, vicious, washable, waterproof, weary, worth, worth-while.

ADVERBS.

1½, 6; 3, 62; 4, 102; 5, 158; 6, 166.

I. *Time.*

- 3: T.W.=11.
 After, again, always, ever, first, never, now, once, sometimes, then, when.
- 4: N.W.=7; T.W.=18.
 Ago, before, finally, soon, still, usually, yet.

- 5: N.W.=6; T.W.=24.
Already, at last, forever, later, seldom.
- 6: N.W.=1; T.W.=25.
Afterwards.

II. *Place.*

- 1½: T.W.=3.
Down, there, upstairs.
- 3: N.W.=20; T.W.=23.
Along, anywhere, away, behind, downstairs, here, in, indoors, inside, near, next, off, on, out, outdoors, outside, over, under, up, where
- 4: N.W.=12; T.W.=35.
Around, across, back, everywhere, far, farther, nearby, somewhere, through, underneath, upside down, way.
- 5: N.W.=14; T.W.=49.
Ahead, apart, backwards, forth, forward, (half-way), home, (nowhere), overhead, past, right, (to and fro), (wherever), wrong side out.
- 6: N.W.=6; T.W.=51.
Above, below, beyond, deeply, hither, thither.

III. *Manner.*

- 3: T.W.=12.
Carefully, exactly, horseback, how, nicely, quickly, right, slowly, so, together, well, why.
- 4: N.W.=10; T.W.=22.
Anyway, (awfully), apparently, better, busily, fast, head-first, promptly, perfectly, terribly.
- 5: N.W.=31; T.W.=52.
(Angrily), badly, (beautifully), carelessly, (directly), easily, finely, for instance, gently, (gayly), happily, hard, (horribly), (however), instead, kindly, (neatly), poorly, really, (sadly), simply, somehow, (sorrowfully), suddenly, surely, terrifically, tightly, truly, (unfortunately), (untidily), (vigorously).
- 6: N.W.=13; T.W.=53.
Anyhow, certainly, cheaply, diligently, entirely, lazily, lightly, peacefully, properly, regularly, roughly, rudely, soundly.

IV. *Degree.*

- 1½: T.W.=1.
All.
- 3: N.W.=10; T.W.=11.
Almost, as, else, enough, just, like, more, quite, too, very.
- 4: N.W.=9; T.W.=20.
A little, either, even, mostly, much, only, pretty, rather, especially.
- 5: N.W.=5; T.W.=25.
Barely, hardly, nearly, somewhat, (tremendously).
- 6: N.W.=4; T.W.=28.
Absolutely, at least, chiefly, scarcely.

V. *Modal.*

- 1½: T.W.=2.
No, please.
- 3: N.W.=3; T.W.=5.
Not, perhaps, yes.

- 4: N.W.=2; T.W.=7.
Maybe, possibly.
5: N.W.=1; T.W.=8.
Of course.
6: N.W.=1; T.W.=9.
Probably.

PREPOSITIONS.

- 1½, 0; 3, 21; 4, 23; 5, 32; 6, 33.
3: T.W.=21.
About, across, after, against, before, back of, behind, beside, between, by, for, from, in, of, off, on, through, to, under, up, with.
4: N.W.=2; T.W.=23.
Except, without.
5: N.W.=9; T.W.=32.
Above, around, at, beneath, but, into, over, towards, upon.
6: N.W.=1; T.W.=33.
Betwixt.

CONJUNCTIONS.

- 1½, 0; 3, 7; 4, 8; 5, 14; 6, 15.
3: T.W.=7.
And, because, but, if, so, than, whether.
4: N.W.=1; T.W.=8.
On.
5: N.W.=6; T.W.=14.
In order to, though, till, unless, until, while.
6: N.W.=1; T.W.=15.
Since.

INTERJECTIONS

- 1½, 5; 3, 9; 4, 13; 5, 13; 6, 13.
1½: T.W.=5.
Goodbye, good-morning, goodnight, hello, howd'you do.
3: N.W.=4; T.W.=9.
Oh, ouch, peek-a-boo, why.
4: N.W.=4; T.W.=13.
(All aboard), (dear me)⁵, ha-ha-ha, well.
5: N.W.=1; T.W.=13.
Hooray.
6: N.W.=1; T.W.=13.
Goody.

TABLE I

THE PARTS OF SPEECH—NUMBER OF WORDS

Age in years.....	1½	3	4	5	6
Nouns.....	102	625	975	1,371	1,751
Verbs.....	10	246	380	525	638
Pronouns.....	0	30	32	41	44
Adjectives.....	10	139	232	348	415
Adverbs.....	6	62	102	158	166
Prepositions.....	0	21	23	32	33
Conjunctions.....	0	7	8	14	15
Interjections.....	5	9	13	13	13
Total.....	133	1,139	1,765	2,502	3,075

The Grammar of the Vocabularies. At 18 months E's vocabulary contained 133 words; at three years 1,139 words; at four years, 1,765 words; at five, 2,502 words and at six, 3,075. Table I gives the numbers of the different parts of speech at the five different ages, and Table II gives their percentages.

TABLE II
PERCENTAGE OF THE PARTS OF SPEECH

Age in years.....	1½	3	4	5	6
Nouns.....	76.6	54.8	55.3	55.0	56.8
Verbs.....	7.6	21.6	21.5	20.8	20.7
Pronouns.....	0	2.6	1.8	1.6	1.5
Adjectives.....	7.6	12.2	13.1	14.0	13.7
Adverbs.....	4.5	5.4	5.8	6.2	5.4
Prepositions.....	0	1.8	1.3	1.3	1.0
Conjunctions.....	0	0.7	0.5	0.6	0.5
Interjections.....	3.7	0.9	0.7	0.5	0.4
Total.....	100.0	100.0	100.0	100.0	100.0

The percentages of the parts of speech are much the same at three, four, five and six years. From three to six there is a slight increase in the proportion of nouns and a slight decrease in the verbs, pronouns, prepositions, conjunctions and interjections. Adjectives and adverbs rise till they reach a maximum at five and then drop again at six yet not quite as low as they were at four years.

It is interesting to observe the increase of the different parts of speech from year to year using the vocabulary of the year before as a basis.

TABLE III
THE INCREASE OF THE PARTS OF SPEECH

	From three to four	From four to five	From five to six
Nouns.....	56.1	40.6	26.2
Verbs.....	54.1	38.1	21.5
Pronouns.....	6.6	28.1	7.3
Adjectives.....	66.2	50.0	19.2
Adverbs.....	64.5	55.0	5.0
Prepositions.....	9.5	39.1	3.1
Conjunctions.....	14.3	75.0	7.1
Interjections.....	44.4	0.0	0.0
Whole vocabulary.....	55.7	41.2	25.0

The increase in the whole vocabulary diminishes very rapidly, from 55 per cent between three and four, to 41 per cent

from four to five, and was only 25 per cent from five to six—that is, the six year old vocabulary was only 25 per cent larger than the five year vocabulary.

Nouns follow the percentage of the whole vocabulary closely each year; verbs fall slightly below it. Pronouns, prepositions and conjunctions have small increases at four and six, but large at five. Adjectives and adverbs make very large gains at four and five, but very slight gains at six.

Words Dropped Out. The older the child gets the larger is the proportion of words found in one vocabulary that did not reappear in the next. We cannot be sure how many of these are really forgotten. The following tables must not, therefore, be considered as conclusive but as only giving an indication of where the most words were dropped out.

TABLE IV
WORDS DROPPED OUT

	Numbers		Proportions	
	At five years	At six years	At five years	At six years
Nouns.....	57	153	4 per cent of remembered nouns	8 per cent
Verbs.....	27	92	5 per cent of remembered verbs	14 per cent
Adjectives.....	14	52	4 per cent of remembered adjectives	12 per cent
Adverbs.....	1	18	0.6 per cent of remembered adverbs	11 per cent
Interjections.....	1	2	8 per cent of remembered interjections	15 per cent
Total.....	100	317	4 per cent of the whole vocabulary	10 per cent

It will be seen that at five, four per cent is the proportion of the words forgotten to the whole vocabulary; nouns, verbs and adjectives follow this closely. But at six the proportion of forgotten words to the whole vocabulary has risen to ten; nouns are below this, with eight per cent, while verbs have 14 per cent, adjectives 12 and adverbs 11. One explanation for the high percentage of verbs may be that identical situations did not arise year after year to call them forth. At five, E. for some reason added a large number of adverbs and adjectives bringing her proportions in these parts of speech in her whole vocabulary to the highest point they ever reached. At six, her percentages of these parts of speech dropped back nearly to the four year level; therefore it is to be expected that she must have given up using many of these five year terms.

Of the adjectives it is almost entirely those from the general qualitative division that are dropped out. With the adverbs at six years, one of degree was forgotten, four of place and 13 of manner. It is interesting to examine the nouns in detail to see where the majority were dropped out.

TABLE V
PER CENT OF NOUNS DROPPED OUT IN PROPORTION TO THOSE
REMEMBERED IN EACH DIVISION

Age in years.....	5	6
Personal experiences.....	1.7	6.5
Indoor environment.....	1.0	4.5
Outdoor environment.....	5.0	8.2
Pictures and stories.....	11.0	20.0
People.....	0.8	5.0
Abstract, time, etc.....	4.0	12.0

It will be noted that stories have the largest percentage of forgotten words, that abstract words come next, then outdoor environment; then personal experiences, with people and indoor environment about equally small. The largest item in personal experiences are the 15 words under "experiences" denoting sounds and actions in which E. seemed to specialize at five, but used very little at six. Forgotten names of flowers are responsible for most of the outdoor words, and change of environment was the reason for forgetting them. That abstract words and stories furnish the largest percentages is what we would expect since these cannot be as vivid to a child as those words learned from real life. The words from stories are naturally changeable as the stories she hears each year are largely different.

As to the number of words forgotten from the different years, in the five year vocabulary, 24 were dropped from the three year vocabulary and 76 from the four year, that is, 24 per cent and 76 per cent. In the six year vocabulary 20 were lost from the three year vocabulary, 76 from the four year and 221 from the five year, or 6, 24 and 70 per cent respectively. (Of the 76 lost words from the four year vocabulary, 63 are identical for five and six, while 13 are different.) The interesting point about the proportions is the large number of words lost from the last preceding vocabulary. This means of course that the earlier words are the fundamental ones. But it also shows that there is a fluctuation in the words used by this child, that is, she apparently uses certain words for a while and then drops them in favor of others. This is evident from the large numbers of verbs, adverbs and adjectives she used at five and did not use at six, and to a less

degree those she used at four and did not use in one or other of the following years. I have additional evidence of this change in words since I took a partial vocabulary at five and a half, noting down the new words I heard without paying much attention to her speech. In this way I got 103 verbs, 30 adjectives, 7 adverbs and 173 nouns—many from stories and many abstract—none of which appear in her five and six year vocabularies. Thirty words that were new at five and a half, were repeated at six. Now at six and a half I hear her using a great many new words, some of them old ones that were left out of her five and six year vocabularies. It may be that environment and associates have a good deal to do with the matter; in the winter she sees mostly her parents and sisters, while in the summer she hears words from her cousins and other relatives. This explanation would not hold for the difference between the five and six year vocabularies, for in these cases the environment and associates were very much the same. It may well be that the speaking vocabularies of adults fluctuate in much this same way.

Rate of Learning. The rate of learning, as the vocabularies stand, is as follows: three words in the 14th month, one word in the 15th, one word every third day in the 16th, 1.5 words a day in the 17th month and three words a day in the 18th month. From the 18th month to three years the rate of learning was 2.1 words a day; from three to four, 1.7; from four to five, 2 words; and from five to six, 1.6. But if the forgotten words are not subtracted—and they should not be when the number of new words learned is being considered—then the rate of learning for the last two years is 2.3 words a day between four and five, and 2.5 words a day between five and six.

Mistakes and Omissions. In the former paper there were mentioned various mistakes and omissions in E's vocabulary. Of auxiliary verbs she used "can," "could," "might," "will," "would" at three years, "shall" and "should" at five, and "may" shortly after. "If" was used in connection with "whether"—"whether if"—from three years till past five, but the "if" was dropped at five and a half. "What" was her only relative until this same age when she began to use "that," but she had not added "which" or "who" at six. "The" was not used until 57 months, "a" being employed on all occasions. On none of these mistakes was she corrected by us, except on "what" as the relative.

E. learned "she" and "our" correctly, but at about two and a half substituted "her" and "we'er." At 51 months she used the proper terms about equally with the incorrect ones; at 53 months she had dropped the latter entirely. She

had used "I'm are" and "more better" until 51 months but corrected them herself at 53 months. Her mistakes now at six and a half are "matter of" instead of "matter with;" "it is" instead of "there is," and "tooken" instead of "taken."

In the former paper E's pronunciation was described in detail; her progress since then will be noted. At 55 months "sm" was "m" as "mell;" "sp," "b" as "bider;" "sk," "g" as "gunk;" "st," "d" as "done;" "th," "s" as "sistle;" "dh," "d" as "dat," "y," "l" as "lard," and "ing," "in'." At 57 months she had mastered "dh" and "y," at 58 months "sk," "sp" and "st;" at 59 months "sm" and "th," and at five years "ing." She was not drilled on

TABLE VI
NUMBER OF NOUNS

Age in years.....	1½	3	4	5	6
Body.....	11	31	39	57	69
Health.....	0	8	16	25	36
Clothes.....	9	41	44	57	66
Toilet.....	3	10	11	14	16
Food.....	6	56	65	80	90
Eating.....	3	20	24	27	30
Play and occupations.....	8	51	79	94	1 41
Experiences.....	0	9	12	46	54
I. Personal experiences....	40	226	290	400	502
House.....	12	106	128	160	177
Other's belongings.....	2	16	22	27	32
II. Indoor environment....	14	122	150	187	209
Civilization.....	5	45	81	128	148
Sky and landscape.....	3	30	45	64	81
Plants.....	2	23	80	103	142
Animals.....	15	86	150	210	287
III. Outdoor environment...	25	184	356	505	658
IV. Pictures and stories....	14	18	43	64	89
V. People.....	7	23	38	58	74
Time.....	0	9	24	30	35
Position.....	0	11	14	22	30
Quantity.....	1	7	14	23	28
Indefinite.....	0	7	8	8	8
Abstract.....	1	18	38	74	118
VI. Abstract, time, etc.....	2	52	98	157	219
Total.....	102	625	975	1,371	1,751

any of these mispronunciations after she was three years and nine months old. At five she was pronouncing entirely correctly except "noo" for "new," although she said "music" correctly. Since then she has attained "ew."

The Content of the Vocabularies. Nouns. The nouns at the different ages were divided into five main classes and 21 smaller divisions to show their sources.

TABLE VII
PERCENTAGES OF NOUNS

Age in years.....	1½	3	4	5	6
Body.....	10.9	5.6	3.1	4.1	3.9
Health.....	0	1.2	1.7	1.8	2.0
Clothes.....	8.8	6.6	4.6	4.1	3.7
Toilet.....	2.9	1.5	1.2	1.0	0.8
Food.....	5.9	8.4	6.7	5.8	5.0
Eating.....	2.9	3.1	2.6	2.0	1.7
Play and occupations.....	7.9	8.2	8.7	7.0	8.5
Experiences.....	0	1.6	1.1	3.3	3.1
I. Personal experiences.....	39.3	36.2	29.7	29.1	28.7
House.....	11.8	16.9	13.1	11.5	9.4
Other's belongings.....	1.9	2.6	2.2	2.0	1.8
II. Indoor environment.....	13.7	19.5	15.3	13.5	11.2
Civilization.....	4.9	6.8	8.3	9.0	8.4
Sky and landscape.....	2.9	5.5	4.7	4.7	4.7
Plants.....	1.9	3.7	8.2	7.6	8.3
Animals.....	14.9	13.5	15.5	15.5	16.5
III. Outdoor environment...	24.6	29.5	36.7	36.8	37.9
IV Pictures and stories.....	13.7	2.9	4.4	4.7	5.2
V. People.....	6.8	3.4	3.7	4.2	4.3
Time.....	0	1.5	2.6	2.3	2.1
Position.....	0	1.7	1.4	1.6	1.7
Quantity.....	0.95	1.1	1.4	1.7	1.6
Indefinite.....	0	1.1	0.8	0.6	0.5
Abstract.....	0.95	3.1	4.0	5.5	6.8
VI. Abstract, time, etc.....	1.9	8.5	10.2	11.7	12.7

At 18 months personal experiences loomed largest to the baby, being responsible for 39 per cent of her nouns; outdoor environment came next with 24 per cent; indoor environment had a small representation, only 13.7 per cent; while pictures and stories had an equal proportion due to her limited experience, for all but one of these words were names

or sounds of animals. People were important having 6.8 per cent, and abstract terms were very few, only two in number or 1.9 per cent of all her nouns.

At three, personal experiences had dropped a little, from 39 to 36 per cent; people had decreased from 6.8 per cent to 3.4 and pictures and stories from 13.7 to 2.9. Indoor environment rose from 13.7 to 19.5 per cent; outdoor environment from 24.6 to 29.5 and abstract from 1.9 to 8.5. At four there was another decided change: a large drop in the importance of personal experiences to 29 per cent and indoor environment to 15 per cent, a rise in words pertaining to people, —3.7,—pictures and stories—4.4—and abstract terms —10.2 per cent—and a large rise in outdoor environment to 36.7 per cent. The five and six year vocabularies have carried out these same tendencies but there have been no decided changes except in indoor environment, which dropped from 15.3 per cent to 11.2.

Taking the five vocabularies as a whole, there is a continuous decrease in personal experiences from 39.3 per cent at 18 months to 36.2 at three years, 29.7 at four, 29.1 at five and 28.7 at six. Outdoor environment shows a steady increase from 24.6 to 29.5, 36.7, 36.8 and 37.9 per cent. Abstract, time, position, etc., also show an unbroken rise from 1.9 to 8.5, 10.2, 11.7 and 12.7 per cent. Words denoting people and those from pictures and stories have a high proportion at 18 months, drop to a minimum at three years, and then gradually increase in the following years. Indoor environment is rather low at 18 months, reaches its maximum at three and then falls decidedly each year, reaching the 18 month level at five and falling below it at six.

Of the smaller divisions, those that have uniformly increased throughout the five vocabularies are words pertaining to health, animals and abstract terms; while those denoting clothes and toilet have steadily decreased. The other divisions though in general increasing or decreasing, show fluctuations that are not always possible to explain. Words denoting food rose at three, because the 18 month proportion was very small; after that they declined steadily, at six years going below the 18 month level. Words relating to parts of the body fell decidedly at three and four, rose again at five and fell a little at six. Play and occupations have staid about the same, while experiences show an almost uniform increase.

Words from the outdoor environment of civilization increase in all the vocabularies except the last where there is a slight fall. Sky and landscape are 2.9 per cent at 18 months, 5.5 at three and 4.7 per cent for the three following years. Words relating to plants show a tremendous increase at four—from

3.7 per cent to 8.2; they decreased slightly at five, and increased again to 8.3 at six.

These results are not just what I expected. When the great change in the proportions of the nouns at three and four years was apparent, I thought this would continue at about the same rate. It has continued, but at a much lessened rate. There are two factors to be considered: the development of the child and the influence of environment. At four, five and six years the environments were much the same, a village in Oklahoma throughout the fall, winter and spring, and the country in Massachusetts in the summers. At three the environment was decidedly different—that of a city in Massachusetts, although the child had much opportunity to see plants and animals. It seems as if the change of environment may have had more to do with the change in the distribution of her words than her own development had, since the five and six year vocabularies are so much like the four year.

Comparison with other children as to interests. Bateman ('16) has given the proportions of the nouns under "sources of materials" according to my method of divisions in the case of his two daughters and niece at the age of 28 months. The personal experiences of these three run from 53 to 61.5 per cent, indoor environment from 20 to 23.5 per cent, outdoor environment 8.7 to 12.2; words from books 0 to 2.9; people from 2.4 to 3.8; and abstract terms from 2.5 to 7.0 per cent. In comparison to E. at 18 months and three years, these children have much larger percentages from personal experiences and much smaller from outdoor environment than she.

Bohn ('14) follows Boyd's ('14) divisions for his child from nine months to twenty-seven months. I have added them up for 18 months, two years and 27 months, grouping them so that they correspond to my own main divisions. At 18 months his daughter had 120 nouns in her vocabulary; at two years, 315; and at 27 months, 481; proper nouns are omitted in these counts. Her proportions run as follows for the three ages: personal experiences, 45.8, 30.5, 25.6 per cent respectively; indoor environment, 28.3, 38.1 and 32.1 per cent; outdoor environment, 20, 21.3 and 28.8 per cent; people, 3.4, 2.7 and 3.7; abstract, etc., 2.5, 7.7 and 9.8. Here we see a continuous decrease in personal experiences, and increase in outdoor and abstract terms. Indoor environment rose to a maximum at two and then fell at 27 months; words relating to people decreased at two and rose again at 27 months. At 18 months this child's vocabulary seemed fairly typical, with personal experiences most important, indoor environment sec-

ond in numbers and outdoor environment third. But at two, indoor environment outstripped all others, and at 27 months, although its lead was less, it still had the most words. The unusual thing about this child is her small proportion of personal experiences and very large proportion from indoor environment. There may be some difference in the classification; certain words that others put under personal experience Bohn had probably included under "house" and "domestic." She has a large proportion from outdoor environment and at 27 months a great number of plant names—41. She also has a large percentage of abstract terms for so young a child.

Prof. Boyd very kindly supplied me with the proportions of nouns in his daughter's total vocabularies at three, four and five years and has given me permission to publish them.

TABLE VIII
PERCENTAGES OF NOUNS OF BOYD'S DAUGHTER

Age.....	17 months	3 years	4 years	5 years
Body.....	10	6.5	5.3	4.6
Health.....	0	2.6	3.2	3.2
Dress.....	17	9.5	8.2	6.9
Food.....	14	7.3	6.3	6.5
Play.....	10	5.9	6.9	6.8
Experiences.....	0	2.1	3.9	4.1
Personal experiences. . . .	51	33.9	33.8	32.1
House.....	0	3.4	3.9	3.5
Domestic.....	18	17.0	13.2	11.8
Personal belongings.....	4	2.5	2.2	2.9
II. Indoor environment. . .	22	22.9	19.3	18.2
Locomotion.....	3	3.0	2.7	2.9
Institutions.....	0	1.5	1.8	1.8
Meteorology.....	0	2.1	1.9	1.8
Topography.....	1	6.6	7.4	7.6
Plants.....	4	7.1	6.6	6.3
Animals.....	7	7.6	7.6	8.0
III. Outdoor environment. .	18	27.9	28.0	28.4
IV. People.....	11	6.8	7.0	7.6
Time.....	1	1.7	1.9	2.3
Quantity.....	0	1.8	2.5	2.1
Position.....	0	1.2	0.9	0.9
Ideal.....	0	3.9	6.7	8.3
V. Abstract, time, etc. . . .	1	8.6	12.0	13.6

Although Boyd's child at 17 months and mine at 18 have practically the same number of nouns, 99 and 102 respectively, yet their proportions are different. Boyd's child has larger percentages from personal experiences, indoor environment and people than mine, while mine has more from outdoors.

Since Bohn and Boyd do not use any division for words from pictures and stories and also do not count animal sounds as words as I have done, I herewith give E's proportions at 18 months worked out under these conditions. This would leave 92 nouns. Her personal experiences were 43.5 per cent, indoor environment, 15.2, outdoor environment 31.5, people 7.6 and abstract terms 2.2. This does not materially alter my results; the main difference is that outdoor environment has a larger proportion than ever.

The 17 month vocabulary of Boyd's daughter corresponds well in the distribution of nouns with Bateman's children at 28 months; personal experiences and indoor environment are nearly the same as his second daughter, but Boyd's child had more words from outdoor environment and people than Bateman's children did. Her three, four and five year vocabularies show a much more uniform distribution of her nouns than E's vocabularies do. Yet there is the same decrease in personal experiences and indoor environment, and increase in outdoor environment, people and abstract terms with both children. Boyd's child seems to have had no special change of environment to stimulate decided differences. Her personal experiences have a smaller proportion than E's at three and four, but larger than at five; indoor environment is larger at every year, and so are words for people and abstract words. Her percentage from outdoor environment is smaller than E's at every age and especially so at five. The chief difference is in the percentages of animal terms, Boyd's child's ranging from 7.6 to 8 and E's from 13.5 to 15.5.

Brandenburg (16) has published the percentages of his daughter's nouns at three and four years following my method. She shows a decided drop in personal experiences from 39.7 to 33.5 per cent, a slight increase in indoor environment from 15.9 to 17.3, and a slight increase in the other divisions; outdoor environment being 17.5 at three and 19.4 at four, people (proper nouns are included) 10.5 and 12.4; stories 0.7 and 0.8, and abstract terms 14.7 and 15.9. She had a change in environment between three and four. Her proportions of words for animals and plants are small in comparison to E., the former being 6.7 per cent both years, and the latter 1.8 and 2.8 per cent.

Boyd's, Brandenburg's and Bohn's children used more abstract terms than did my child.

Drevers ('15, III) divides the nouns of his three children at 28 months, 43 months and 54 months into "Home Environment," "Outside Environment," and "General and Abstract." It is difficult to make his classes correspond sufficiently well with those divisions used by the other writers so as to be able to use his vocabularies for comparative purposes. However these children show from the younger to the older, a decrease in the percentages of personal experiences and indoor environment, and increase in outdoor environment, in people and abstract terms.

To sum up, these ten children show considerable variation in the distribution of their nouns. Yet it seems as if the typical results and those we would naturally expect are a progressive decrease in the proportion of words relating to personal experiences and indoor environment and a progressive increase in those having to do with outdoor environment and abstract terms. My daughter exhibits this change of interests yet her proportions are probably not typical for she shows a smaller percentage of words from indoor environment and a larger percentage from outdoor environment than do the others. This is doubtless due to the fact that she is not in the least domestic, but is a devoted lover of nature.

Nature Vocabulary. In the following table there are given for all the ages in both numbers and percentages of all the nouns: 1st, the animals and related terms such as "wing," "antennae," "shell," "cud," etc., learned from real life; 2nd, actual animal names both from real life and pictures and stories; 3rd, all animal names and related terms, and finally

TABLE IX
VOCABULARY FROM NATURE

Age in years.....		1½	3	4	5	6
I. Animals and related terms learned from real life.....	Number...	15	86	150	210	287
	Per cent...	14.9	13.5	15.5	15.5	16.5
II. Actual animal names from real life and pictures and stories	Number...	18	75	141	188	252
	Per cent...	17.6	12.0	14.5	13.6	14.4
III. Animal names from real life and pictures and stories; also related terms.....	Number...	28	95	173	245	338
	Per cent...	27.4	15.2	17.7	17.8	19.3
IV. Vocabulary from nature: sky and landscape, plants and animals.....	Number...	34	148	298	412	561
	Per cent...	33.3	23.7	30.6	30.0	32.0

the whole vocabulary from nature—sky and landscape, flowers and animals.

All these figures are high in comparison to other children. The three animal vocabularies are very high at 18 months, drop somewhat at three, and then steadily increase in the following years. The number of words for animals and closely related terms were 95 at three, 173 at four, 245 at five and 338 at six.

This child learned nearly one-third of her nouns from nature, from sky and landscape, flowers and animals. The three year contribution is the lowest, slightly less than one-fourth. This is due to the comparatively few flowers she knew at three. Taking the vocabularies in the summers, of course gets the nature vocabulary at its largest.

At 18 months, one-half of her animal names came from books and pictures; at three years, one-tenth; at four years, one-seventh; at five, one-sixth; and at six, one-fifth. She has not many animal names from pictures and stories; there are 9, 8, 22, 34, and 50 respectively at the five ages. The emphasis has been rather on learning the life about her. She knew 36 names of insects when six years old, and 33 fish, amphibia and reptiles—all from real life. These last two kinds of animals have been rather a specialty of hers, as may be seen by noting the number of particular names in the five and six year vocabularies, as "leopard frog," "pickerel frog," "milk snake," "painted turtle," etc. At six years the related terms of the mammals show several quite general in nature and different from the "tail" of 18 months and "pet" of three years, as "male," "female," "pest," "prey."

The flower vocabulary is large and varied; she knew 80 plant terms at four, 103 at five and 142 at six.

Verbs. The child's development is plainly to be seen by a study of the verbs learned at the different ages. In each year there is an advance from the simple, fundamental words to those more complex and unusual. The intellectual stage of the three year old and the words that satisfy her are very different from that of the five and six year old with the fine distinctions she uses and the variety of actions she describes. That the earlier vocabularies contain the fundamental words is evident from an examination of the percentages of verbs learned each year that are not repeated in later years: 2 per cent of the three year verbs, 16 per cent of the new verbs at four and 38 per cent of the verbs learned at five.

Adjectives. The tables of different classes of adjectives, both numbers and percentages follow.

TABLE X
NUMBER OF ADJECTIVES

Age in years.....	1½	3	4	5	6
Article.....	0	1	1	2	2
Demonstrative.....	0	12	13	15	15
Interrogative.....	0	2	2	2	2
Quantitative.....	0	13	23	28	28
Qualitative.....	10	111	193	301	368
Color.....	0	15	22	29	34
Spatial.....	0	13	21	37	41
Sense.....	1	15	26	38	40
General.....	9	68	124	197	253
Total.....	10	139	232	348	415

TABLE XI
PERCENTAGES IN ADJECTIVES

Age in years.....	1½	3	4	5	6
Article.....	0	0.7	0.4	0.6	0.5
Demonstrative.....	0	8.7	5.6	4.2	3.6
Interrogative.....	0	1.4	0.8	0.6	0.5
Quantitative.....	0	9.4	9.9	8.1	6.6
Qualitative.....	100	79.8	83.3	86.5	88.8
Color.....	0	10.7	9.5	8.3	8.2
Spatial.....	0	9.4	9.1	10.6	9.8
Sense.....	10	10.7	11.2	10.9	9.5
General.....	90	49.0	53.5	56.7	61.3
Total.....	100	100	100	100	100

From three years on there is an increase in the proportion of qualitative adjectives, from 79.8 per cent at three to 88.8 per cent at four. Of the qualitative adjectives, color and sense decrease slightly, spatial adjectives fluctuate between 9.1 and 10.6 per cent, while the general adjectives increase from 49 per cent at three to 61.3 at four. An examination of the adjectives themselves shows that they begin with the simple and fundamental words and progress to the complex and unusual, evidencing the child's development in discrimination and power of expression. Of the three year adjectives in the general qualitative division, 7 per cent are not used in the following years; of the new adjectives at four years 21 per cent are dropped out and of the adjectives learned at five years 34.5 per cent.

At five, E. added more adjectives expressing size, shape and position than at any other year. At six she added only a few of these words and only two new sense adjectives.

At three, E. knew 11 color names and four related words;

at four, 16 color names and six related; at five 20 color names and nine related terms and at six, 22 color names and 11 related words. All the three year color words are repeated in all the following vocabularies; and all but one—"violet"—of the four year vocabulary. There were no new colors added at five years; the five color names all end in "ish." Three of these were not repeated at six. At six there were two new words ending in "ish" and three entirely new colors all of which are rather unusual—"bay," "burnt sienna" and "olive green."

Adverbs. The tables of the different divisions of adverbs, both numbers and percentages, follow.

TABLE XII
NUMBERS OF ADVERBS

Age in years.....	1½	3	4	5	6
Time.....	0	11	18	24	25
Place.....	3	23	35	49	51
Manner.....	0	12	22	52	53
Degree.....	1	11	20	25	28
Modal.....	2	5	7	8	9
Total.....	6	62	102	158	166

TABLE XIII
PERCENTAGES OF ADVERBS

Age in years.....	1½	3	4	5	6
Time.....	0	17.7	17.7	15.2	15.0
Place.....	50	37.1	34.4	31.0	30.7
Manner.....	0	19.4	21.3	33.0	32.0
Degree.....	33	17.7	19.7	15.8	16.9
Modal.....	17	8.1	6.9	5.0	5.4
Total.....	100	100	100	100	100

Adverbs of place are the second to appear in the vocabulary, the modal being the first; they are the largest division until the fifth year when adverbs of manner are a little larger. Time, place and modal adverbs gradually decrease throughout the vocabularies, while adverbs of degree are 17.7 per cent at three, 19.7 at four, 15.8 at five and 16.9 at six. Adverbs of manner increase from 19.4 at three, to 21.3 at four and then make a sudden rise at five to 33 per cent, dropping slightly at six to 32 per cent. Adverbs of manner increase 83 per cent from three to four, 232 per cent at five, but only 2 per cent at six. The increase of all the adverbs is 64.5 per cent at four, 55 at five and 5 per cent at six.

The Vocabulary at Five Years. Although in general the four, five and six year vocabularies are rather similar in character and general proportions of parts of speech and divisions among the nouns, adjectives and adverbs, still in many ways the vocabulary at five years seems unique. There was an increase in pronouns, prepositions and conjunctions that was not shown at four or six. Adjectives and adverbs increased tremendously—50 and 55 per cent respectively, while at six they increased only 19.2 and 5 per cent. Adverbs of manner increased 232 per cent at five and 2 per cent at six. There are nine epithets applied to animals,—a new development that year—four of which were dropped by six and no more were added. At five she used 27 new words denoting sounds and actions,—only two having been in the previous vocabularies—but at six she dropped 15 of these words and only added eleven.

It is difficult to find an explanation for these tendencies. For the two months before I began to collect her five year vocabulary, she had been exceedingly imaginative spending most of her mental energies on the marvelous doings of two animals she had invented. The other imaginative periods have occurred in the winter and were over and done with four or five months before her vocabularies were collected. When she came to Massachusetts, the new interests, the many people and the fascinating country made her quickly forget the imaginary animals. Is it possible that the great development of the imagination just before five and then its sudden diversion can be correlated with the above mentioned tendencies in language; the interest in adjectives and adverbs, in epithets and in words denoting sounds and actions, in short—in descriptive terms? It might be that although her thoughts were no longer imaginative yet her speech was still so to some extent.

The Understood Vocabulary. Feeling that no matter how faithfully I listened to my child's conversation, that I was not doing her justice in the matter of her six year old vocabulary, I tried to get some indication of the number of words she understood by using the dictionary. I asked her whether she knew what the words meant on 40 pages taken at random of Webster's Secondary School Dictionary, American Book Co. This was five per cent of the total number of pages. I wished to get more data, but she disliked so much being made a psychological subject, that it was only through much persuasion that I was enabled to examine her on 40 pages. I did not count any words that would have been excluded from the record of her spoken vocabulary, irregular parts of verbs, proper nouns, etc. She knew from two to 19 words

on a page, the average being 6.2. Since there were 790 pages in the dictionary, this would give 4,894 words as her vocabulary, both spoken and understood.

Of these 6.2 known words a page, 4.1 words were in her spoken vocabulary, while 2.1 were understood only. Multiplying 4.1 by the number of pages in the dictionary gives 3,239 words as her spoken vocabulary. The actual number I heard and recorded was 3,075 which is 164 less than the spoken vocabulary estimated from the dictionary. By the Binet test E's understood vocabulary at 6 years 9 months was 5,940 words—the 10 year level.

Comparison of the Size of Vocabularies. In the following tables of vocabularies of three, four, five and six year old children the size of the vocabulary as published is first given and then the vocabulary when counted according to Pelsma's, and Bateman's rules—i. e., no proper nouns and no variations of nouns, verbs or adjectives unless from different roots.

TABLE XIV
VOCABULARIES OF THREE-YEAR-OLD CHILDREN

Author	Sex	Vocabulary as published	Vocabulary reduced to lowest terms
Beyer, '16.....	Boy	2,055	1,807
Bush, '14.....	Girl	1,944	1,776
Brandenburg, '15.....	"	2,282	1,695
Boyd, '14.....	"	1,657	1,657
Heilig, '13.....	"	2,153	1,623
Whipple, '09.....	Boy	1,771	1,571
Gale, '02.....	Girl	1,176	1,176
Nice.....	"	1,139	1,139
Nice*.....	"	856	856
Bateman, '15.....	"	738	738
Pelsma, '10.....	"	681	681
Average of 11 vocabularies.....			1,338

*These vocabularies of my second daughter will be published shortly in detail.

The three year old vocabularies range from 681 to 1,807 words; the average of the eleven is 1,338. There seem to be six large vocabularies, two medium and three comparatively small. E. has one of the medium vocabularies, hers being 200 below the average. There are doubtless too many large vocabularies of children published to give us a fair idea of the average. What we need now are some small vocabularies.

There seem to be seven vocabularies of four year old children.

TABLE XV
VOCABULARIES OF FOUR-YEAR-OLD CHILDREN

Author	Sex	Vocabulary as published	Vocabulary reduced to lowest terms
Brandenburg, '16.....	Girl	3,061	2,777
Boyd, '14.....	"	2,598	2,598
Rowe, '13.....	Boy	2,346	2,064
Nice.....	Girl	1,765	1,765
Nice*.....	"	1,506	1,506
Pelsma, '10.....	"	1,278	1,278
Mateer, '08.....	Boy	1,020	922
Average of 7 vocabularies.....			1,843

At four the vocabularies range from 922 to 2,777; the average of the seven being 1,843. E. had almost as many words—1,765.

Only one five year vocabulary seems to have been published.

TABLE XVI
VOCABULARIES OF FIVE-YEAR-OLD CHILDREN

Author	Sex	Vocabulary as published	Vocabulary reduced to lowest terms
Langenbeck, '15.....	Girl	6,837	5,948
Nice.....	"	2,502	2,502
Average of 2 vocabularies.....			4,225

Elizabeth Langenbeck appears to have the largest child vocabulary that has ever been published. As one reads it over, it seems as if it would do credit to an adult; indeed probably few people use the number of color, form, tactual and sound terms that she does. The vocabulary was collected for six months and thus is larger than if it had been taken just before or after her birthday.

One six year vocabulary has been published.

TABLE XVII
VOCABULARIES OF SIX-YEAR-OLD CHILDREN

Author	Sex	Vocabulary as published	Vocabulary reduced to lowest terms
Rowe, '13.....	Boy	3,480	3,132
Nice.....	Girl	3,075	3,075
Average of 2 vocabularies.....			3,103

These two are nearly equal, their average being 3,103.

Sentences at Different Ages. E's first sentence was at the end of the 18th month: "Kiss fwog," (imperative). The next was at the beginning of the 19th month: "Betty kiss baby." From then till after two years her sentences increased in length and complexity, but they lacked connectives, such as conjunctions, prepositions, articles and the verb "to be."

- 21 months. Fish swim water. Flowers swim water too.
Home, Papa (in reference to a toad she found).
Baby catch crows. Baby feed hens corn.
Mamma wap door; Baby say, "Come in."
- 22 months. My toe peek out. My toe happy.
I see goat. Baby pick dannyions, give goat.
You get more, p'e (please), Papa dear.
No sanny (thank you) nauny keekaws (naughty mosquitoes) bite me any more.
- 2 years. The article "a" and forms of the verb "to be" began to appear.
P'e give me a needle, I sew a fine seam.
Is dat a mudder b'ue jay callin' her baby?
I runnin' 'ike a butterfly.
My bunny not dead. Bad flies are dead.
What dat hawk doin' wid dat baby? Dat baby don't like dat.

A Whole Day's Conversation. At various times from 33 months to 63 months I have taken down series of sentences ranging from 80 to an attempt at a whole day's conversation. The average number of words in these sentences varied from six to seven.

When E. was 63 months old, we tried to record a whole day's conversation but found it impossible to write fast enough to get down everything she said, so that one-sixth of the sentences had to be merely indicated. This was in the fall in Oklahoma when E. talked a great deal more than she did in Massachusetts. The total number of sentences said during the day was 1,702. The average number of words in the 1,394 recorded sentences was 6.17; therefore the total number of words used was approximately 10,500.

D. our second daughter, at 35 months used in one day 2,018 sentences or 7,600 words; the average number of words in a sentence being 3.77. E. at this same age had an average of 7.18 words to a sentence in a series of 100 consecutive sentences.

Brandenburg's ('15) daughter at three years used in one day 1,873 sentences or 11,628 words. The average number of words in a sentence was 6.6. This is much the same as E's record at 63 months.

Bell's ('03) daughter of three and a half used 15,230 words in one day, while his daughter of four years and eight months used 14,996.

Gale ('00) gives a number of records of whole day conversations of younger children. His boy at two years used 5,194 words in one day and 9,290 at two and a half. His youngest daughter used 8,214 words at 28 months and 8,996 at 31 months. Another boy used 10,507 words the day he was two years old, the same number that E. used at five years and three months.

Definitions. As already mentioned E. resents "foolish questions," the answers to which the inquirer already knows as well as she does. Therefore it was almost impossible to test her mental development by the convenient method of asking definitions. However one day when she was just three, she happened to be in a communicative mood and gave the following answers to the questions "What is a—?"

Father: Like a man who makes oxes work. Oxen work when they kill people.

Circus: Dey are c'owns in a circus.

Hat: Dat's my Papa's hat. He puts it on.

Bed: Dey make it up.

Automobile: We use it for to have; dat's just for to wun it, for Uncle Will to wun it.

House: Dat's for people to live in.

Window: Dat's for to have people look out.

Shoes: Dey are for to put on my 'dockin's.

Water: A 'pwing (spring) gets 'pwinged out of water. We get a dwink of water and then a wain comes down and we put a g'ass and we have such nice water on a nice sunny day.

Mother: Mudders have papers and faders have all nice sings for babies to p'ay wiz.

Meat: Dat's for people to eat. Ammal cwackers are for people when they get sick. I don't want to get dead. Wichard says, "I dead you." I don't want to get fought.

Cousin: Oh, dat's like Hawwis.

Bee: It's a 'tingin' bee what tings people.

Feet: I use them to walk.

When E. was six years and four months old I was asking her four year old sister to give definitions of these same words and others. E. seemed interested and occasionally was minded to express her opinion. I give here the remarks she volunteered.

Window: D. said, "To look in," but E. said, "I'd say a window was to keep the rain out and to look out too."

Shoes: D.—"To keep feet—to keep stockings warm." E.—"No, to keep them from getting cold."

Water: D.—"Is to drink." E.—"No, I don't call it to 'drink; it wasn't made to drink. I don't see how they made water. I don't see how things could make it."

Meat: D.—"To eat up." E.—"It's made to eat up."

Bathe: D.—"Means like to go swimmin'." E.—"I say go wading and swimming. You know frogs bathe a great deal of the time and fishes bathe all the time. Just sit in the water all the time. I think

that would be a rather tiresome way. If you'd get out of the water, you'd die."

Cousin: D.—"Made to play." E.—"I don't know what people are made for. I suppose to make the world better. And sometimes they make it worse. Spend some of their energy making it worse and some of their energy making it better. Think of their fighting! If there weren't any people, think how many passenger pigeons there would be. People who aren't any use! Isn't it a great sorrow!"

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EDUCATIONAL CONTROL OF NATIONAL SERVICE*

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We confront a world crisis. Immense and unprecedented national organization, the cumulative sweep of Russia's revolution, have cashiered countless social institutions. Isolated as yet from war, public schools still express such dead institutions. Unless educators "act quickly and wisely in connection with war-created forces, they will have passed the supreme opportunity of social service."

UNIVERSAL PHYSICAL TRAINING

Non-military measures of impressive educational value happily afford the most essential basis for military training. School control of "street and idle" time leaves a future citizen soldier physically fit, skillful, and familiar with teamplay. (1) Playing fields develop healthful activity in maximum air and sunlight. (2) Play activities liberate innate reflexes and thus habituate to certain reactions. Natural activity is adapted for orderly child growth; but more complicated series such as gymnastic plays, dancing, games and athletics, are taught. This advancing series ends with highly organized competitive games developing economy, accuracy and speed in essential neuro-muscular abilities, particularly emergency movements as running, jumping, throwing. These movements specialize and adjust to shifting exigencies in contests. Such habit formation is serious education, increasing skill. (3) Play utilizes the psychology of spontaneous gangs¹—natural leadership and social pressure—to create social attitudes. The future soldier learns group action through such processes as play-ground self-government, summer camps, boy scouts, organized teams, school associations. A suggestive range of organized team games is illustrated in Cleveland high schools, with 66 baseball teams, 205 basketball, 55 football, 20 soccer, 47 track

* This study draws freely from related literature. The extensive parallel advances in training and service of girls merit separate treatment.

¹Sheldon lists 1,196 spontaneous organizations among 2,508 children (8-17); Puffer, 128 of 146 Lyman School boys (11-16) members of gangs; Scott, 69% of 490 boys (11-16). Sheldon finds 61% of 851 gang members in athletics, 17% migrating, building, hunting, fighting and preying (activities allied to war).

and field, 12 indoor athletic, 9 indoor baseball, 3 swimming and 19 tennis teams (1915). The satisfaction in social and combative impulses increases with public applause. The educational value of these important pre-military activities is clear.

With universal physical training all schools must organize educational play. There are in 414 cities, 3,270 supervised playgrounds as cadres from which to develop adequate playgrounds. State-wide machinery would arrive automatically were schools equipped as neighborhood recreation centers.² By 1915, 133 cities had opened 612 school houses as evening recreation centers, in contrast with 56 cities having special recreation buildings.³ School gymnasias influence probably less than 5 per cent. Pools represent maximum use of small area, and 306 are reported by 139 cities.⁴ Flooded spaces (in northern states) offer winter skating rinks.⁵ Detached playgrounds may surround a school plant at adequate distances, supplemented in turn by playing-field and park system. Among 496 smaller cities, 36 per cent report school grounds larger than 2 acres, reaching even 20 acres at Gary or Joliet. Dresslar (1914) finds 42 per cent of 1,245 rural schools with at least one acre.⁶ To freely express (for 1,000 high-school pupils) the traditional games, Curtis estimates a playing field of 8 acres (minimum, 5 acres).

Maximum use of these facilities to minimize equipment and avoid congestion, requires nearly uniform attendance at all hours. A lengthened school day and electric lighting allow the plant to operate twelve hours.⁷ Some flexible systems house duplicate organizations in one set of school accommodations: relays in academic or other work, with parallel relays at play.⁸ Curtis estimates this device would warrant at least 50,000 specialized play teachers. Supervised playgrounds employ 7,500 summer workers but are reduced to 14 per cent of this force for the year-round.⁹

The municipality administers playgrounds in about 58

² Cf. National Community Center Conference and National Federation of Settlements.

³ Thus Cleveland operates 16 school centers; Chicago playgrounds, 20 field houses.

⁴ 188 cities report swimming activities (1915). Swimming is a superior exercise for fundamental muscle groups.

⁵ 88 cities report skating activities (1915).

⁶ North Dakota therefore authorizes 2-5 acres.

⁷ 129 cities report 524 playgrounds lighted evenings.

⁸ As the Gary "balanced load," Cleveland "platoon" or Dallas "overlapping" plans.

⁹ To supplement schools of physical education, some 70 cities train their workers; 35 require civil service classification (1915).

per cent of the cities. A centralized and powerful recreation commission controls Detroit's play centers (whether school or park property). Oshkosh (Wis.) has correlated its recreation department with the school board. The extensive social centers of Milwaukee are under exclusive school rule. At least 70 school boards exercise similar supervision.¹⁰ Playground associations are active in some 114 cities. A limited field force represents the Playground and Recreation Association of America.¹¹

Without compulsory physical training, school athletics will continue to reach a mere fraction from among the best-developed. Physical requirements for citizen soldiery will clearly reveal the educational absurdity of a fractional system¹² and sharply criticise physical defects. Athletics involve the examination and classification of each boy, implying an immense extension of school medical inspection. Training requires special supervision to avoid unbalanced specialization, over-indulgence, or unsocial play. The public athletic leagues in 177 cities illustrate this control. The Public Schools Athletic League of New York as a model, promotes standard athletic badge tests. Crampton (1915) mentioned 163 school playgrounds open for after-school athletics, 40,000 boys practising daily. Similarly, compulsory athletics of Boston high schools include running, jumping, throwing, chinning and swimming tests for each year. Such educational athletics are extensive, schools or classes competing as units for superior averages.

The problem is badly complicated by the rural factor, embracing 59 per cent of all school children. Rural schools, local granges or even churches, will afford facilities. A special school director can organize the county's athletics (as in

¹⁰ 67 cities by recreation departments or commissions, or 31 by park boards; associated school boards, 17. The ratio of cities using municipal or private funds or both is 182 to 112 to 130 (1915).

¹¹ Cf. American Physical Education Association.

¹² In Cleveland high schools, 74% of the boys do not play organized ball; 36% basketball, nor 55% football. Among elementary boys (over 10), 78% do not play football, nor 80% basketball, nor 17% baseball. Listing elementary boys (over 8), perhaps 1 in 4 goes camping; 9 in 20 hike; rare riding experiences involve motor cycle for 1, horse 4, and cycle 7 in 22; for each boy shooting, 2 do not (in high schools, 2 to 9); hardly 55% swim (65%, high schools); three-fifths skate; three-fifths wrestle; only half box (1915-Survey).

The New York City committee on recreation finds 734,402 children (under 15) who must seek recreation outside their homes, and school or park playgrounds with an average daily attendance from 25% in summer to less than 14% in winter.

The total daily playground attendance in 389 cities was 814,108 (July and August); in 90 cities, 200,478 (winter).

Hamilton, Tenn.).¹³ County athletics properly culminate in county school fairs (Virginia) or rural play-festivals (as at Amenia, N. Y.). Fresno County (Cal.) entered 1,800 boys from 40 schools in athletic tests, for average scores. The Public Athletic League of Baltimore through state appropriation, is extending track and field events to the counties and will standardize state-wide athletics. County administration (with state supervision) and consolidation of schools, are essential.¹⁴

Fortunately, New York is experimenting with compulsory state-wide physical education, as a model for state legislation. Control involves the state board of regents, a state physical training director with staff, and appointment of some 600 physical training instructors. The state requires a weekly minimum (100 minutes) of school children; and contributes half the salary (\$600) for special instructors. High-school teachers provide two-minute setting-up drills with daily class inspection; the special instructors, four hours in organized play,¹⁵ plus 60 minutes gymnastic drills or marching.¹⁶ State-wide physical education includes medical inspection, individual health habits and recreational activities. Clearly less-adapted and wavering state programs should be integrated into a standard system, enforced directly by legislation.¹⁷

BOY SCOUTS AND MILITARY CADETS

Among all organized non-military activities for boys, within or without the school, but one has proved itself pre-eminently adapted to national emergency—the Boy Scouts of America. This organization should therefore at once be promoted to an integral and prominent part of junior (and senior) high-school activities. It is only necessary to recall the aid of scouts to Ohio flood sufferers (1913), in fighting forest fire (Montana)

¹³ County agents and 89 Y. M. C. A. rural secretaries tend to associate boys' work with athletics (1915).

¹⁴ Cf. the state recreation commission (California). State control by recreation laws (28 states) as yet chiefly ensures urban home rule.

¹⁵ 3 hours may be satisfied by home or community recreation equivalents.

¹⁶ Cf. physical training in the Swiss schools under federal supervision: all boys at 8 years, 2 hours weekly; at 15 years, 1 hour daily (frequent military exercises without arms). Cf. in Australia, compulsory junior cadets (12-13) receiving daily physical training (15 minutes); marching; miniature rifle shooting, swimming, running games or first aid (120 hours per year).

¹⁷ Cf. the recent Illinois physical education law requiring a minimum of one hour weekly in all grades. Cf. Maryland, Massachusetts, New Jersey (1916) commissions on physical training with reference to military efficiency. The latter commissions recommend compulsory physical training in all schools.

or at the Salem fire (1914), in campaigns against unemployment (Cleveland) or for state forest conservation (New York); or their year-record of 6,020 distinctive services to the community and 2,558 acts of practical aid (such as 228 rescues from drowning). The scout motto is Be Prepared. In the first five months of war, over 5,000 war service badges were awarded English scouts serving three hours daily 28 days without reward. Over 50,000 scouts served in government offices, police stations, hospitals and relief associations. No other non-military activity so includes the essential principles of the citizen soldier.

Membership is open to *all* boys but reaches about 200,000. Under the national council are 350 chartered councils, each with an active scout commissioner.¹⁸ Leadership is voluntary, but of 7,067 scout masters, 65 per cent are college men (1916). The gang is systematized as a uniformed patrol, 8 boys including a leader and assistant; a troop consists of 2-4 scout patrols.¹⁹ Local churches, settlements, schools, playgrounds provide for weekly assembly. Troop meetings are partly social, partly educational, and follow orderly procedures.

A boy advances from tenderfoot through second-class to first-class scout. Essential tests include (tenderfoot) scout law, knot-tying; (second order) various outdoor arts as tracking, compass reading, use of knife, fire building; (first order) a seven-mile trip alone, map reading, distance judging, signaling, advanced camp cooking, advanced first aid, training a young boy as tenderfoot. Local councils have summer camps.²⁰ These activities incidental to hiking, exploration and camping, are equally essential to citizen infantry.

The first-class scout is then eligible to merit badges in 58 different activities. Thus the merit badge for public health includes 9 tests (such as planning the sanitary care of a camp). Among 14,254 merit badges awarded (1916), were 1,191 for swimming; 1,059, personal health; 985, public health; 882, first aid; 493, pathfinding; 459, life-saving; 451, cooking; 404, pioneering; 397, camping; 299, athletics; 232, signaling; 111, automobiling; 101, marksmanship; 39, horsemanship; 36, surveying; or 17, aviation. Such activities bringing practical health and skill, afford the fittest pre-military experiences.

Scout values are educationally desirable from many points

¹⁸ Cf. the independent Rhode Island scout organization.

¹⁹ Cf. the infantry squad, platoon or company.

²⁰ About 100 camps (1915). Several councils have small cruising boats. The division of 5-8 boys includes boatswain's mate and coxswain; three divisions, a ship's company. The scout rises from apprentice through ordinary to able seaman, by swimming, rowing, knot tying, boxing the compass, chart reading, steering, look-out duty and like tests.

of view. For vocational guidance, merit badge tests invite pre-vocational experiences. Useful elective tasks include 704 badges awarded craftsmanship, 605 carpentry, 262 electricity, or 205 machinery. Continuation schools may utilize merit badges to motivate efficiency of working boys.

Adolescent ideals—sublimated in public service and daily good turns—act “adroitly, by a thousand specific habits, to anchor a boy to modes of right living.” Scouts give concrete expression (as Russell suggests) to a remarkable code of honor, couched in positive terms from the round of every boy’s life.²⁰

Scoutcraft is adapted to all degrees of ability. Scout advance implies the progressive organization of higher habits through interesting, self-imposed tasks. Motivation is maximum, reward following success. Electives as Snedden suggests, are short, concrete units (“self-carrying” activities), so that learning processes are endlessly cumulative. To Dean Russell, the scout movement is “the most significant educational contribution of our time.”²¹

Its activities are more valuable to the nation than much in the present curriculum. Yet scout troops are left to unsalaried teachers lacking time or training.²² Even in rural sections (so favorable to hiking and camping), it is well-nigh impossible to organize (as Curtis points out) through lack of leadership. “The order can never come into its own until it becomes part of the public school work and is required of all boys.”

As initial steps toward integration, 790 public school teachers are scout masters and school superintendents are on executive boards of nearly all chartered councils. In 1915, teachers certified the school records of 381 boys as satisfactory for scholarship badges. At Waco (Tex.) the superintendent requested scouts to attend school in uniform. Paris (Ill.) has placed a troop in every school, with credit for scout achievement. The University of Texas awards scholarships to eagle scouts.

From over 6 million boys (12-17) may be withdrawn those now 17, delinquents, workers supporting dependents or in isolated rural sections. Under the national system of service, membership of all other boys in school scout troops should be compulsory, by state or federal law if necessary. Pur-

²⁰ Cf. similar achievements of the Junior Police (as in the Bridgham School, Providence).

²¹ Russell, J. E. *Scouting Education*. Teachers College Record, January, 1917. pp. 1-13.

²² Scout training courses have appeared at 7 universities (Boston, California, Columbia, Pittsburgh, Texas, Virginia, Wisconsin).

chase of uniforms warrants state or federal aid.²³ Scout troops should then be inspected as to efficiency either by the federal War Department or Bureau of Education.²⁴

The present inevitable mobilization of high-school cadets should develop a more comprehensive system of physical and civic education. Quickened by the war, 14,481 boys (53 per cent) drilled in 119 public high schools (1915). Cadets frequently waste their motivation in questionable repetitions of the manual of arms and useless close-order parades. As Ayres suggests, these drills are expensive (uniform and rifle) and without vocational value. A consensus of educational and military opinion sees little value in such tactics for early adolescence.

High-school battalions of Boston, Washington, Salt Lake City, Omaha or Fort Worth, enjoy a definite place in their educational systems. Crack cadet corps, adequately equipped and officered, may embody effective national service. Their uniforms stand for playing the game. Cadet training is consummated in the 27 special military preparatory schools.²⁵ At Culver Academy under an effective military staff, cadet officers are selected for efficient leadership. Cadets practise in the field, with skirmish runs, week-end hikes, rides and camping trips. An athletic emblem rewards set-up and physical fitness.²⁶ Cadets with mechanical interests profit from drills with a modern battery (range finders, telephonic system, intricate guns and carriages); drill with a field wireless detachment; or an instructive company of engineers, building spar and pontoon bridges. The New York State bureau of technical military training (\$150,000) is authorized to enforce three hours military training for all boys (16-18 years).²⁷

²³ Cf. Wyoming's aid to cadets. Uniforms at cost from the federal quartermaster's department would prove useful.

²⁴ Young, E. *The Boy Scout Movement*. Quarterly Review. Vol. 225, 1916. pp. 400-15.

²⁵ Gignilliat, L. R. *Arms and the Boy*. Bobbs-Merrill, Indianapolis, 1916. 371 pp.

²⁶ Cf. American Posture League (New York).

²⁷ Louisiana (1916) authorized military instruction in high schools (minimum, 1 hour weekly). California awarded the State High-School Cadets (25 companies), \$13,000 state aid (1915).

Cf. recent bills including compulsory physical training in elementary with military training in high schools (Delaware, Michigan, Missouri), or universal physical training but local option on military training (New Jersey).

Cf. in Australia, compulsory senior cadets (14-17), with at least 64 hours a year in physical training, drills with or without cadet rifles, and range practise.

Cf. voluntary preparatory courses (military exercises, light tactical problems, extensive rifle shooting) for Swiss boys out of school (16-19).

Voluntary enrollment has itself assumed significant proportions in our public high schools.²⁸

As a rule, military cadets are actually inferior in efficiency to boy scouts. Since the newer high-school companies commonly follow close order drills and manuals, thus failing to meet modern conditions, they should be restricted to senior high schools and attached to boy scout organizations. Attached cadet troops could specialize in educational scout activities such as rough map sketching, engineering, signaling, first aid and sanitation. The scout is not a soldier, but in his non-military activities he is practising the fundamentals of infantry work (caring for himself in the field, marching and shooting). Sea-scouting affords similar pre-naval experiences.

Use of army rifles should depend on physiological age, and be generally discouraged for immature boys. In view of the educational value to the Swiss of rifle shooting as their national sport, the merit badge for marksmanship should be required of scouts 16-18.²⁹ At this age Swiss boys begin record shooting, and some 13,000 are rifle-club members (1914). As a rifle club, the cadet troop may enjoy co-operation with the National Rifle Association of America. Clubs may draw rifles (on bond) from the War Department; which also issues old rifles and target ammunition to uniformed and instructed cadets (40).³⁰ The New York Public Schools Athletic League has 26 sub-target gun machines. Among 5,000 shooting, 606 qualified for marksmen's badges, 385 as sharpshooters (1916), and may use armory galleries. The League has organized a field day at the state rifle range, Peekskill. Salt Lake City schools possess two complete rifle galleries. Washington cadets enjoy outdoor shooting on the ranges for 6 weeks (March-April), followed by field firing competition between platoons, inter-high competition between marksmanship platoons, and closing with competitive field firing for the championship (1916). California cadets compete on state ranges,

²⁸ In New York City at least 2,500 students are drilling under national guard officers in 17 high-school organizations (March). The guard cooperates with free use of armories, even rifles, and work includes minor tactics, target practice, signalling, first aid and sanitation. Chicago has ordered rifles and "pup" tents for 3,000 cadets.

²⁹ Cf. the junior marksman's lapel button issued boys by the Rifle Association (Washington). Gignilliat suggests cadet shooting be effective "safety-first" instruction, boys receiving cartridges only on the range, in position to shoot, faced toward the target, and at the finish withdrawing the bolt.

³⁰ Australia supplies over 40,000 school boys with free arms, munition and instruction. New Zealand builds miniature rifle ranges in its schools and issues rifles, ammunition and instructors.

inspected by national guard officers. The National Association arranges school shoots.³¹

Programs may be greatly enriched by military athletics. This extension is the remarkable Wyoming plan of pre-military training.³² Steever is adapting routine military training to a series of national defense games, involving strenuous competition within and between high schools. Honors include uniform-stars, medals, team trophies and school credit. Elective units are equalized (through the state office) by choosing the personnel in turn. There are no officers, only leaders of the competition units, such as wall-scaling, infantry-drill, troop leadership, field-firing, camp-and-field, or scholarship units. The school year is divided into short training periods to maintain interest and educational efficiency. The complete plan involves 14 days in summer camp at the close of school, and includes training in cooking, sanitation, simple field engineering, scouting and patrolling. Such games supplement the great traditional games.

The health values inherent in camping, hitherto limited to sons of the wealthy, warrant such camps as an integral part of an educational system. Curtis estimates less than 1 per cent of all boys are reached.³³ The Denver association through camping hikes in a chain of mountain parks, has taught boys to pitch tents and cook.³⁴ The Los Angeles camp on government mountain land includes supervised camp fires, forest hikes, organized athletics and swimming. Military experiences should be largely limited to summer training camps. Continuous outdoor work is basic. At large-scale training camps, all boys learn by caring for themselves and equipment, marching, deploying over difficult ground, shooting, sharing field maneuvers. Boys demonstrate by actual participation the elements of modern organization and team work. The emotional accompaniments foster patriotic attitudes. The Massachusetts commission recommends one month at camp before or after the 12th grade. Snedden suggests much physical and some military training for boys aged 16-18 in voluntary (later compulsory) camps.

Official demonstration of the newer pre-military training was given by U. S. Army officers at the Fort Terry training camp (1916). Modelled after the remarkable Plattsburg

³¹ As the Astor Cup Match and National Trophy for both military school and public high-school teams.

³² The High School Volunteers of the U. S. claim nearly 30,000 boys under the Wyoming plan (*Everybody's*).

³³ 62 cities report camping activities (1915).

³⁴ School hikes are easily organized; 164 cities report some tramping activities. Shelter tent outfits are inexpensive.

camps, though much less intensive, 1,200 boys for 5 weeks lived in army tents and deployed in the open air. At least 7 junior training camps (15-17 years) were planned by the War Department (1917).³⁵ The New York commission plans outdoor development in after-school hours with field training (2-4 weeks) under national guard auspices. Cadet troops may utilize county fair and state drill grounds. At Culver Academy, two summer camps have trained over 700 boys appointed from high schools of the Middle West. In the (1915) camp, 200 selected Indiana boys practised first aid and sanitation, tent pitching, trench making, signaling, skirmish runs, practice march and field problem.³⁶ The Wyoming plan is also illustrated at Cheyenne. High-school cadets hike to a summer mountain camp (10-14 days), adding to military maneuvers (including a sham night battle), fishing, hunting, mountain climbing. The National School Camp Association (New York) endeavors to maintain summer camps at minimum cost.³⁷ About 1,000 boys (average 13.5 years) received training at Ft. Hamilton from 2-12 weeks (1916). These military camps substitute definite training for idle street play.³⁸ Constructive school programs should reach all boys with summer training camps, military athletics and boy scout troops.

CONTINUATION SCHOOL CONTROL

Translated in school terms, nation-wide mobilization means school control over *all* the nation's boys. Educational accounting must terminate its present surprising inefficiency. At the eighth grade, schoolmen actually lose contact with the majority of future reservists.

A state board of education (Connecticut) may enforce either child labor law or compulsory attendance. Control becomes effective when the employed child reports monthly (Michigan) and at discharge, his employer returns his specific work certificate to the issuing office.³⁹ The federal child labor law also stimulates universal education with national support. Upon this 14-year minimum the National Child Labor Committee can erect a more suitable employment limit, since skilled

³⁵ Cf. the Junior Naval Reserve Corps affording boys pre-naval experiences (equally useful for the merchant marine) at training camps, such as Camp Dewey (New London).

³⁶ The other 10 honor military schools afford a similar nucleus for assistant training-camp instructors.

³⁷ Expenses for 2 months, \$24 (including uniform, dues, subsistence).

³⁸ Training may be other than military. Cf. summer farm camps (page 256).

³⁹ California, Connecticut, Maryland, Massachusetts, Pennsylvania.

trades have no room for immature boys (14-16). Physiological age best expresses this child labor formula.

Educational oversight alone insures that all juvenile employment contributes to the child's educative process. Boys in part-time systems (as Cincinnati or Fitchburg) remain under supervision while earning a wage. Part-time high schools place their pupils in commercial shops for alternate two-weeks, weeks or half-days, and retain close co-ordination.⁴⁰ Manufacturing corporations install similar apprentice schools. As distributing centers between school and industry, corporation schools offer advanced means of control.

Part-time and continuation systems allow control of all employed boys. At Boston, compulsory classes reach juvenile workers (under 16) four hours per week.⁴¹ Pennsylvania supports state-wide compulsory continuation schools (14 to 16). Wisconsin requires working boys (16 years) to attend four hours weekly, for 8 months. These follow-up systems should extend school contacts to 18 years. They control under educational management retarded and eliminated children. Federal funds should stimulate continuation schools in a majority of states.⁴²

Vocational schools should derive immediate advantage from the great industrial mobilization now in process.⁴³ National organization implies (1) inventories of establishments as a rough basis for control; (2) minimum annual educational orders to prepare industries for service; (3) enrollment of skilled labor in an "industrial reserve." Equipment and industrial production are more difficult processes than training an army. Since industrial schools enjoy federal aid, their enrollments should be recognized. Vocational training in useful (war) industries should count as industrial service. Trade agreements with munitions industries, should warrant support from the federal board of vocational education. The halting character of the Smith-Hughes Act is most clearly offset in the New York legislation.

This advanced (New York) law suggests fuller federal and state "participation in the formative processes of our national life." Under a state bureau, boys (16-18) may substitute useful vocational experiences for required military

⁴⁰ An all-year school might divide into quarters, evenly distributing one-fourth its boys in commercial shops.

⁴¹ Cf. the extensive Chicago or Cincinnati systems.

⁴² Smith-Hughes Act reaches 7 millions (1925), with equal state funds.

⁴³ The Council of National Defense employs an advisory council of seven leaders in transportation, labor, munitions, supplies, raw materials, medicine, research. Cf. its munitions board with 5 industrial, 15 military and naval specialists.

training.⁴⁴ Such a law should promote day part-time and continuation and evening trade schools; anticipate army exemptions for industrial service; and create a mechanism for sifting over vocational experiences.⁴⁵ By branding as useless many unskilled occupations outside industrial preparedness, the bureau has a tremendous offensive weapon against industries without educative value. A premium is actually placed on entrance into skilled vocations.⁴⁶ Dean cautions assembly at intervals lest the boys learn skilled trades for ends other than national service.

Agricultural mobilization for war food production presents a third division in educative service. Small-scale production (within urban areas) is furthered by the School Garden Association of America, or the school and home gardening division, Bureau of Education. According to Randall, 78 per cent among 1,572 city superintendents report some form of school-directed gardens, even special departments.⁴⁷ A possible standard portions 1 all-year garden teacher with 200 children. Their large leisure readily allows children to raise vegetables (for profits) on small home areas.

By co-operative agreement with state colleges, the federal States Relations Service extends agricultural education through 1,200 county agents (1916). The Smith-Lever Act to which all states have assented, brings generous federal subsidy. A county superintendent of education may act as the county agent. Thus in Cook County (Ill.), the superintendent has 5 "country-life directors" to supervise home projects as part of the regular school work. Similarly of 330 county agents, 68 per cent are co-operating with the schools. Rural high schools should reorganize with part-time agricultural home-project courses (simple vegetable or poultry to complex dairy and fruit projects). Some 337 high schools report home projects. Their expert instructors may connect up junior pro-

⁴⁴ "Vocational training or vocational experience as will, in the opinion of the commission, specifically prepare boys of the ages named for service useful to the state, in the maintenance of defense, in the promotion of public safety, in the conservation and development of the state's resources, or in the construction and maintenance of public improvements."

⁴⁵ Dean, A. D. *Tools as Well as Guns*. Survey. Vol. 38, 1917. pp. 35-6.

⁴⁶ "It is clear that industries dealing with metals, machinery and conveyances (for example, manufacturing implements and tools, sheet-iron work, forging, structural iron work, rolling-mill work, firearms, railway equipment, engines and boilers, electrical apparatus, boats and boat-building and agricultural machinery) are in the class which is directly useful in the maintenance of defense." (Dean.)

⁴⁷ 140 cities average separate appropriations over \$900. 220 cities report voluntary funds.

ject work in surrounding ungraded schools. In 33 northern and western states (1915), 209,178 boys and girls shared in club projects, 61 per cent under guidance of teachers, 12 per cent in profit-sharing enterprises. Corn clubs of the South number 62,922 boys, averaging 51.4 bushels per acre. The Bureau of Animal Industry co-operates for pig, poultry or baby beef clubs.

School credit for farm work under educational control is not limited to club projects. In Chicago, 6,000 high-school boys (over 16) pledged to work at food-supply, are reported released (April) with full credit for the remainder of the school year. Among boy scouts available for troop gardens, every Rhode Island scout may enlist in war food production service, growing a staple food during his enlistment and receiving a certificate from the governor.⁴⁷ For effective supervision over transportation, feeding, housing, the National Child Labor Committee suggests scout camps in given farm districts or similar camps under playground, probation or school officers. The civil-military service plan would enlist (under pay) boys 14-16 for food production, with intensive camp farms under agricultural leadership and military discipline. In lieu of military training the New York Commission will accept farming. Mobilization of boys (15-18) as active farm workers for the summer is under the Department of Labor. The director (Hall) of this U. S. Boys' Working Reserve (Washington) was called from the Boys' Club Federation. The Reserve is organized in supervised squads with adequate equipment for camping on farms. Accepted standards of child labor legislation should be strictly maintained.⁴⁸

NATIONAL SERVICE

Educational re-organization will properly culminate in national service.⁴⁹ Various boys are serving in munition industries or agriculture. All other youth should devote one year to national service in any line of work (other than clerical) promoted by the Government, such as forestry, agriculture, engineering projects or army. Into this era of national service (extension of compulsory education) the public schools should lead. Local economies (at Gary) in practical work for the

⁴⁷ Cf. the Farm Boy Cavaliers of America (Minnesota, Wisconsin, Louisiana).

⁴⁸ With special work permits by proper officials, including physical examination and issue only for farms known to be suitable. Cf. the unfortunate authorization by the Pennsylvania board of education for withdrawal from school of children 12-13 to work on farms. The place for such children is in supervised home gardens.

⁴⁹ At nineteen years: with sufficient option that the training may come at a desirable stage in the individual's development.

school plant as prevocational experiences, apply on a large-scale to national improvements. Continuation and part-time machinery, at little cost, would render some successful vocational learning essential to all boys. Finley would employ "organized national enterprise" in which the individual undergoes continuation training as service.⁵⁰ As a logical outgrowth of public schools, Bourne suggests children spend two years in constructive service, with athletics, wide travel, training in vocational rudiments.⁵¹ He asks for a new type of teacher-engineer-community worker.⁵² A year's service in national projects implies some form of National University for "systematic co-operation" between federal bureaus as mechanisms of part-time experiences.⁵³ The Bureau of Education should be "something more than a book-keeping and essay-writing department."⁵⁴

National activities as educative experiences open immense vistas in learning by doing. Their richness in situations real with reference to social use, guarantees effective habits. Boys are readily "captured for the observation and execution of industrial and commercial processes. The industries growing out of the fundamental needs of food, clothing and shelter; the industries, occupations and apparatus involved in transportation and communication—all furnish practically unlimited openings for constructive experiences. . . ." These experiences not only offer "a clearer understanding of the social and industrial foundations of life, but also opportunities for expression and achievement in terms natural to adolescence."⁵⁵ James suggests a constructive army of youth for

⁵⁰ Finley, J. H. *Education and Preparation for War*. Proceedings, National Education Association, 1915. pp. 344-50.

⁵¹ Bourne would have constructive service organized and administered by state educational administrations but supervised and subsidized by the national government. This dual control might repeat the weakness of the federalized militia (state appointment of officers and authority for training). At the Mexican crisis, but 50% the war strength appeared, 63% of even this force untrained men. Universal military training implies exclusive federal control.

⁵² Bourne, R. *A Moral Equivalent for Universal Military Service*. New Republic. Vol. 7, 1916. pp. 217-9.

⁵³ The University as a general staff or planning department should apply approved educational devices (from scientific industrial management) to large-scale national projects. Cf. the Advisory Committee of the Council for National Defense, as a general mobilization staff. Cf. staff of the army engineer corps. Cf. a unified federal office of public works with civilian corps of engineers.

⁵⁴ Dewey, J. *Universal Service as Education*. New Republic. Vol. 6, 1916. pp. 309-10, 334-5.

⁵⁵ Flexner, A. *A Modern School*. Occasional Papers No. 3. General Education Board (New York). 1916. 23 pp.

Cf. constructive service as the culmination of the new experimental school subsidized by the General Education Board.

industrial control of nature.⁵⁶ The boy (so conditioned) organizes his own essential knowledge.

Our great department of agriculture alone includes the office of public roads and rural engineering; our national forest service; bureau of biological survey enforcing game laws; bureau of animal industry studying or inspecting animals and meat food products; parallel bureau of plant industry; office of farm management improving practice; states relations service extending agricultural education by county agents and experiment stations; bureau of crop estimates collecting reports; weather bureau; or magnificent laboratories (bureau of chemistry) analyzing agricultural products, foods, drugs. War food production includes mobilization of skilled agricultural labor. Civil-military service could involve enlistment for model farm camps and assignments to farms now organized. Lane advocates a war-maintenance corps of labor for irrigated lands, with farmers organized about its mobile machinery.

The department of commerce' bureau of fisheries propagates food fishes, cares for Alaskan salmon or Pribilof Islands seals, studies deep-sea fishing grounds; the coast and geodetic survey, precise coast measurements; the bureau of lighthouses, protective coast signals; the bureau of standards owns exceptional laboratories. The treasury department includes our coast guard service, public health service, construction of public buildings, engraving and printing experiences. The department of the interior administers our national parks; the extensive field service of the geological survey; bureau of mines; or reclamation service developing national irrigation projects in arid states. Precisely the more striking fields of national service involve permanent improvements as trunk roads, Alaskan railways, harbor terminals, canals (the Atlantic coastwise canal), electric power-plants and protective forms of flood-control (notably the Mississippi and Ohio River improvements), or drainage of great swamp areas.⁵⁷ These engineering projects are widely distributed, in the army engineer corps, office of public roads or the reclamation service.

Educators overlook the wealth of possible vocational experiences under war and navy departments. Army engineers now control river and harbor developments.⁵⁸ Modern war ex-

⁵⁶ James, W. *The Moral Equivalent of War*. American Association for International Conciliation (New York). No. 27, 1910. 20 pp.

⁵⁷ With national service staff and skeleton forces, national projects might rapidly absorb surplus labor during depression, thus restoring confidence.

⁵⁸ As the St. Johns Drainage District (Fla.), Little River Drainage District (Mo.), Miami Conservancy District (O.).

Traver suggests "on a large scale the method found so successful in building the great Panama Canal, namely, place the great reclama-

pands their functions. Deployment at great depth sheltered from modern heavy guns and aircraft observation, requires an immense construction of field fortifications, by technical skill and tools. Engineering experiences involve surveying, bridging streams, building networks of military roads and railways behind entrenched lines. Huge government munitions plants should afford educative experiences (as mechanical or electrical workers or in explosive plants as chemists), modeled after corporation schools. The navy department has bureaus of ordnance, machinery, construction and repair of ships, yards and docks.⁵⁹ Naval officers are increasingly master mechanics and sailors are taught useful trades.⁶⁰ Enlisted specialists of the coast artillery include electricians, engineers of power plants (steam, oil, gasoline), surveyors and draftsmen for the coast defense. The army signal corps is a ready training school for mechanics, electricians, photographers, aeronautical experts. The corps has built high-power radio stations, and constructed the commercial cable to Alaska. Its radio companies are trained to use wireless equipment; wire and outpost companies as telegraph and telephone operators; telegraph battalions to install semi-permanent lines. The immense development of aero squadrons requires aviation schools teaching the flying, maintenance and repair of aeroplanes. As every army organization is self-sustaining, mechanics, carpenters, blacksmiths, saddlers, teamsters, cooks and bakers, make up a necessary part of the personnel. The quartermaster's corps afford experiences with transportation companies on transports and docks, with motor truck companies, and commercial experiences. The medical corps offers experiences in camp sanitation and care of men in the field. Sanitary achievements at Havana (1901) or the Panama Canal (1904) demonstrate its public health work. In fact, these departments furnish extraordinary service in emergency.

The National Society for the Promotion of Industrial Education has assisted a tendency in the professional army to pay young men wages while learning their trade. The secretary of war (1916) was authorized to increase opportunities for vocational training in agriculture or mechanic arts to soldiers

tion projects, the great road building schemes, the great Mississippi River Improvement and other great and much needed public works under the control of the U. S. Army Engineers." Cf. an office of public works.

⁵⁹ Cf. the mercantile fleet planned by the federal shipping board.

⁶⁰ Special trade schools in the navy service include machinist school (for re-enlisted men), electrical schools (general and radio), artificer school (plumbers and fitters, blacksmiths, carpenters, painters), hospital-corps schools (pharmacy and nursing) or commissary schools (cooks and bakers).

in service preparatory to leaving; and civilian teachers may aid.⁶¹ Traver has suggested an army trained in outdoor labor (earth work, concrete construction or operating machinery) on great national projects under army engineers, instructed in effective co-operation and camp sanitation, preparing each individual for normal processes.⁶² Organized units with equipment, would shift from project to project.⁶³ Special continuation classes as in hygiene, geography or elementary engineering, would reinforce these useful experiences.⁶⁴ Traver would add 5-hours weekly drill, with a possible 3-months intensive military training. Quick proposes the conversion of army posts into great army schools, operating with reference to nation-wide educational and industrial needs.⁶⁵ One-year enlistments (16-35 years) by forcing competition with civilian life, insure educational efficiency.⁶⁶ The Post plan would relate four-years enlistment to our social system by limiting military training to 12, 2, 1.5 and 1 month, reserving nearly three years for vocational training (in government shops).⁶⁷ Mahin also suggests an "industrial militarism" which will leave enlisted men efficient industrial units.

Universal service should present a level from which to measure educational systems on a national scale.⁶⁸ This gauge is "in terms of life out of school."⁶⁹ With performance of life acts a rough measure of individual abilities, service tests should

⁶¹ Fisher suggests military life be made attractive through vocational training, increased pay, shorter enlistments, and withdrawal of officer-caste system.

⁶² Traver, H. G. *Invincible America, A Plan of Constructive Defence*. Society of Constructive Defence (New York). 15 pp.

⁶³ Among 533 applicants for service in such an army, Traver reports 25% 18-19 years, 40% 20-24 years; roughly 20% had attended high school.

⁶⁴ Cf. academic instruction throughout the naval service and at all army posts (for enlisted men).

⁶⁵ During army service, boys should be quartered in tents, but receive indoor school accommodations. Civilian teachers supervise the studies (3 hours afternoon, 2 hours evening). Quick suggests instruction for the foreign-born (in English); unskilled boys early eliminated from school; negroes and Indians needing industrial training; boys wanting special mechanical, chemical, engineering or agricultural training; boys from regions lacking school facilities, boys preparing for high school, for college or technical institution.

⁶⁶ Quick, H. *A New Volunteer System*. Proceedings of the Academy of Political Science. Vol. VI, 1916. pp. 681-6.

⁶⁷ Post, C. F. *The Army as a Social Service*. Survey. Vol. 36, 1916. pp. 201-2.

⁶⁸ Registration for service is in effect a census of the vocationally and physically unfit, and offers a statistical basis for nation-wide educational reform.

⁶⁹ Meriam, J. L. *Measuring school work in terms of life out of school*. *School and Society*. Vol. V, pp. 339-42. 1917.

quicken school work. "Plattsburg" is equally a measure of physical education and model of intensive outdoor exercise.⁷⁰ With the healthiest outing many will ever experience and self care practised under actual field stress, federal training camps should consummate physical training in the schools.

As a great civic movement, Plattsburg is an institution peculiarly American. Its camp and field mingle all boys and level artificial relations.⁷¹ Boys take its training seriously "because they feel that it is linked to tremendous realities." When made national, this socialized education will express equality of service. Training for national defense "is the *act* of being republican, it is the *act* of being democratic." If we are to have an integrated nation, there is a major assimilation which this civic training guarantees. In the United States (1910), 14.7 per cent the total population is foreign born. Among 493,076 foreign-born white boys (15 to 20), barely 11 per cent attend school. Our immigrant masses own over 3 million unable to speak English. Even with night schools for immigrants on a community center basis, community of service should remain.⁷² "We have little that teaches subordination to the public good or that secures effective capacity to work co-operatively in its behalf." Co-operative activities might be taught apart from their associations with war, but (as Giddings suggests) there is very little indication that they will be.⁷³ War alone brings adequate social pressure. Universal service should enable all boys to learn civic duty by sharing defense or conserving national resources. Actual participation should mean deep, discriminating interests in the activities of current government departments. It should afford a definite alignment upon which to nationalize our system of education.

Constructive effort overshadows military training, but an army adequate for national emergency must precede service in non-combatant branches. "Special military training could be given as a branch of this service to those who were best fitted for it." An army of a million men would be less than 1 per cent our population.⁷⁴ The General Staff plan (February)

⁷⁰ Plattsburg is "a generic term, which applies to all camps where the Plattsburg spirit and the Plattsburg method of training prevail." (Major-General Wood.)

⁷¹ Earlier excessive training by women teachers is partially counter-acted.

⁷² It states make grants for evening-school support.

⁷³ Giddings, F. H. The Democracy of Universal Military Service. Annals of the Amer. Acad. of Pol. and Soc. Science. Vol. 66, 1916. pp. 173-80.

⁷⁴ A professional (hired) army other than for training or police, is an anachronism in democracy. The volunteer system is obsolete. (1)

assumes within four years, a first line of 1.5 million trained reservists; by the close of the eleventh year, 1.5 million second reservists (able to mobilize within 90 days). Roughly 580,000 boys (19 years)⁷⁵ are annually available for 11-months continuous training⁷⁶ and 4-weeks repetition (for navy and marine corps, 60,000; coast artillery, 20,000; mobile field forces, 500,000).⁷⁷ This estimate allows 42 per cent rejections and exemptions,⁷⁸ with a further annual loss of 10 per cent. If Germany is decisively defeated one might seriously question the wisdom of training so many millions as soldiers. The staff plan can be equally adapted to non-military activities. Military experiences should compete with other more constructive opportunities for service. With the war's close, this broader selective service might better replace the experiment of our present military policy during this world crisis.

In conclusion, it may be suggested that educators gifted with social imagination might well include in a policy of preparedness planning for universal military training and industrial mobilization, such devices as (1) compulsory state-wide physical education; (2) nationalization of the boy scouts; (3) part-time school control for all boys under nineteen; culminating in (4) a year of national service in great national out-of-door projects. War mobilization should reach its climax in the development of a lasting national system of education.

Wars are now fought by nations in arms. (2) At their onset, volunteers are unofficered, unequipped, untrained in highly technical warfare. (3) Volunteering is indiscriminate, involving workers in munitions and food production and supports of families, with maximum economic disturbance and pensions for dependents. (4) Volunteer systems are undemocratic shifting an elemental burden to the few (best). Recruiting is worked by unreasoning social compulsion or emotional advertising; finally becoming mercenary, dependent on bounties (Civil War). (5) The danger in democracy is not militarism but the difficulty of arousing even minor preparedness.

⁷⁵ Nineteen years is the youngest age for intensive military training to advantage; with large numbers (trained 19-21), service may precede serious family and vocational ties. The present universal service act meeting actual war, places the minimum at 21 years.

⁷⁶ Cf. the Chamberlain bill (S. 1695) which called for 6 months intensive training in the field.

⁷⁷ The staff plan provides a professional army of roughly 97,000 in overseas garrisons; 29,000 as frontier forces; training cadres (officers and enlisted men) for 16 army divisions; with essential administrative personnel. The Reserve Officers' Training Corps with divisions at one or more colleges in 44 states, affords an important control higher educational institutions may exercise over the citizen army (much as West Point is related to the professional forces).

⁷⁸ Discretionary exemptions include pilots and mariners in sea service; persons engaged in industries necessary to the military establishment or maintenance of the national interests; persons with dependent relatives; all physically- or morally unfit.

POSTERS AND PICTURES RELATING TO THE EUROPEAN WAR

By LOUIS N. WILSON, Librarian, Clark University

In August 1914 immediately after the breaking out of hostilities Clark University Library decided to make as complete a collection as possible of the printed material dealing with the great conflict, and we at once instructed our booksellers to send us, for inspection, any and all books and pamphlets relating to the war, as soon as they were published. I also wrote to personal friends in Russia asking them to send us any items of interest that appeared in that country on the same subject. Toward the end of 1914 we received from Mr. and Mrs. Frederick M. Corse of Petrograd a few of the first Russian war cartoons. They were not particularly artistic but they were most interesting and attracted a great deal of attention as coming from Russia and as the first of the war posters to be seen here. Then followed the exhibition of English recruiting posters by Mrs. Winslow Warren in Boston; of these we purchased as many as we could and thus we were committed to collecting posters and pictures as a part of our war collection.

In December 1916 Mr. Louis Raemaekers consented to design a special book plate for this collection, the receipt of which we are now impatiently awaiting.

Of books and pamphlets dealing with the war we have received over 3,600. A few of the German books Dr. Lyon reviewed in the April 1917 issue of the *Journal of Race Development* (vol. 7, pp. 385-409) and the members of the Seminary in History have reviewed some of the English and American books for the July issue of the same *Journal*. Since March 1916 we have received practically no German material, but we have every reason to suppose that some 2,000 or 3,000 items are awaiting the day when the war shall end and they may be shipped to us. But the literature of the war is not our present task, so let us turn to our subject.

In addition to 2,000 of the official French photographs our collection now numbers 1,060 Posters and Pictures, divided by countries as follows:

England	117	Italy	19
France	437	Japan	13
Germany	160	Australia	7
Russia	132	Canada	32
Holland	143		<hr/>
			1060

These are all single pictures or sheets that have been mounted on cotton cloth to ensure preservation, and does not include a large number of bound volumes of Gift Books, cartoons and illustrations dealing with the war, of which we already have over one hundred and fifty.

ENGLAND. The first posters were issued in England for recruiting purposes. England was the only nation in Europe at the time the war broke out that did not have a system of compulsory military service. With a standing army of only 200,000 soldiers she was ill prepared to enter the great conflict on land and would have fallen an easy prey had it not been for her sea strength—if, indeed, she could have entered the war at all.

Faced, then, with the necessity of raising troops and faced also with the Englishman's aversion to compulsory service, and a large standing army—an aversion dating from the days of the Stuarts—there was but one thing she could do, appeal to the patriotism of her people and induce her sons to enlist for the war. A national recruiting committee was formed and under its auspices over three million men were added to her fighting forces in the course of two years. Now that we face a somewhat similar problem we are told that England made a great mistake in not adopting conscription in August 1914, as she finally did in 1916, but it is very doubtful if a conscription bill could have passed the House of Commons in August 1914. At that date the English were not "keen" for war and their own grave danger was not apparent to them. Even two years later there were many who dreaded and fought the passage of a conscriptive measure.

One of the first evidences of the work of the Parliamentary Recruiting Committee was the appearance throughout Great Britain of the recruiting posters, ranging in size from, roughly, 58 x 39 in. to 30 x 19 in. The committee evidently had the assistance of experts in this field as the posters themselves, and the results they achieved, amply testify. The pictures are simple and avoid detail. A single figure of a man in uniform beckoning, and not a word of print on the sheet; a soldier with gun and bayonet, a black figure silhouetted against a yellow background and only the words "Be Ready. Join Now." A map showing the southern coast of England and the northern coast of France on which stands an English

soldier in khaki shading his eyes and looking toward England, with the words "Boys, Come Over Here You're Wanted." The figures of two English soldiers on the crest of a hill with fixed bayonets, silhouetted against a rosy sky, and the words "Don't Stand Looking At This. Go and Help!" These are, perhaps, among the best of about 150 that appeared. Historical figures are almost entirely absent. There is one that bears the face of Earl Kitchener and his appeal for volunteers; another with battle ships and the figure of Lord Nelson, with the words 1805 "England Expects" 1915 "Are you doing your duty To-Day." One showing the map of the British Isles and the face of King George.

Almost all are pictorial, the notable exception being the largest sheet of all, measuring 78 x 58 in., headed "Remember the Lusitania" and after recounting the verdict of the coroner's jury, "It is Your Duty to Take up the Sword of Justice to Avenge This Devil's Work. Enlist To-Day."

Later on when the War Loans were put out, about 25 posters were issued by the Parliamentary War Savings Committee and these again proved very effective. They are about all of the smaller size, 30 x 19 in., and are not so interesting, pictorially, as the recruiting posters.

Taking these English posters as a whole one notices three things; artistic merit, simplicity, and size. The aim is to attract attention and to hold it. In this respect the larger ones seem to have been most effective.

Other posters were issued, some being reproductions from *Punch*, and some drawn by Spencer-Pryse and by Frank Brangwyn, these latter often commanding high prices as works of art. One of Brangwyn's figures "The Prisoner" shows a face peering in at the grating of a cell where a soldier is seated, with head buried in his arms on a table. The whole attitude of the figure is indicative of despair and it is a striking bit of great artistic merit. Many of these pictures now sell at from five to ten dollars each, while his "Violation of Belgium" has brought as much as twenty-five dollars.

Of paintings of the war scenes we have none except reproductions of three charming water colors by E. Handley-Read of the Machine Gun Corps.

FRANCE. Although the French needed no recruiting posters they have probably issued more posters and pictures than any other nation. These posters differ from the English in that they are all issued for the purpose of raising money for charitable purposes; for hospitals; for orphans; for the families of those at the front; for those crippled in the war, and for special collections for the Serbs or the Belgians. The

pictorial element is not so prominent a feature as in the English recruiting poster and there is more printed matter, but they have the charm that attaches to almost every thing done by this wonderful nation. So far as we have seen there is no duplication between these and the English except in one case. A French War Loan poster has the figure of a German soldier overborne by a French gold piece on which the Gallic Cock is shown with open beak outstretched; the lettering is "Pour la France. Versez Votre Or. L'Or Combat Pour la Victoire." While one of the English shows a prostrate German soldier under a five shilling piece with the words, "Send Your Five Shillings To Your Country and Crush the Germans."

Pictures dealing with the war France has issued in great quantity, many being the work of well known artists like Steinlen and Lucien Jonas. There are also innumerable sets of a less pretentious kind by such men as Geoffroy, Guy Arnoux, J. G. Domergue, J. Bac, and others.

Some of these pictures are very impressive, as the one showing the German Kaiser stooping over to examine a fallen crucifix and asking "Est-il cuivre?" Another shows a bedroom with a bed, a bureau, beside which stand two little girls, one holding a doll in her arms while a boy crouches at the foot of the bed gazing at an open window through which is seen a German helmet and a much beringed hand on the window stool. The little lad says, "Le v'la! Vite, cache ta poupee, Simone!"

Lucien Jonas is perhaps the best represented in this French group. His pictures are excellent and many of them have a religious cast. One shows the interior of a Church; before the altar lies a dead priest, while on one side stands a German soldier drinking from the sacred vessel, and another sits on the altar steps singing or reading from a book. He has a number of spirited drawings of trench attacks; one "Before Verdun" shows French soldiers firing over the walls and the German dead lying thick in front. One other deserves mention—that of a blind soldier being led by a Red Cross Sister. The pathetic figure of the man with his cane in one hand, feeling his way, while the outstretched fingers of the other hand, the head thrown back, and the pitying expression on the face of the Sister, all combine to make a powerful picture.

Of Proclamations by the government and by the City of Paris there are seventy. These cover; Message Du President de la Republique Française a la Nation Française (29 juillet 1914) commençant par ces mots "Depuis quelques jours l'état de l'Europe." Signé Poincaré.

Message du President de la Republique au Senat et a la Chambre des Deputés, le 4 aout 1914. Déclaration de guerre.

Declaration du Gouvernement lue le 4 aout 1914, par M. Rene Viviani, a la Chambre des Deputés et au Sénat. Déclaration de guerre.

Discours de M. A. Dubost, president du Sénat, le 5 aout 1915.

Message du Président de la République, le 5 aout 1915. Signée R. Poincare. Cette affiche commence par ces mots: " Dans l'égarement de son orgueil, l' Allemagne s'est représentée la France légère, impressionnable, mobile, incapable."

Notices of the Daylight Saving change of time; rules and regulations covering the sale of food, alcoholic beverages, coal, petrol and gasoline, the conduct of the French toward the British troops in their midst, etc., etc.

The 2,000 official war photographs are 4½ x 6 in. mounted on mats 10 x 12 in. They show transportation of food and munitions; munition making; Red Cross sections and ambulances; ruins of churches and houses; etc. Many of these are quite familiar as they have been reproduced in the illustrated papers and magazines.

GERMANY. Immediately after war broke out there came from Austria excellent pictures of the higher officers of the Austrian and German army and navy. (Unsere Heerführer. Maler, Oskar, Bruch. K. u. K. Kriegsministerium, Kriegs Fürsorgeamt, Wien. IX.) They are in tint and each one bears the man's signature in fac-simile underneath. They measure 11 x 15 in., and there are here 120 of them. They are a fine looking set on the whole, even to the strong, massive jowl of Von Hindenberg.

From Teubner of Leipzig came a set of twelve plates in black and white. (Führer und Helden. Federzeichnungen von Karl Bauer, 1914). Another set of fourteen with a foreword by Dr. Karl Lamprecht. (Unsere Führer im Weltkrieg, 1914. Springer, Leipzig. Oct. 1914.)

Later on came a portfolio containing ten views of the devastation caused by the Russians in East Prussia, with an introduction by Edgar Alfred Regener. (Bilder aus Ostpreussens Not. Von Bruno Bielefeldt. Bei Georg D. W. Callwey, Munchen.) Showing ruined homes and desolation. Will they ever give to the world pictures of the desolation they have caused in Belgium, France, Serbia, and Roumania.

Another set is "Aus Galizien und Polen" 14 Steinzeichnungen vom östlichen Kriegsschauplatz, von Max Buchever. E. Reinhardt, München. There is another series; (1914-1915 Ein Mappenwerk mit 30 Bildern von Fritz Erler u. Ferdinand

Spiegel. O. Troitzsch, Berlin) of which only the first picture has been received. It is 17 x 20 in., in tint, and shows the German trenches with bombs bursting near by.

Perhaps one of the most characteristic sets, however, is "Zwölf Kriegsbilder" Von B. Wennerberg. A. Langen, München, a series of beautifully drawn and colored pictures showing life in the Fatherland during war time. There are a dozen of them—a wounded officer recounting his exploits to two young ladies; gay crowds about bulletin boards announcing German victories; an officer on furlough being taken out in a boat by two fair ladies; a soldier in a restaurant surrounded by a group of waitresses all smiling upon him while a civilian at a near by table receives no attention; a group of pretty girls gathered about a table following the movements of the army on a map; a sentinel in the street whose helmet is decorated with flowers by two girls; a train all decorated with boughs and loaded with soldiers who are being served with coffee and roses by a group of girls; etc., etc. Not a sad note any where; all joyousness, gay colors, pretty girls and smiling faces. One wonders if this is true today.

Unfortunately the German collection is small at present and we must wait until the war is over to get a correct idea of her point of view as shown in pictures.

RUSSIA. During her earlier wars there were issued in Russia a large number of cheap gaudy prints of battle scenes with a short description of each underneath. These pictures sold for about two cents apiece and were very popular throughout the Empire. In the early months of this war a similar crop appeared. They represent gallant acts of Russian troops; bombs bursting in livid flames and blood flowing in rivulets. Similar pictures have been issued by the Italians and the Japanese. Later came another series of a little higher type—a cossack driving a Turk out of Constantinople; a Russian soldier seated on a drum smoking a cigarette and smiling at a Turk who storms and rages in front of him while in the background are the towers and minarets of Constantinople; a soldier dragging by the ear a German in one hand and an Austrian in the other; a peasant of huge bulk playing ninepins with the Teutonic cities, probably intended to represent the great power of the Russian Empire.

In November 1916 our good friends the Corses of Petrograd sent us fifteen of the new Russian war loan cartoons which had just appeared there. They were a distinct improvement upon previous Russian posters we had received and showed unmistakable signs of having been modeled after the English and French posters, although in no sense copies:—A soldier

with fixed bayonet standing between the walls of a trench; outlines of the figures of soldiers in white lines against a red background; soldiers wrapped in furs on guard with snow covered landscape; machine gun corps at work; sailors loading naval guns, with a Russian navy flag underneath; the Russian double headed eagle driving the German eagle to earth; an aeroplane with mounted gun; a mediaeval horseman in gorgeous trappings carrying the imperial standard—and various pictures of munition works and munition trains, go to make up a very fascinating collection, small as it is.

HOLLAND. With one exception the only Dutch pictures in this collection are those of Louis Raemaekers, perhaps the most important artist figure brought out by the war.

Louis Raemaekers was born April 6, 1869 at Roermond. His father Josephus Raemaekers was an editor and publisher with an artistic bent as is shown by the great interest he took in bringing about the restoration of the beautiful Church of Our Beloved Lady at Roermond in Limburg where the family lived. His mother was of German birth and is still alive and very much in sympathy with the work her son is doing for the allies. When the war broke out Raemaekers was living quietly in the historic town of Haarlem where he was known as a clever landscape artist and portrait painter. He has a wife and three children, two girls and a boy.

The first cartoons appeared in the *Amsterdam Telegraaf* and immediately commanded world wide attention. They have been reproduced in millions of copies and have penetrated to every corner of the civilized world. The first pictures were not directed primarily against Germany, but against the horrors and cruelty of war in general. But the treatment of the Belgians by German soldiers aroused Raemaekers's chivalrous spirit and from that time his pictures have created perhaps more rage and indignation in Germany than any other single factor in the war.

It is stated that the German frontier guards offered the Dutch soldiers 12,000 marks if they would hand Raemaekers across the border. Whether this is true or not we cannot say, but the *Cologne Gazette*, in a leading article on Holland, threatened that country that "after the war Germany will settle accounts with Holland, and for each calumny, for each cartoon of Raemaekers, she will demand payment with the interest that is due to her." It is certain that strong protests were made by the German Government which represented that such work seriously jeopardized the neutrality of Holland. Raemaekers was arrested on this charge and it is needless to say he was discharged. He found it convenient to leave

Holland for England where he was received by the Prime Minister, and was entertained and feted wherever he went. He has received the Cross of the Legion of Honour at a special reception held in his honor at the Sorbonne in Paris.

This collection contains Raemaekers' pictures in four sets: (1) Seven parts issued by the Uitgevers-Maatschapp. "Elsevier." Amsterdam, each containing twelve cartoons; (2) The "Land & Water." edition issued in shilling numbers to be completed in twenty-six parts, each part contains twelve cartoons in colors and facing each picture is a page of text contributed by eminent English and French writers; (3) "The Great War." A Neutral's Indictment. One hundred cartoons by Louis Raemaekers. With an appreciation by H. Perry Robinson and Descriptive notes by E. Garnett, London. The Fine Art Society, Ltd. 1916; (4) One hundred and forty-two colored pictures 11 x 15 in., mounted on cardboard 15 x 22 in.

The originals have brought high prices for war charities and are owned largely by wealthy collectors and Art Museums.

ITALY. The Italian posters are here few in number and mostly of the highly colored type. They are evidently printed in New York and may not represent Italy's poster contribution in this war at all.

JAPAN. The Japanese pictures are also of the highly colored, inexpensive kind, issued as "Illustrations of the Great European War." Each one has a number. The highest number here is No. 43 which shows they have been issued in fairly large quantities.

AUSTRALIA. Of these we have but seven. They follow the English in style and color. One in silhouette shows a boy scout standing in front of his perplexed father and the words, "What Will Your Answer Be When Your Boy Asks You 'Father—What Did YOU Do to Help When Britain Fought For Freedom in 1915?' ENLIST NOW." Others show, a soldier on the battlefield with gun raised in one hand and giving the Australian cry "Coo-ee!"; a soldier of the motorcycle corps with bandaged head, pointing to ruins in the distance, with the words "The Latest Despatch. Send More Men!"

But the most striking of these Australian posters is a large one in yellow, black and blue, with the sphinx and the pyramid, and a line of marching soldiers. The text is:—

"When the fiercest battle's ended and the longest race is run,
When peace once more is blended with the shining of the sun,
Will YOU feel Hale and Hearty, as our boys beside the Nile?
Will YOU be able to return your wounded Brother's Smile?
ENLIST!!"

CANADA. The Canadian Posters are, naturally, modeled after the English, the chief distinction being that the Canadian have the text sometimes in French and sometimes in English. Looking over these as a whole one is inclined to give preference to those in French, although all are good. If we were to offer criticism it would be that in most cases they are overloaded with reading matter, and copies of letters in script are never very effective on posters.

There are two good ones calling for volunteers for the Irish Canadian Rangers; two still more striking ones, one in French and one in English, with a single soldier in the foreground and a Union Jack as a background were issued by the Gazette Co. Ltd. of Montreal early in the war, and have not been surpassed by any of the later issues.

On looking over the collection as a whole one notices that the posters of each nation stand out as distinctly different from the rest, except in the case of the crude, highly colored sheets issued in Italy, Japan and Russia, to which reference has already been made.

Some think the poster the best form of advertising and hold that the billboard, suitably located and controlled, might be raised to the dignity of a civic and national asset. Be this as it may, such a collection as is here gathered together is well worth careful study.

THE LECTURE IN COLLEGE TEACHING

By C. A. LYFORD, St. Lawrence University

It is easy to read a lecture from prepared notes. It is better to know the subject well enough so one can stand before his class and construct the presentation as he proceeds. If one is indulging in constructive thought himself, he is more likely to lead his students through the argument in a logical manner. By the expression upon one's face, and the occasional hesitation caused by the search for a proper expression, or by the motion of the hand or head which tells of a satisfactory rounding up of ideas preparatory to formulating in a sentence, the student is not only carried on by the train of thought as it unfolds, but is aided in other ways as well. He has opportunity to do a little thinking himself. He may occasionally have opportunity to anticipate. Indeed he is, without being aware of it, encouraged to anticipate; and what is anticipation under such conditions but constructive thought and invention. His inventions are quite likely to be along the proper path, and any incorrect invention is immediately corrected as the instructor proceeds. Cannot the lecture be made a presentation of a problem so that to follow the trend of thought will awaken a little of the spirit of research in the young student? Many lectures to college students are mere statements of facts and ideas so rapidly spoken that the listener can neither reconstruct the thought nor preserve the form as notes. If the lecture can be made the presentation and solution of a problem is not the student who listens virtually solving what to him is a little piece of research? Is there much more to be desired than to instill in our students a little of the spirit of inquiry? It is the belief of the writer that the lecture may, from the standpoint of the student, be the source of ideas or facts, or of both, which may take the place to some extent of actual experience to be gained only slowly in the laboratory or the world at large, and that these facts or ideas should be so arrayed before the student that he is practically bound to work out the train of thought himself, and to construct his own conclusion or theory with the feeling that he has been winning from the field of the unknown or the unassimilated something definite and objective which he can call his own. Ideally the lecture should not be used as it is so often as merely a

source for information which can be equally well gained from books. The chief object should be to vitalize the subject by giving the student opportunity and incentive to exercise his mind in company with that of the instructor. If the mind is not literally exercised the time has been largely thrown away. The writer has known a couple of young instructors whose lectures were merely repetitions of the text. The students were supposed to put a few hours a week upon the study of the text, but they soon found this unnecessary.

The lecturer should *work* before his class as an expert artist works upon his sculpture or his painting. If one wished to study sculpture from Rodin would he merely ask the artist to show him all the pieces he had ever chiselled out, or would he not more likely ask to be allowed to stand by the worker's side while he worked? The real student would attempt to anticipate the master's next move and would try to see the reason for it when the move was made. If conditions would permit, the student would certainly like to work side by side with the master upon the same piece. That man is the best lecturer who gives the greatest opportunity to his students for accompanying him in real constructive reasoning. Bagley has used the term "artistry" in connection with the thought that a teacher should teach as though what he is engaged in is the greatest achievement in life. Certainly judging from experience, it should be rated quite an achievement when a teacher can stand before a class of students and make sure that each and every one *understands* what he has been driving at. A teacher who is not conscious of great effort every time he stands before his class cannot possess the spirit of artistry and he is no better than a book.

One may recognize two sorts of lecture; one whose aim is to bring the lecturer's view before his hearers, or to recount some experience of travel or bit of observation; the other of more academic nature whose object should not be primarily to impart knowledge but to serve as an example of exposition of the *method* of attack and solution of a problem. It would follow from the argument that the lecture should not be employed for academic purposes in subjects which do not lend themselves to exposition in a constructive or evolutionary manner. It may be said that there is a kind of reciprocal relation between the ideal lecture or demonstration and the recitation. In the lecture the teacher should do most of the talking and the student should accomplish at least a minimum of constructive thought; while in the recitation the instructor subordinates himself and the student does most of the talking while his mind is actively engaged not in recalling things from memory, but in carefully working out his argument as he

proceeds. The writer frequently encounters students who lose all power of thought the instant the first word is uttered. This is because most students have in their earlier schooling come to regard a recitation as successful only if they are able to come to class anticipating every possible question and are able to go off at the pull of the trigger, stopping only when the force of the pent-up charge is spent or upon interruption by the instructor. Such students say a lot in a short time if let alone, but much of what they say is of no value; they might spend half the time thinking and half the time talking and get better results, but the thought of thought frightens them much as the feeling of water rising over one's face frightens the novice swimmer as he tries to float in the water. In such subjects as do not lend themselves to the proper lecture method, or in certain parts of other subjects, the lecture should be thrown aside and the unadulterated recitation should be used based upon text and collateral study of any sort available, whether laboratory work or further reading. During a recitation an instructor will have plenty of opportunity to make sure that no points go by improperly understood, and at such times he would be justified in giving a few moments to explanatory or descriptive discussion. Any thing that may be done to ensure that the student finally understands the subject matter at hand is legitimate, but to lecture simply because in this way it is easier to be sure that the student has been over the ground, or because it is easier for the student to sit and be amused than for him to study is not justification. If by the time a student is in college he may not be counted upon to cover the ground he is not fit to be in college. It is another matter that he may not entirely understand every little point upon his first reading, for this may be dealt with through the medium of the constructive lecture and the recitation. It is the belief of the writer that some of us are tempted to use the recitation not so much for the benefit of the student as for the purpose of getting by purely mechanical means a basis for estimating his intellectual level. This may be quite as closely approximated through mental estimate by the instructor upon daily contact with the student supplemented by occasional written tests.

To illustrate the writer's conception of the way to make use of the lecture a concrete case will be considered. In the science of chemistry the purely descriptive lecture should find very little place. If a student cannot understand a purely descriptive matter by reading he cannot do so by hearing it. Of course no lecture on such a subject can be given without the descriptive element entering to some degree. A lecture upon aluminium and its compounds which merely recounts

the facts concerning a certain set scheme of topics such as "the element and its occurrence—properties—preparation—uses—aluminium oxide and hydroxide—salts of aluminium—earthenware," etc., never appealed to the writer either as student or teacher as an especially inspiring attempt to awaken interest in the pursuit of the science. The students should study such topics from the text and in the laboratory only after a thorough introduction in the theoretical aspects based upon the place of the element in the Periodic Classification and a proper exposition of the working value of the Electromotive Series, the Dissociation Theory and the Mass Law as they pertain to the strengths of acids and bases, hydrolysis, etc. The student finds described in his text the iron sulphides and carbonate. He may not find any reference to aluminium sulphide and carbonate, and he thinks the book is incomplete and desires to find a book which describes all compounds. He has not been taught the fundamentals of the science. If he had been, he would realize that the reason why elementary books sometimes make no reference to such compounds is that under the conditions of laboratory experience those compounds are not encountered. Moreover he would know the reasons why they are not encountered, and perhaps when he takes up the study of analytical chemistry he could understand why ammonium sulphide precipitates iron sulphide and aluminium hydroxide together and not both as sulphides. A set of descriptive lectures is positive in its information so far as it goes, but it does not explain the hyatuses and omissions. In other words, the student escapes without becoming aware of the limitations of experience and procedure in scientific work. The term "descriptive chemistry" might be dropped from the college curriculum and some better one substituted. Perhaps a different title for the course, one with a little more suggestion of the dynamic, might cause an unconscious effect upon the instructor which would gradually lift him out of the rut of simple description, and give him some incentive to work his own mind a little. Example has a certain pedagogic value even with college students, and a dissipating imitation is always more easily excited than creative imitation is.

Though the question of the relative pedagogic values of a purely lecture course introduction to a science like chemistry and a mixed laboratory—recitation introduction is not germane to the original thought that prompted the writing of this paper, the writer cannot forego making a few remarks concerning beginning the subject of chemistry by the purely lecture method. In academic circles one soon becomes aware of the existence of two armed camps. One of these usually appears

to be a little more on the defensive than the other. One is a little afraid of the other, and the other doesn't care enough for the booty to make an assault on the first, for it believes it sees things going favorably for its interests. I refer of course to the classical camp and the scientist camp. Many well educated people have studied Latin, History, Philosophy, Ethics and Theology, and perhaps have had some "lecture courses in science." Such people took the lecture courses in science in just the same way they did their letters courses. The exercise of the memory is the chief aid in gaining such an education. How many are the men whose education is based almost entirely upon the things of the past or the empty speculations of the future. How many are the ministers whose sole preparation in any subject calculated to teach methods and practice of physical precision was gained by the same method that imparted to them their training in Hebrew and theology. Many ministers have become college presidents. Believed to be leaders in the educational world, they are more often hustlers for money. It is difficult to believe that one whose education has been gained almost entirely without exercise of the physiological senses of perception can possess the power of apperception to a degree sufficient to sympathize with the recent trend in education as it is being worked out by pedagogues of laboratory training in daily contact with students. The champion of the Classics must claim either that an education may be satisfactorily obtained without the coordinating development of the primary senses, or else that the study of the Classics does train all the perceptive senses equally well as the laboratory studies do. The scientist has the feeling that a real education, one which equips the student to meet the new problems of the future, can be obtained only through training of the perceptive senses, in observation, in construction, in formulation of ideas, and finally in lucid statement of the thoughts which have actually been engendered as the result of his experience. Elementary laboratory exercises are the experiences of the young beginner. If we take them away do we not lower the educational ideal of the scientist to the memory level as typified in classical study? Without attempting to cast a deciding vote in favor of either camp it may be said, however, that it is a shame for a scientist to think he is teaching science to beginning students when he gives a semester's time to a course of lectures in "Descriptive Chemistry," especially if no laboratory experience be given. It is a shame if for no other reason than that he is throwing away the only distinct advantage over the Classics claimed for science studies in the educational equipment of the student.

The thoughts expressed above represent an ideal concern-

ing the lecture method toward which the writer has always looked. He has never attained that ideal, but has more nearly approached it when working with adequate facilities than when shifting along without them. In many institutions there are three men doing the work that two might do if provided with proper material facilities and conveniences. Trustees and presidents sometimes appear to think it better economy to wear out their teachers and get poor results than to spend a little more on equipment and produce the conditions for a much more satisfactory academic atmosphere. Doubtless it is in some cases lack of proper equipment that tempts the college teacher of science to overdo the lecture method of instruction and indulge in pure book description into the bargain.

A RENAISSANCE IN THE SCIENCE OF EDUCATION

By ARCHIBALD G. PEAKS, New York University

I. WHAT OUGHT TO BE DONE?

The question of what ought to be done in education, is largely concerned with the aim of education. Since the necessity of educating the rising generation became a conscious problem in the world, the question of "What Ought to be Done" has dominated the thought of rulers, philosophers, and ethical, social and religious workers everywhere. For Confucius, education had two aims, (1) to develop character, and (2) to preserve social stability, and the means he employed was a great mass of ethical and social teachings covering every possible action of the individual, and practically every possible occasion which could arise. Thus each generation exactly imitated the previous generation in the minutest details of ethical and social conduct, and social stability was obtained at the expense of progress.

For the Ancient Egyptians and the Hindoos the practical considerations of Caste gave the aim, and the various classes of society were accordingly instructed in their several rights and duties. Among the Jews, and throughout Europe in the Middle Ages, the religious aim was dominant, hence education was largely religious in character. The ancient Athenian education was fashioned in accordance with its ideals of harmony, beauty, and symmetry, while that of the Spartans was necessitated by the practical considerations involved in keeping its conquered peoples in subjection. Both of these peoples adapted the means to the attainment of these diverse ends, hence the contrast between the educational practice in Athens and that in Sparta.

In our own time, many attempts have been made to influence the public schools by those who urge changes in them for practical reasons. In our country any one who urges the making of our education more practical can get a hearing at any time or place, and this argument has accordingly been much misused. In general we may say that if the aim of education is usually based on theoretical considerations, the means used in its realization are largely chosen because of their practicability. The public high school, the junior high

school, the vocational school, the pre-vocational school, the manual training school, the trade school, the technical school, the commercial high school, the truant school, the agricultural high school, the school of home economics, the open air school, the junior college, the municipal college, and the municipal university, are among the latest of the modern responses to the practical demands of the present.

Besides the general, national and public educational movements outlined above, the work, efforts and accomplishments of all educational theorists and reformers belong here. They are interested in "What ought to be done" in education from their special point of view. They set out to reform education by pointing out abuses and suggesting remedies for them, which will aid in making education realize the aim they have set for it, and proceed to test aim, means and methods all from their especial point of view. First among these we have the religious and ethical reformers, who take the "Formation of Character" as the basis of education. Then follow the rationalists and logicians who for different purposes would have the development of the reason as the chief aim of education. Again we have those who base their system of education on evolutionary principles, on a biological basis, or chose for their motto, "Mens sana in corpore sano." We have also the militaristic conception of education which might be conveniently grouped with those who say the aim of education is "good citizenship." Still another group would base their aims for education on sociological, on socialistic, on individualistic, or on anarchistic principles." Another group, consisting of experts in special fields of endeavor, would have for the center of education proficiency in the same field as themselves, while other groups would have "acquisition of knowledge," "formal discipline of the mind," "harmonious development of all the powers of mind and body," or the development of "aesthetic appreciation" as the aim of education. A very large group would have a psychological basis for education, another would educate "according to nature," while still another large group bases its educational aims on practical considerations.

Among educational theorists, we often find two or more aims which are more or less unrelated, set for education, as for example John Friedrich Herbart who bases his educational theories on ethical and psychological considerations; John Dewey, who urges ethical, logical, psychological and sociological principles in his discussion of educational aims; and Nicholas Burray Butler, who bases education on the scientific, literary, aesthetic, institutional, and religious inheritance of the race.

In each instance the educational theorist goes on to criticize educational theory and practice from his own special point of view and to suggest means for their improvement which are necessary from his special point of view. We have no fault to find with those who try to settle the aim of education on the basis of some especial consideration, but one should not take them too seriously. Anyone who undertakes to settle such broad and important questions as those underlying our educational aims and practice on the basis of his own prejudices or narrow personal view point will never get anywhere. Such men are preachers and poets, not scientists. We may be aroused and inspired by such men, but we are never sure that we are going in the right direction.

Is there no hope for a solid foundation for educational practice? Viewed fairly and impartially, we are compelled to decide that one who considers only "What ought to be done?" in education will never be able to settle permanently questions of educational practice. We do not wish to belittle the value for educational progress of the man who proposes theoretical changes in the aim of education. He may perform a great service to the world by contributing to the general aim of education, but he can say little or nothing of the details of practical school work. He has no final answer for the main problems of education which are (1) what to teach, (2) how to teach, and (3) when to teach it. Educational practice can never be firmly established, nor can a scientific basis be laid for it, by those who consider only, "What ought to be done?," without also considering "What has been done?," and "What can be done?"

II. WHAT HAS BEEN DONE?

The most obvious response to the question "What has been done?" and its message for educational practice, is that we should observe the results of our present day education, as standards by which to judge the work of the individual teacher, or to judge educational efficiency along any special line or in general. This is the usual way we judge the achievements of men and women. "Get results," is the injunction given those who are entrusted with the conduct of business enterprises. And we need not be surprised to find those who would set up standards for educational efficiency on the basis of the results already obtained.

This attitude toward educational practice is especially prevalent at the present time. Numerous so-called tests of the results of educational work have been made, and on the basis of these results, investigators have attempted to draw very important conclusions as to educational practice. They judge

the efficiency of the teacher in terms of the ability of the pupils as shown in the results of a test or tests, in comparison with the so-called "standard tests" which are claimed by their authors to be scientific standards for judging school efficiency in a special field such as the spelling or the arithmetic efficiency of a certain grade.

At the present time the country is flooded with scales and tests for intelligence, spelling, composition, penmanship, arithmetic, and standard tests of all sorts. They are used especially by school boards, departments of education, superintendents, and principals in the rating of teachers, and by teachers to illustrate standards of work. On the basis of the results of tests alone, wonderful conclusions for the science of teaching have been drawn. In many cases the conclusions given are merely what the investigator wished to find and have absolutely no relation to the results. This is their most glaring defect, and is found in practically all of the earlier investigations. Those who have employed such tests have been so anxious to prove a pet theory that they have explained the results not on their face value, but on the basis of their own introspection.

This error has been seen by some of the later investigators who have endeavored merely to set up scientific standards by increasing the number of records and treating them statistically. The results from tests have been collected by thousands and after being treated statistically, the average result is taken as a standard of individual efficiency. These so-called "standards" have been claimed by their promulgators as absolute standards of individual and pedagogical efficiency. Their devotees claim that the progress of a pupil or the efficiency of a teacher, or the efficiency of the educational system of a town, city or state may be accurately evaluated by the use of these standard tests. They claim that the efficiency of a teacher's work can be measured by these units as certainly as we measure time and space.

Let us examine these tests and standards critically that we may the better evaluate them. In the first place we cannot judge the efficiency of any teacher, pupil, or educational system on the basis of the results alone. Results are of no value to the science of education unless we know the conditions under which these results were obtained, and we must interpret them in the light of their contributing causes and of the conditions under which they are obtained. Many instances are known of children who were thought dull when tested by examinations, but who later proved to be leaders among men. We cannot judge of the real proficiency of children on the

basis of efficiency tests. Without entering into a discussion of the larger problems of methods of teaching, let us establish first scientific criteria for evaluating the proficiency of children.

Three kinds of criteria may be used as shown in the accompanying tables:

Criteria	How considered	Grade in per cent			Rank		
		A.	B.	C.	A.	B.	C.
Efficiency tests	Accuracy and completeness of reproduction as shown in answer to questions.....	90	90	90	1	1	1
Psychological criteria	Amount of effort used by each student. Repetitions used.....	95	80	70	1	2	3
Pedagogical criteria	Repetitions needed if economical methods of study were used.....	18	12	15	3	1	2

In the table above, are three students who are of equal rank when judged by an efficiency test alone, but when judged by the effort put on the work must be ranked differently. The third rank is based on the actual ability of the students as it should be when judged by the time and number of repetitions each would have used under economical methods of study. It is very evident that the three have different mental abilities, and that the student who needs only 12 repetitions is of superior ability so far as memory is concerned to the other two. Again, if we should cross question the three students concerning their understanding of what they wrote, we might find that C was superior to the other two, and if they had been taught differently, A might have been more proficient than either B or C in making use of the facts. What was the real value of the results when judged by efficiency alone? They do not even give a true value to the past performances of the student, and much less do they show themselves worthy of becoming standards for judging educational efficiency from a scientific point of view. Really vital factors of education cannot be seen by one who judges by tests alone. And will it serve any purpose or add any validity to the use of such standards if we average the marks of 500,000 tests instead of three? Will the standards be worth any more? The only possible answer must be that as a measure of individual achievement, the statistical treatment of such results does not add a whit to their value as standards for judging school progress.

Of what scientific value, then is a composition scale based on the results of a test when we do not know the conditions under which the composition was obtained? Can any one simply take a group of compositions and by selecting what he

thinks is an average composition set it up for a standard without knowing the technique of the teacher or the history of the individual? Can you take mere verbal expression as a true expression of the inner life of the child? Will the mere statistical treatment of the snap judgments of individuals on the basis of the results from tests alone give us a true standard of measurement of educational efficiency?

Most statisticians deny that you can discover causal connections by the statistical treatment of data for the reason that you cannot determine causes from effects alone without verification. To be of scientific value, the results from educational tests must be interpreted in the light of all that has preceded them, and must be related to the aim, means, methods and procedure both in the learning and in the testing. The results from a very few children where the conditions of learning and of testing are carefully controlled, are of immensely more scientific value than the results from a million children where the causes are neglected.

Have tests and scales which deal only with results any scientific value? If they have any value it is merely temporary to illustrate what results have been obtained from tests in other places. But they never are and never can be a true illustration of what should be expected from a class or grade. The greatest difficulty with such tests and scales is that the promoters make such extravagant claims for them. The application of such standards by school supervisors cannot but result in gross injustice to many excellent and painstaking teachers, while it may often induce teachers to show dishonest results. The criticism given as a result of such tests is rarely helpful. It is destructive to those who do not secure similar results, whether more desirable or not, and worthless to those who show high superficial results on account of memory cramming, dishonest work by the pupil, or false methods by the teacher. The greatest good a teacher may do along many lines is incapable of being judged by written tests. The use of such tests inevitably tends to lower the moral tone of the teacher and of the school. It makes supervision destructive where it should be constructive (seeking the causes of poor work and to eradicate them). It makes the supervisor critical of results when he should be critical concerning the causes which lead to poor results, and it is rare indeed that a supervisor who is merely critical of results can at the same time be helpful.

It becomes increasingly evident therefore, that when judged from any point of view the so-called "standard tests" have little or no value, and they may be positively injurious. As

standards for the judgment of teaching efficiency they are worthless unless the conditions under which they were obtained are carefully taken into account, and the teacher should be criticised and aided in her control of the causes which produce the desired results rather than on the results as such. The measurement of "What has been done?" is then, of little or no scientific value for education unless the conditions under which they are obtained are carefully controlled. Nor can the errors involved in neglecting the technique of teaching and learning when such tests are to be made, be overcome merely by treating the results statistically.

Can we then, come to any scientific conclusions for education on the basis of measuring "What has been done?" Shall our educational practice in the future be guided only by the results of "What has been done?" and theoretical speculations as to "What ought to be done?" It seems very evident that real progress in education can be controlled by neither of these considerations alone, nor by both of them combined. Before we can make any permanent decision, we must also discover "What can be done?" on the basis of the psychophysical nature of the child, and then we may be able to reach a permanent decision as to "What must be done?" in order to insure permanent progress in education.

III. WHAT CAN BE DONE?

In the preceding discussions we have clearly shown that permanent educational progress cannot be made on the basis of "What ought to be done?" alone. Nor can we make any appreciable permanent gain by setting up standards of "What has been done?" without knowing all the contributing causes, and the conditions under which these results were obtained. The answers to these two questions therefore, must be supplemented by that given to the question "What can be done?"

Up to the present time, in all attempts to find out "What can be done?" in educating the child, the child itself has been too little studied. We have given too much time and attention to courses of study and methods of teaching, and at the same time we have almost entirely neglected to scientifically investigate the results by various methods of learning. No one really believes that one person can really impart knowledge or skill to another. All the teacher can do is to direct the mind of the child in learning. She can arrange and classify facts, and present them singly or in relation to other facts, once or repeatedly, and by her skill she can hold the attention of the learner more or less closely directed to the subject under discussion. But the learner himself must do the acquir-

ing, and this acquisition is controlled by the laws which govern his powers of acquisition.

At present, these laws are but little known. We have been so much concerned with what to teach, and how to teach, that we have almost entirely neglected the all-important matter of investigating the best and most economical methods of learning. Though many facts concerning the nature of the growing child have been pointed out by students in various fields of scientific endeavor, these facts have been observed, organized, and classified from the point of view of the respective sciences, and not from the point of view of pedagogy. Psychology, for example, deals with mental phenomena but cares more about analyzing the mental processes than about the use of the mind in acquiring knowledge. Child study also does not meet our needs as it deals more with the growth and development of children under school age.

What we need is a science of pedagogy based on the answer to the question, "What can be done?" which shall consider not only what to teach, and how to teach, but will also consider the economy and technique of how to learn. Before any method of teaching or learning is commended to teachers, it must be thoroughly tried out under school conditions, and based on principles of pedagogy established by recorded observation and experiment, where all the conditions of teaching and learning are carefully controlled, or scientifically observed. What we most need is the requisite pedagogical criteria by which to judge pedagogical efficiency, and these criteria must be developed by the same methods used in all the sciences, viz., recorded observations, and experiments where the conditions are carefully controlled.

We have, then, a new answer to the question "What ought to be done?" which applies directly to educational practice, to the relationship between the subject matter and the mind of the learner on the one hand, and to that between the teacher and the mind of the learner on the other. To the teacher, the command comes plainly and forcefully, "*Use only those methods of teaching which will utilize the most economical and hygienic methods of learning.*"

We must apply the same criteria to the use of school room results as standards of comparison for school work. Only those results which are obtained under school room conditions, and which have utilized the most economical and hygienic methods of learning should be used as standards of measuring school room efficiency. "What can be done?" must be discovered by systematic experimental investigation before we can hope for any scientific basis for educational practice.

This question of "What can be done?" in spite of the many attempts to answer it made by educational theorists, has long remained unanswered. But within the last few years, two scientific movements in pedagogy have arisen and been developed in Germany, which have adequately recognized the problems involved in creating a science of pedagogy, and have attempted to discover "What can be done?" The first is the movement known as experimental pedagogy, represented by the work of the late professor Ernst Meumann, and the second is that known as experimental didactics, represented by the work of Dr. Wilhelm A. Lay. These men and their followers have set out to solve by scientific methods of investigation, two large groups of problems (1) to discover the psycho-physical nature of the school child as he grows and develops (experimental pedagogy), and (2) to investigate the most hygienic and economical methods of learning by the school child (experimental didactics). The problems of experimental pedagogy are best investigated in a pedagogical laboratory, while those of experimental didactics are best studied under actual school room conditions.

They use the methods of investigation which have yielded such large results in the other sciences, viz., systematic recorded observations, and experiment, the questionnaire in the early stages of investigating any problem, measurements when taken by experts, and statistics based on measurements of facts which are capable of measurement. In this country, the work along these two lines has been most systematically developed in the New York University School of Pedagogy, under the name of experimental pedagogy. During the past five or six years, many important investigations in scientific pedagogy have been made by the students of that school, and much has been done for the future of educational practice along these two lines.

It is therefore, only by the use of the scientific methods enumerated above that we may find a permanent answer to the question "What can be done?" And only through the science of experimental pedagogy (including experimental didactics), can these pedagogical questions based on the answer to this question be solved. In order that we may study education scientifically, therefore, there is a great need for pedagogical laboratories and experimental schools each under the control of a broadly educated and unprejudiced director who has the real scientific and critical attitude toward educational practice. Let us hope for the day when both these institutions may be seen in every large city and every state in our land.

No doubt now exists in our minds that progress in educa-

tion is possible only when we consider "What can be done?" as well as "What ought to be done?" and "What has been done?" In the answer to these three questions, we find the answer to the fourth and last of the series, "What must be done?"

IV. WHAT MUST BE DONE?

The answer to this question is to be found only after the consideration of the answers to the other three (1) What ought to be done? (2) What has been done? and (3) What can be done? No satisfactory answer has been given to any of these three questions as yet. The history of education as studied in our schools, deals very largely with the aim of education, but tells us very little about actual school conditions. It also neglects many educational agencies such as myths, proverbs, manners and customs, literature, the family life, the government, and many other practical considerations which influenced educational practice in the past even more than the theoretical teachings of priests and philosophers. Its answer to the query "What must be done?" is not at all satisfactory.

Before we can build up a science of education we must find out what can be done under the most favorable surroundings. Not all pedagogically possible things are pedagogically necessary, but before we fix any aims or standards for the measurement for education, these aims and standards must be pedagogically possible of achievement, i. e., we must know as a result of a scientific pedagogical investigation that they can be realized in educational practice. The answer to the query "What must be done?" is plain and unequivocal. *To insure permanent and lasting progress in education we must establish it firmly on a scientific basis.* This can be done only by using the methods of all the sciences, viz., systematic recorded observations, carefully controlled experiments, measurements taken by expert investigators, questionnaire supported by verified introspection when no other method can be used, and statistics based on facts that can be measured quantitatively.

It may be well here to contrast the results from the psychological-statistical test, and those from the scientific-pedagogical experiment. By psychological-statistical data, we mean that derived through the compilation and statistical treatment of the results from tests collected from various sources without control over the conditions or knowledge of the contributing causes. The results from such tests cannot be used as a basis for any scientific conclusions whatsoever. By scientific-pedagogical experiments, we mean the use of results obtained only by scientific methods of investigation.

There are also several differences in the aim or purpose of psychological and pedagogical investigations, viz.,

- (1) Experimental psychology investigates the mental processes for purposes of analysis, while experimental pedagogy investigates the possibilities involved in using the mind and cares nothing for mental processes as such.
- (2) Experimental psychology seeks to establish the general laws of the mind while experimental pedagogy is especially concerned with individual differences, in pupils.
- (3) Experimental psychology investigates all the mental processes of the mind while experimental pedagogy confines itself to investigating the operations of the mind of the school child in learning.

That there may be no question as to the method of procedure in making a scientific pedagogical investigation, I will here outline the method under four main heads:

- (A) Preliminary considerations
 - 1 The phenomena observed must be capable of some sort of quantitative measurement
 - 2 The investigator must have complete authority to arrange the phenomena to suit the purposes of the experiment
 - 3 The method of procedure must be governed throughout by certain pedagogical purposes
 - 4 The investigator must control the circumstances to suit the purposes of the experiment
- (B) Working hypothesis which will state in detail the pedagogical aim of the experiment, and according to which the phenomena studied should be arranged
- (C) The main investigation, which consists of
 - 1 Preliminary tests to perfect the technique and eliminate practice effects.
 - 2 The main investigation upon the results of which the conclusions will be based
 - 3 Controlling tests to check the results obtained in the main tests
- (D) Verifying tests, made by the same or by other investigators under similar or varying conditions, by similar or different methods.

It is only by making such arrangements, by following such methods, and by using all possible precautions against error, that we can secure results upon which scientific pedagogical conclusions may be based.

The laying of a scientific groundwork for educational prac-

tice is then to be no longer a matter of theory, but one of fact. Only those principles and methods of teaching and learning which have been established as a result of scientific pedagogical experiments are to be used in order to obtain the best results. The criteria of experimental didactics must be applied to all school work, and these demand that only the most hygienic and economical methods of teaching and learning shall be used. The hygiene of the mind demands that we must not misuse or abuse it in any way. We must discover its nature, and follow its laws in learning, if we wish to achieve the best results from its use. The economy of learning demands that school work shall be done with the least possible expenditure of energy by both teacher and pupil.

What, then, must be done? The first task before the workers in the field of experimental pedagogy is to put before the teaching profession a description of the aim, means, methods, and universal validity of the results obtained by experimental pedagogy. The next is to develop a critical scientific viewpoint in educators everywhere so that they may properly evaluate proposed changes in our educational practice. The third is to find those who are enough interested in the establishing of a scientific basis for education to do the work required. The fourth is the establishment of pedagogical laboratories and experimental schools, not in the hands of politicians and spoils hunters, but directed by men and women who have the real scientific spirit of investigation, and the altruistic spirit of service to the great cause of educational progress. The fifth and final necessity is that we judge all educational practice by the acid tests of experimental pedagogy, which are that education must be based on the psycho-physical nature of the school child, and that only the most hygienic and economical methods of teaching and learning shall be used.

BOOK REVIEWS

THE WORK OF SAFFIOTTI AND TREVES

1. *La "scala metrica dell'intelligenza" di Binet e Simon. Studiati nelle scuole comunali elementari di Milano.* By ZACCARIA TREVES and F. UMBERTO SAFFIOTTI. Milano, 1911. Pp. 67.
2. *Clinica medico-psico-pedagogica.* By F. UMBERTO SAFFIOTTI. *L'infanzia anormale.* V, 1911, 102-116.
3. *La psicologia sperimentale nell'indirizzo pedagogico moderno.* By F. UMBERTO SAFFIOTTI. *Riv. pedagog.*, Anno V, Vol. I, 1911. Pp. 8.
4. *Psicologia e pedagogia sperimentale nell'opera di Zaccaria Treves* By F. UMBERTO SAFFIOTTI. *Riv. pedagog.* Anno VI, Vol. II, 1911. Pp. 10.
5. *L'assistenza degli anormali scolastici e la prevenzione della delinquenza minorile.* By F. UMBERTO SAFFIOTTI. Second Cong. nat. d. Soc. d. Patronata per i Minorenni e per i Carcerati. Torino, 1912. Pp. 9.
6. *L'opera di Zaccaria Treves e la psicologia sperimentale.* By F. UMBERTO SAFFIOTTI. Milano, 1912. Pp. 28.
7. *Sulla legittimità di una psicologia delle menti associate.* By F. UMBERTO SAFFIOTTI. *IV. Cong. inter di filosofia.* Bologna, 1913. Pp. 11.
8. *Osservazioni sperimentali sul diverso comportamento del lavoro muscolare nella scrittura durante il calcolo.* by F. UMBERTO SAFFIOTTI. *Riv. d. Psicol.* VIII, 1913. Pp. 11.
9. *Note psicologiche su due gemelle.* By F. UMBERTO SAFFIOTTI. *Riv. d. Antrop.* XVIII, 1913. Pp. 11.
10. *Contributo allo studio dei rapporti tra l'intelligenza e i fattori biologico-sociali nella scuola.* By F. UMBERTO SAFFIOTTI. *Riv. d. Antrop.*, XVIII, 1913. Pp. 34.
11. *Sul "Quoziente d'intelligenza" nella misura dell'età mentale in rapporto all'età fisica.* By F. UMBERTO SAFFIOTTI. *Riv. d. Antrop.*, XIX, 1914. Pp. 10.
12. *Nuovo modello di segnalatore elettrico della voce.* By F. UMBERTO SAFFIOTTI. *Riv. d. Antrop.*, XIX, 1914. Pp. 5.
13. *Forme e contenuto dell'associazione spontanea nei fanciulli.* By F. UMBERTO SAFFIOTTI. *Riv. d. Antrop.*, XIX, 1914. Pp. 14.
14. *Rilievi e osservazioni sul rendimento scolastico nei diversi metodi di educazione infantile.* By F. UMBERTO SAFFIOTTI. *Cultura Popolare*, IV, 1914. Pp. 23.
15. *La misura dell'intelligenza nei fanciulli.* By F. UMBERTO SAFFIOTTI. Roma, 1916. Pp. 286.

The great variety of interests of Professor Saffiotti will be seen from a mere perusal of the titles given above. His important recent published work, however, is particularly in the field of the mental testing of children. In 1909, in collaboration with Professor Treves, he undertook the application of the Binet-Simon tests of intelligence to 406 pupils of the first grade and 260 pupils of the sixth grade in the schools of Milan. The results of this investigation are given in a monograph, marked 1 in our list. The authors first describe each of the Binet-Simon tests from 4 to 13 years, inclusive, and also include in the text the materials and copies of the test blanks. They then give an analysis of their results and a comparison of these with the results obtained

by Binet and Simon. They criticize the Binet-Simon scale on the basis that the tests are not of a regularly increasing degree of difficulty, and also criticize the general concept of grading intelligence in terms of "mental age." In place of this, the authors suggest a grading of the tests with regard to difficulty and a grading of the person tested with regard to the degree of difficulty of the tests passed. Three general grades of intelligence are given: 1. Defective, those who pass only those tests which are passed by over 60 per cent. of the children; 2. Average, those who pass the tests which are passed by from 40 to 60 per cent. of the children; 3. Advanced, those who pass tests which are passed only by 20 to 40 per cent. of the children. Each grade of intelligence is further subdivided into three divisions. This is called the Treves-Saffiotti method although it is merely another way of *scoring* the tests of the Binet-Simon scale.

Saffiotti (11) attacks the concept of the "intelligence quotient," because it also employs the concept of mental age; and the author's ideas on this subject are finally crystallized and expanded into a large volume; (15) the first part of this volume deals with the general concepts of intelligence taken up from the historical point of view. An astoundingly great number of authors are referred to in this section. Then follows a discussion of the Binet-Simon scale under the heading "The Measurement of Intelligence by Mental Age." The results of all investigators who have employed this scale are given with great completeness and are made the basis of numerous and enlightening comparisons. Of great interest, even to the student who does not read Italian, are the several large tables (pp. 118-123) in which are given the mental age assigned to each of the 63 individual Binet-Simon tests by each of the 14 authors who have critically discussed the matter. One also finds tabulated (p. 130) the chronological-mental age distribution of the subjects tested by each of these 14 investigators. The last half of this volume is concerned with a critical discussion of the general concept of mental age as an index of intelligence. Saffiotti then develops his concept of scoring the Binet-Simon tests in terms of a scale of mental grades. This discussion of the Treves-Saffiotti revision is made on the basis of some new results as well as the older results by these authors, mentioned above. The book contains a bibliography of 603 titles mostly on the literature of the testing of intelligence. Although this bibliography is lacking in some very important American titles, it should prove of great assistance to the student.

A program of work for a medico-psychico-pedagogical clinic is outlined by Saffiotti in another paper. (2) The tests, as outlined, include the family history, the school and pre-school history of the case, an anthropometric examination, a somatic functional examination, and finally a psychological examination. In this latter, 15 sorts of mental processes are to be investigated and the Treves-Saffiotti and De Sanctis tests are recommended. Another paper (5) deals with the problem of the mentally deficient child in relation to juvenile delinquency. A statistical study is made of 401 cases. Of these over 42 per cent. were either readmitted to the schools or succeeded in making their way in the world. The different kinds of abnormality are discussed in relation to the different kinds of crime. Special instruction in special schools is recommended for this type of case.

The influence of social and biological factors upon intelligence is discussed in another paper. (10) For this purpose the results of the Milan investigation are analysed with regard to the occupations of the parents of the children. An examination of the results of the tests shows that the two groups whose parents were laborers and servants, on the one hand, and those whose parents were professional men and merchants on the other, show practically similar distributions. But a

great difference is found between the children attending schools in the center of the city and in the outlying districts. Saffiotti assumes that there are different degrees of excellence of teaching in these parts of the city, and hence concludes that the sort of teaching which the child obtains is a much more potent factor in determining intelligence than is the social and economic standing of the family from which the child comes. This seems to indicate, we believe, that what Saffiotti is measuring is not the native intelligence of the children but merely classroom acquisition.

The effect of pre-school methods upon the intelligence of young children is investigated. (14) A group of children were tested by the Treves-Saffiotti tests. Some of these had merely remained in the family up to school age, others were taught by the Fröbel method, others by the Montessori method and still others by mixed methods. The results show that the Fröbel method seems to be the best of the pre-school methods of instruction. Analysis shows that practically no differentiation in intelligence distribution can be made between infants raised in the home and those raised in asylums.

The results of the application of a series of psychological tests upon twins of 11 years are given with great completeness. (9) Great differences in intelligence were noted. In a speculative article (3) Saffiotti points out the relations between experimental psychology and pedagogy. Although pedagogy may draw largely from the findings of experimental psychology, the author points out that the two sciences are by no means to be confounded. In another paper (7) Saffiotti outlines a program of problems to be attacked by experimental psychology. His concept of experimental psychology is very broad indeed and includes not only social psychology but also sociology. In all, 23 groups of problems are indicated, ranging from instincts to reflection. As an example of the inclusiveness of his schema, it will be noted that under attention this author wants to investigate such topics as the influence of public opinion and the exciting of the moral sense. Another paper (8) reports the results of an experimental investigation of muscular pressure in writing numerals in arithmetical problems. This work is an extension to numerals of the researches of other investigators upon writing. A Marey tambour with graphic methods of registration was employed. Some characteristics of the amount of pressure used in making the different strokes of the numerals in the different arithmetical processes are pointed out.

Saffiotti (13) suggests a classification of the form of the verbal association reactions. This classification calls for 14 categories into which the words fall. We find this classification very much more logical than psychological. A series of verbal association reactions are classified in accordance with this grouping. The author also reports (12) a new form of electric voice key to be used in verbal association reaction experiments which seems to have a great deal of merit. Two papers (4, 6) are given over to a laudatory summary and review of the published works of Zaccaria Treves. The relation of Treves' work to experimental psychology and pedagogy are indicated.

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BOOK NOTES

A child welfare research station. Bulletin of the State University of Iowa, n. s., no. 107, Jan 15, 1916. 18 p.

Professor Seashore and his associates may well congratulate themselves on this station and the generous support that the state intends to give. Such an institution has long been a crying need, and there are those who have felt it one of the leading desiderata in our day. The study of children has already a vast body of literature to its credit and has steadily improved its methods. This institution proposes not to lose sight of the practical side of child study and we understand will select special and very definite problems for intensive research.

Development of personality; a phase of the philosophy of education. By BROTHER CHRYSOSTOM. Philadelphia, John Joseph McVey (c. 1916). 379 p.

This volume presents some of the pedagogic aspects of an institution which for twenty centuries has devoted itself to the highest aim of teaching, which is to bring to fruition the noblest powers and capacities of human personality, and to hold in check those tendencies that militate against this purpose. It is dedicated to religious teachers. The first part discusses the normal school, the religious novitiate and the personality of the teacher; the second is devoted to faith, the third to its practical value, the fourth to meditation, the fifth to the sociological aspects of faith.

Laws of physical science; a reference book. By EDWIN F. NORTHROP. Philadelphia, J. B. Lippincott Co. (c. 1917). 210 p.

Exact knowledge consists of accumulated facts and sets of formulated propositions respecting facts. The data of physical science are accessible in various published tables of physical constants but there has been no handbook which contains a full list of the general propositions or laws of science, and it is these this work proposes to give. It divides its data into the following six heads: Mechanics; Hydrostatics, hydrodynamics and capillarity; Sound; Heat and physical chemistry; Electricity and magnetism; Light. The work is attractively bound in flexible covers.

Standard method of testing juvenile mentality by the Binet-Simon scale with the original questions, pictures and drawings; a uniform procedure and analysis. By NORBERT J. MELVILLE. Philadelphia, J. B. Lippincott Co. (c. 1917). 142 p.

Here we have another discussion of the Binet-Simon scale. It is designed for examiners using this scale, and emphasizes a number of important points frequently not fully apprehended by users of mental tests. Part I discusses the general procedure in gathering and analyzing the data; Part II discusses the uniform method of applying the Binet-Simon scale. There is an appendix on tests above fifteen, scales for marking drawings, etc. The work is pretty fully illustrated.

School and college credit for outside Bible study; a survey of a non-sectarian movement to encourage Bible study. By CLARENCE ASHTON WOOD. Yonkers-on-Hudson, World Book Co., 1917. 317 p.

The author first discusses cooperation between state and church, then the advantages of the plan, the plan as related to higher and secondary education, adaptations in the central states (eastern and western divisions), a Kansas proposal, a Canadian situation, action of educational and religious organizations, questions of legal and sectarian difficulties, and the mode of procedure. In an appendix he prints various syllabi, North Dakota, Colorado, Oregon and Virginia.

A student in arms. By DONALD HANKEY. New York, E. P. Dutton and Co. (1917). 290 p.

The author, who was killed in action on the Western front, October 26, 1916, declared that these essays owe their existence to two persons, one of whom, Mr. Strachey, writes an introduction. There are twenty chapters, including Kitchener's army, an experiment in democracy, the cockney warrior, on some who were lost and afterwards were found, the book of wisdom, marching through France, the making of a man, the honor of the brigade, heroes and heroics, the religion of the inarticulate, the indignity of labor, flowers of Flanders, etc.

English essayists; a reader's handbook. By WILLIAM HAWLEY DAVID. Boston, Richard G. Badger (c. 1916). 217 p.

This is a handbook for readers of these essayists. The author knows few things more subject to abuse than books about books. He divides his matter into the following topics: origin and early exponents; eighteenth century essayists; nineteenth century essayists (of whom he has thirteen). In the appendix he discusses the kinds of essays, minor English and contemporary essayists.

An inductive study of standards of right. By MATTHEW HALE WILSON. Boston, Richard G. Badger (c. 1916). 321 p.

After surveying the field, the author discusses in separate chapters the teacher, the pupil, physician, lawyer, clergyman, editor, banker, trade, corporations, labor unions, insurance, women in business, political parties, municipal control, parents, children, the city and farm, charity, the criminal, the saloon, mental, emotional and volitional hygiene, play, manners, the friend.

Report of the Commissioner of Education for the year ended June 30, 1916. Washington, Gov't. Printing Office, 1916. 2 v.

The survey of the different grades and kinds of education is full and interesting. So, too, are the special chapters on the education of immigrants, on educational surveys, extension, museums, Young Men's Christian Association, educational boards, foundations and associations.

Report of the Secretary of the General Education Board, 1915-16. New York, General Education Board, n. d. 86 p.

This report is a model of succinct statement covering a vast body of work, with the treasurer's report at the end, with maps to show the distribution of the various aids.

Bulletins of the Bureau of Education. Washington, Gov't. Printing Office.

1916, No. 2. *Rural and agricultural education at the Panama-Pacific International exposition.* By H. W. FOGHT. 112 p.

- 1916, No. 34. *Service instruction of American corporations.* By LEONHARD FELIX FULD. 73 p.
- 1916, No. 35. *Adult illiteracy.* By WINTHROP TALBOT. 90 p.
- 1916, No. 36. *Monthly record of current educational publications; December, 1916.* 22 p.
- 1916, No. 41. *Agricultural and rural extension schools in Ireland.* By A. C. MONAHAN. 38 p.
- 1916, No. 46. *Recent movements in college and university administration.* By SAMUEL PAUL CAPEN. 60 p.
- 1916, No. 47. *Report on the work of the Bureau of Education for the natives of Alaska, 1914-15.* 85 p.
- 1916, No. 48. *Rural school supervision.* By KATHERINE M. COOK and A. C. MONAHAN. 63 p.
- 1916, No. 50. *Statistics of state universities and state colleges for the year ended June 30, 1916.* 15 p.
- 1917, No. 1. *Monthly record of current educational publications. January, 1917.* 23 p.
- 1917, No. 6. *Educative and economic possibilities of school-directed home gardening in Richmond, Indiana.* By J. L. RANDALL. 23 p.
- 1917, No. 7. *Monthly record of current educational publications, February, 1917.* 21 p.

Tentative outline of proposed educational code for the state of Colorado (revised to December 1, 1916). Denver, Civic and Commercial Association, n. d. 30 p.

Report on speech defectives in the St. Louis Public Schools. By J. E. W. WALLIN. (Repr. from Annual Report of the Board of Education, 1915-16, p. 174-211.)

Pais. Vol. 1, no. 1. Edited by Dr. A. Van Voorthuijsen. Groningen, January, 1917. 16 p.



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THE EFFECT OF TOBACCO ON MENTAL EFFICIENCY

By WILLIAM H. BURNHAM, Clark University

A few years ago Dr. Storey, then Secretary of the American School Hygiene Association, asked me to suggest some speaker competent to discuss impartially the effects of tobacco. His feeling was that any man who used tobacco was likely to be biased, and that one who had specially committed himself against tobacco could not present the subject fairly. Whether or not he has yet found a way out of his dilemma I do not know, but the noteworthy fact is that he found such a difficulty.

The writer personally has no very strong bias, and so what is said may be unsatisfactory to both sides. Nevertheless, counting on a liberal attitude in my readers, I shall attempt the task and will ask suspense of judgment until the facts are presented.

First of all it should be noted that some of the popular notions and some of the experiments in regard to the use of tobacco are to be taken critically. A large amount of partly scientific and pseudo-scientific work has been done; and even much of the painstaking experimentation of scientific men has not sufficiently considered the mental factors involved. But it is now a well recognized principle that in all investigations of the effect of drugs, special care must be taken to rule out the effect of suggestion, using control mixtures wherever possible so that the observer will not know whether he is receiving the drug or not. Experimentation that does not consider this is unreliable.

A good illustration is to be found in the book by Mary Foote Henderson on the "Aristocracy of Health, (8^a)."

She cites experiments performed by Dr. Schall at the Hahne-mann Hospital in New York, for testing the action of tobacco on the heart. A young lady was found willing to submit to the test, a perfectly healthy woman 32 years of age. Pulse tracings with the sphygmograph were taken while she smoked cigarettes. The normal pulse, according to the report, was thoroughly strong and regular, but the tracings after smoking fifteen minutes showed irregularity, and after thirty-five minutes great irregularity and excitation, while after forty-five minutes the heart beat was extremely rapid and irregular and weak. In the case of such experiments we seldom have a full report of the conditions, and hence do not know whether the effect reported is due to the thing tested or to something else. In this case the report gives naïvely enough what was said by the Doctor during the experiment. The following is the account as cited by Miss Henderson.

"The doctor instructed Miss H to inhale the smoke.

"'Inhaling is a separate vice in itself,' says he, 'and cigarette smokers say they do not enjoy these little coffin nails without inhalation.'

"While the doctor told stories of tobacco pulses in confirmed smokers, during which time Miss H. puffed the smoke from her mouth, he mentioned that a pulse of over 90 is common among smokers, and often runs to more than 100.

"At the end of fifteen minutes Miss H. had managed to smoke the halves of two cigarettes. 'There is the effect already,' said one of the doctors, 'you can see it is beginning to show irregularity in length.'

"At intervals of ten minutes during nearly an hour, tracings were made by the instrument. In each was an increasing irregularity, showing the rapid work of the cigarettes. At the end of forty-five minutes the young woman had managed to consume the larger portion of six cigarettes.

"At this time the messages on the narrow strip of blackened paper showed the heart's irregular action by short jumps and great rapidity.

"'What must be the effect on persons of weaker physique, especially those with any weakness of the heart,' exclaimed one of the doctors, 'if this effect is produced in sound health?'"

We may pass over the well known effect of one's first experience in smoking and consider merely the factor of suggestion. With many persons, perhaps with most, it would be easy to obtain the cardiac irregularity shown by these tracings merely

by the suggestion given by the stories of the physicians without the effect of nicotine at all. Such results are worthless unless they have value as illustrations of suggestion. Such a method is precisely the kind a hypnotist would use, and it would be immaterial to him whether there were any tobacco in the cigarette or not.

Undoubtedly six cigarettes smoked by a woman who had never used tobacco would produce physical effects; and yet it is not improbable if the subject had been blindfolded, and at the end of half an hour when the cardiac irregularity became pronounced, the experimenter had continued the experiment under otherwise identical conditions, actually using tobacco, but had said: "Now to show that this is not the effect of the mere act of puffing and of inhaling and exhaling in a somewhat artificial manner, we will now substitute for the cigarette with tobacco a cigarette filled with sawdust and aromatic oil," the cardiac irregularity would have subsided to a considerable degree.

Experiments on nicotine and those on tobacco should be distinguished. Experiments with nicotine have frequently been made with animals. Nice, for example, experimented with small amounts of nicotine; and the result showed that apparently nicotine somewhat inhibited growth, and that perhaps it had a stimulating effect on activity. Apparently it did not injure the health of the mice, although it did check their growth. The author notes that the variation in activity may, however, have been merely a matter of chance. Most of these experiments with nicotine do not concern us very directly here.

The question whether nicotine is actually present in tobacco smoke to any considerable extent is still in dispute. The evidence seems to be inadequate. It is possible, however, as suggested by Fisher and Fiske (4), that while nicotine may not be found in the smoke itself, it may be volatilized and absorbed to some extent during the process of smoking, before decomposition takes place.

Zhebrovski, a Russian investigator (4, p. 255), made tests with rabbits by an ingenious apparatus with which he made them smoke for a period of six to eight hours daily. Some died within a month, some became tolerant, but even those that lived showed degenerative changes, hardening of the blood vessels, and the like; and it is said that there is no difficulty in producing the characteristic effect of nicotine by administering tobacco smoke either in men or in animals.

Among the evil effects established by clinical observation in the case of heavy smokers are disturbance of the blood pressure, rapid heart action, shortness of breath, palpitation

of the heart, insomnia, blindness, catarrhal conditions of the nose, throat, and hearing, acid dyspepsia, etc.

Cannon (2) and his co-workers have shown that nicotin stimulates the adrenal glands and this influence may be partly responsible for the changes in the blood vessels noted in case of excessive smoking.

Most of the laboratory tests of the effect of tobacco on work have been of the effect on the muscular strength. The results are somewhat conflicting. Lombard, who experimented in Clark University, found, contrary to his expectation, a great decrease in the amount of work he could do with the ergograph after smoking one cigar of moderate strength. He tested the influence of smoking also on the strength of the contractions produced by electrical stimulation and found that tobacco had no effect. Hence he concluded that the depressing effect of the tobacco was on some part of the central nervous system. Harley found the effect of tobacco on himself much less pronounced than that found by Lombard; but on the whole its action was detrimental. Hough in 1901 tested the influence of tobacco on the work done by using the spring ergograph, and found the fall to the constant fatigue level took place more slowly than on normal days. Féré found the effect of smoking cigarettes to be an initial increase in the work done followed by a fall below the norm when the subject began to smoke five minutes before the experiment began. When the record was taken 15 minutes after beginning to smoke the action was purely depressing.

Rivers made tests for a short period on two subjects and found that "on the whole a smaller amount of work was done on the days on which the cigars were smoked than on the intervening normal days."

So far as I am aware no experiments altogether satisfactory have been made, but the results seem to indicate that the effect is a tendency to decrease the amount of physical work. The effect produced by the pleasurable and stimulating effect of smoking seems to be inhibited by the effect of some toxic substance.

EFFECT ON MENTAL WORK

As regards the effect of tobacco on mental work there are individual differences. The smoking of a cigar seems to have the effect of stimulating the association processes for a certain time in the case of some individuals; and not in case of others.

Few experiments of the effect of tobacco smoking on mental ability have been made. Clinical evidence has been inadequate also. The work by Meylan (12) and Pack (13) have, how-

ever, yielded important results. Specially interesting in regard to certain points are the tests made by Dr. Bush (1) in the University of Vermont.

Bush (1, p. 526) has attempted to study this problem of the effect of smoking on mental efficiency experimentally, testing fifteen men with a series of ten mental tests, employing the method used by Prof. Thorndike and others. He found the following results:

"(1) A series of 120 tests on each of fifteen men, in several different psychic fields, show that tobacco smoking produces a 10.5% decrease in mental efficiency.

"(2) The greatest actual loss was in the field of imagery, twenty-two per cent.

"(3) The three greatest losses were in the fields of imagery, perception and association.

"(4) The greatest loss, in these experiments, occurred with cigarettes.

"(5) Nicotin was found in the distillates of all tobacco tested.

"(6) Nicotin was not found in the smoke of any tobacco, except that of cigarettes, and then only in traces.

"(7) Pyridine was found in the smoke of all tobacco tested.

"(8) Pyridine seems to be the principal toxic factor in the smoke."

As shown by the investigations of Bush (1, p. 523) and others, a large number of toxic substances in tobacco smoke are demonstrable. Among those already made out are the following: Furfurof, marsh gas, hydrogen sulphide, hydrogen cyanide, organic acids, phenols and empyreumatic oil, pyridine, the whole picoline series, carbon monoxide and dioxide, and possibly some nicotin.

To what extent these other toxic substances may have an influence in decreasing the mental ability we do not know. It should be specially noted, however, that the presence of carbon monoxide may be readily shown by the spectroscopic test in the blood of a man who is smoking. The amount of carbon monoxide in tobacco smoke is not definitely known. Authorities differ. If Gréhan is correct, then from 4/5 of a cigar weighing 6.85 gms., there should be obtained 499.36 c.c. of carbon monoxide. According to the estimate by Bush, if a man takes 20 minutes in smoking his cigar, then at each inhalation he would draw in 7.49 c.c. of carbon monoxide; half of the amount, *i.e.*, 3.74 c.c., inhaled is absorbed, according to Haldane. As this represents a concentration of 0.75 per cent. distinct symptoms should be produced, even though the lungs are immediately ventilated by breathing normal air; so it may

be that some of the symptoms ascribed to nicotin are due to carbon monoxide.

Berry (1) arranged a series of typewritten examples in addition. On alternate days the writer smoked one cigar immediately after dinner, taking usually about thirty minutes. Then he at once began the addition test. On days he did not smoke, thirty minutes after dinner were spent in conversation or light reading. The experiment was carried on for twenty days.

"The results of this experiment show that smoking instead of increasing the time required to perform the test had just the opposite effect, contrary to the writer's expectation, for on the average the tests were performed in seven and seven-tenths per cent. less time on the days the writer smoked than on the days he did not smoke. From day to day the effects of smoking were more marked than the effects of practice; for in every case the time required to perform the test after smoking was less than the time required for the test on the following day after no smoking. The average number of errors made in performing the tests after smoking was slightly less than those made after no smoking. However, the difference is so slight as to be almost negligible."

Some anthropometric studies play quite a rôle in the literature in regard to tobacco. The one most often quoted is, perhaps, that made by Seaver many years ago in which he presented the result of measurements of a class of Yale. He found that the weight of non-users increased 10.4 per cent. more than that of the regular users of tobacco. In growth in height the non-users grew 24 per cent. more than the regular users, and in lung capacity non-users increased 77.5 per cent. more than did the users. A class of 91 at Amherst was studied in the same way with similar results.

The fallacies likely to be connected with such arguments in regard to growth have been mentioned in connection with the effect of caffeine; but these old investigations by Seaver are continually cited to prove the retarding effect of the use of tobacco, and the argument is again presented by Mr. Taylor (17) in a recent article; so that it may be well again to recall the fact that there are about a dozen different factors which condition growth, and we cannot take any one of these, like the use of a drug, and say that any particular retardation of growth is due to that unless we are able to rule out all these other factors which may determine the growth. It is not at all impossible that in the selected groups of men at these colleges, the ones who are specially liable to acquire the habit of smoking belong to a type in most cases which is of lower stature.

These results may be significant or they may not be, because

we do not know the influence of other factors. It is generally held that the use of tobacco retards the growth of boys at the age of adolescence; but probably it would be hard to prove it from our present data.

Studies of the use of tobacco among college students have recently been made.

Mr. Clarke (3) made a study of smokers and non-smokers in Clark College. Of 211 students, 43 $\frac{6}{10}$ per cent. smoked. While the smokers exceeded the non-smokers in strength and lung capacity; in scholarship, only 18 $\frac{3}{10}$ of the smokers won honors, while 68 $\frac{5}{10}$ of the non-smokers did. The correlation here between smoking and the greater frequency of poorer scholarship is significant; but if this is quoted, as it has been, to show the evil effects of smoking, the fact that the smokers exceeded the non-smokers in strength and lung capacity should also be quoted for whatever it may be worth.¹

A more important investigation perhaps is that made by Dr. Meylan (12) on 223 students at Columbia College. The average mark of the 115 smokers for two years was 62 per cent. The mark of the 108 non-smokers was 69 per cent. Physical condition and success in athletics were also studied. The outcome of Dr. Meylan's study is summed up as follows:

Meylan (12, p. 176) notes: 1. That college students who acquired the smoking habit before entering college are about eight months older at entrance than the non-smokers, this for three reasons: (1) Because of the depressing influence of the use of tobacco on the heart and circulation and hence the retarding effect on growth. (2) The age of 17 is the time when most boys begin to smoke, and if for any reason the boy is older than the average when he enters college there is more than an even chance that he will have acquired the habit of smoking in the secondary school. (3) The type of student described above, interested specially in social life and athletics is found in secondary schools as well as in college. Three out of four such students smoke and are usually graded low in their studies. These facts would account for a higher average age among the entering freshmen who are smokers.

"2. The physical measurements of freshman smokers are slightly above those of the non-smokers, and the smokers gain more than the non-smokers during the first two years in college, except in lung capacity. These figures are susceptible of misinterpretation unless three important facts are taken into consideration. (1) The smokers are eight months older than the non-smokers; their measurements should be slightly larger

¹ This result is contrary to that found by Pack. See below.

on that account. (2) It was shown that smokers belong to a class of students having larger means and therefore a more favorable environment—better nutrition, etc.—than the non-smokers; their measurements should be larger on that account. (3) It was shown that smokers participate in athletic exercises more than the non-smokers; their measurements should be larger on that account. That the smokers are not appreciably heavier, taller and stronger than the non-smokers may be due to the depressing influence of nicotin on the circulation and the consequent interference with normal growth.

“3. The scholarship standing of smokers is distinctly lower than that of non-smokers. The intimate connection existing between the smoking habit and participation in the social and athletic activities of college life makes it impossible to determine how much, if any, direct influence the smoking habit exerts upon scholarship; but the results of this study and the similar results obtained at Clark College indicate very clearly that the smoking habit is closely associated with idleness and lack of ambition for scholarly achievement.”

Dr. Meylan's study is a good example of careful work and in pleasing contrast with most of the papers written upon this subject. His conclusions are as follows:

“1. All scientists are agreed that the use of tobacco by adolescents is injurious; parents, teachers and physicians should strive earnestly to warn youths against its use.

“2. There is no scientific evidence that the moderate use of tobacco by healthy mature men produces any beneficial or injurious physical effects that can be measured.

“3. There is an abundance of evidence that tobacco produces injurious effects on (a) certain individuals suffering from various nervous affections; (b) persons with an idiosyncrasy against tobacco; (c) all persons who use it excessively.

“4. It has been shown conclusively in this study and also by Mr. Clarke that the use of tobacco by college students is closely associated with idleness, lack of ambition, lack of application, and low scholarship.”

A study has recently been made by Dr. Pack (13, p. 337) of the University of Utah, and his results are based on information received from college and university athletic directors of fourteen American colleges and universities. The attempt has been made to eliminate errors as much as possible.

The blank forms sent out to the various athletic directors provided for the following data: age, weight, ordinary anthropometric measurements; ability on the team, whether fair, good or very good; scholastic standing of last year, including average scholarship mark, and number of conditions or fail-

ures; the number of smokers and non-smokers who attempted to "make place" on first team, together with other more or less important features. The students were also to be designated as "smokers" or "non-smokers." The following footnote appeared on each blank: "By 'smoker' is meant one who habitually smokes when not in training and not an individual who indulges at very infrequent intervals." It was thus desired that only habitual smokers be included in the list, as it is quite generally agreed that the infrequent use of tobacco is not seriously injurious.

The institutions reporting were as follows:

INSTITUTION	Smokers	Non-smokers	Total
Amherst College	9	9	18
Drake University	2	9	11
Haverford College	4	17	21
Michigan Agricultural College.....	3	14	17
Northwestern College	12	5	17
Tulane University	7	14	21
U. S. Naval Academy.....	7	5	12
University of Colorado	5	7	12
University of Kansas	10	9	19
University of Montana	12	7	19
University of Pennsylvania	12	12	24
University of Tennessee	11	10	21
Western Maryland College	7	12	19
Yanktown College	8	9	17
	109	139	248

On the item of "try-outs" six institutions reported on 210 men. Of this number 93 were smokers and 117 were non-smokers. Of those who were successful 31 were smokers and 77 were non-smokers; or, in percentages of the smokers, 33.3 were successful, of the non-smokers 65.8 were successful. That is, only half as many smokers were successful as non-smokers. The conclusion that smokers stand little chance with non-smokers in obtaining places on football teams is indicated not only by the total of the six institutions, but is similarly shown in each of the six.

The following table shows the inferiority of the smokers in each of the six institutions reporting:

Institution A	Number Competing for Places	Number Successful	Per Cent. Successful
Smokers	11	2	18.2
Non-smokers	19	11	57.9

	Number Competing for Places	Number Successful	Per Cent. Successful
Institution B			
Smokers	10	4	40
Non-smokers	25	17	68
Institution C			
Smokers	28	7	25
Non-smokers	17	14	82
Institution D			
Smokers	28	11	39.3
Non-smokers	15	10	66.6
Institution E			
Smokers	10	7	70
Non-smokers	15	12	80
Institution F			
Smokers	6	0	0
Non-smokers	26	15	57.7

"The athletic directors of the various institutions were asked to divide their men into the classes, fair, good, and very good. This classification was to be based upon the ability of the men as all round football players." The rating of their coaches indicated the superiority of the smokers.

Thus it appears from the figures that smokers make the better football players, but it should be noted that this result is not uniform when the institutions are considered separately, and more important perhaps is the fact that as only half as many smokers as non-smokers were successful in the "try outs," only the best smokers were chosen while with the best non-smokers a group of second grade men were included. And again, it is stated that of two men a smoker and non-smoker of equal ability at the beginning of training, the smoker will develop into a better player than the non-smoker, because the non-smoker before training is much more nearly at his best than the smoker. Of course when the smoker begins training he has to stop the use of tobacco and he has a much better chance for improvement than the non-smoker.

In each of the 12 institutions it appears that as regards scholarship the smokers average below the non-smokers.

For an equal number of students:

	Highest Marks	Lowest Marks
101 non-smokers furnish	11	6
101 smokers would furnish.....	5	15

"Smokers would accordingly furnish 71 per cent. of the lowest marks, and the non-smokers only 29 per cent. The

smokers would furnish 31 per cent. of the highest marks, and the non-smokers 69 per cent."

"The smokers furnish twice as many conditions and failures as do the non-smokers."

In respect to lung capacity, the smokers of the same age as the non-smokers and 3.3 pounds heavier had a lung capacity 7.3 per cent. smaller. As the smokers were heavier their lung capacity on the other hand should have been greater. It appeared that the smokers showed a decidedly less lung capacity in each of the institutions reported. For six institutions Pack reports:

"Non-smoker's lung capacity at 159.6 pounds is 308.9 cubic inches.

"Smoker's lung capacity at 162.9 pounds is 286.3 cubic inches.

"Smoker's lung capacity at 162.9 pounds should be 315.3 cubic inches.

"Smoker's loss in lung capacity is 29.6 cubic inches, or 9.4 per cent."

"The following suggestive points are brought out in this investigation:

"1. Only half as many smokers as non-smokers are successful in the 'try outs' for football squads.

"2. In the case of able-bodied men, smoking is associated with loss in lung capacity amounting to practically ten per cent.

"3. Smoking is invariably associated with low scholarship."

The specially significant correlation in this study by Pack is that of the lower lung capacity among smokers. That this should be found in all of the half dozen institutions reporting is a specially significant thing which should be further investigated.

In regard to the number of children who use tobacco and the effect of this habit we have no adequate data. Both here and in other countries the number seems to be large.

Investigations in Germany (15) made in the city of Fürth in the year 1907-8 show that of 1,255 children not less than 54.5 per cent. had already smoked.

In a school at Magdeburg of 742 children it was found that 306 or 41.2 per cent. smoked. Extended investigations in the Netherlands (12a) concerning 24,789 boys showed that 25 per cent. smoked occasionally, 17 per cent. regularly, and 2 per cent. chewed tobacco. Of 5,689 boys at the age of 5 to 7, 1,162, that is 21 per cent. smoked frequently, and 7 per cent. regularly. These were described as stupid and inattentive, and the worst pupils of the class.

In Germany perhaps more care is taken to keep young children from smoking than in this country, and possibly the same is true in some other countries where smoking is almost universal; but these efforts are evidently not always successful. The teachers in Heereveen, in Holland, have studied the smoking among the children and sent a circular to the parents in regard to the matter. The investigation showed that the boys in three of the elementary schools smoked tobacco regularly, especially in the form of cigarettes. In the higher classes, where the children were from 9 to 13 years of age, all the boys with a few exceptions smoked. In the lower classes smoking was less frequent. The teachers called the attention of the parents to the fact that the use of tobacco is very injurious to children and that it especially affects the mental development. And they urged parents to forbid the use of tobacco to their children and punish them if they did not obey. The physicians there also most strongly condemn all smoking by children.

In some parts of this country the habit of taking snuff and chewing tobacco is common even among quite young children. A study made by Professor C. W. Stiles and S. B. Altmann (16) gives a noteworthy example of this.

In taking the clinical reports of 179 children between the ages of 8 and 18 nearly all of them in attendance in seven schools in County Z in one of the South Atlantic States, they asked the children whether they dipped snuff, and whether they chewed or smoked tobacco. Of 69 boys for whom data were available 18 admitted the use of tobacco, and of 59 girls 13 admitted the use of tobacco. Thus of the 127 boys and girls for whom records were available 24 per cent. admitted the use of snuff or tobacco.

The authors report that they had "met children as young as four years who either dip or chew." The folk belief that tobacco is a preventive of anemia is taught at various points in these states, and the authors add "there can be no question that it has received professional sanction from the more ignorant of the rural physicians."

It is not, however, a question of a mere isolated idiosyncrasy, but is a result of a condition of general low sanitary and social environment, this habit being correlated with other unsanitary conditions. A single case may be cited as an example of what is liable to occur.

One case, of a girl 13.7 years old. She dips snuff and chews tobacco. She is only 4 feet $3\frac{3}{4}$ inches in height, standing (barefoot), weighs $64\frac{1}{2}$ pounds (barefoot, no coat), has a hemoglobin of 75 per cent. of normal, a red blood count of

3,448,000, an eosinophilia of 32 per cent., and is a very typical case of hook-worm disease of long standing. Her apparent age is about 8 years. She does not remember when she began to dip and chew, but as nearly as even approximately correct deductions could be drawn from her statements she probably began the habit when she was about 4 to 6 years old. Now, at the age of 13.7 years, she is distinctly a heavy chewer, as are also her father and 11.6 year old brother. According to her definite statement she began the use of snuff and tobacco upon the advice of her family physician as a preventive against growing pale (namely, in this instance undoubtedly hookworm disease) and apparently this advice was given not later than 1905, namely, 7 years ago."

Sandwick (14) reports a study of high school students, which considers especially the habit of smoking in relation to the grades received. He says:

"Of the ninety-four upper-class boys, thirty-eight were found to be habitual smokers; thirty-six never had smoked; and twenty had formerly smoked more or less; but had abandoned the habit. Their grades are as follows:

Non-smokers	83 per cent
Habitual smokers	76 " "
Reformed smokers	79 " "

"The marks in each case are an average of all the marks received by that group of students while in the high school."

"Of the sixty-two first-year students, seventeen were found to be habitual smokers, forty-one never smoked, and four had given up the practice. Their grades when averaged were as follows:

Non-smokers	84 per cent ..
Habitual smokers	76 " "
Reformed smokers	82½ " "

Mr. Gosling (8, p. 693) has made a study in a large high school of the Middle West of the use of tobacco among 103 boys of the senior class. There were friendly relations between the instructor and pupils, and the answers were probably truthful. They were secured also by personal interview with each boy. There were 58 non-smokers and 45 smokers. The scholarship of the non-smokers seemed slightly better; that is, it was 1.9 per cent. higher in the general average than for the smokers. The results are not striking and the number studied was too small to warrant any positive conclusions, but the investigator rightly suggests that there may be "some common cause out of which issue independently both smoking and low

scholarship. There comes a time to many boys when they no longer hold themselves to such strict adherence to their ideals as formerly; when they do not keep as firm a grip upon their conduct; when they do not hold themselves to such strict accountability; when they allow a certain relaxation of self-control. May not this lowering of personal standards of conduct, this relaxation of self-control, account for the habit of smoking, for low scholarship, and perhaps for other unfortunate habits of boys? If this be true, we are face to face again with the old problems. How can a boy be taught self-control? How can high ideals be made the ruling principles in the life of a boy?"

Some investigations of the effect of tobacco upon the health of school children have been made. Mr. Charles Keene Taylor (17, p. 159, 160) reports an interesting study made at the Germantown Academy in Philadelphia. He examined the records of over 500 private school boys between 12 and 17.

"It was found that 15 per cent. of the twelve year old boys, 20 per cent. of the thirteen year old, 38 per cent. of the fourteen year old, 29 per cent. of the fifteen year old, 57 per cent. of the sixteen year old, and 71 per cent. of the seventeen year old boys were either regular or occasional smokers. Now follow the grades for these boys, contrasting those of the non-smokers with those of the smokers. These grades were averaged from their school reports for three successive months, and included marks for lessons as well as for conduct.

Age	12	13	14	15	16	17
Grade, non-smokers	83	90	89	84	87	85
Grade, smokers	73	75	75	73	75	68

"A study was made of the 'disease records' of these 262 boys. The total percentage of smokers was 30.4 per cent. Now if smoking had no effect, we would be likely to see the proportion of smokers having had 'stomach trouble' to the non-smokers having had the same disorder to be the same as above, that is 30.4 per cent. The records show that of the boys having 'nervous disorders,' all, that is 100 per cent., were smokers. Of all having 'stomach troubles' 71.4 per cent. were smokers. Perhaps this was caused by swallowing smoke and nicotin-laden saliva. Of those having typhoid-pneumonia, 50 per cent. were smokers, the same is true of appendicitis. Of all who had diphtheria, 38.5 per cent. were smokers, and of those having disorders in the naso-pharynx 37 per cent. were smokers. These percentages, you will note, are all larger than the legitimate proportion of 30.4 per cent. as noted above. It is only when we consider the common diseases of early child-

hood, which come before the 'smoking age,' that we find the proportion 30.4 per cent. as one would suppose."

We should note in all these studies that a correlation does not necessarily indicate a causal relation. For example, there seems to be, according to the investigations of Pack, a high correlation between smoking and inferiority in college work. This, however, may be due to the fact that those who are especially interested in scholastic occupations have less interest for smoking and the like; while those who have relatively little interest in scholastic occupations are interested in many other things which are naturally associated with smoking. The difference between a correlation here and a causal relation may be made clear by a concrete illustration. Professor Eucken of Jena, Germany's leading philosopher, unlike most Germans, does not smoke. We can just as well argue that his superior ability and superior interest in scholastic matters is the cause of his not smoking as that his not smoking is the cause of his superior intellectual ability.

As regards the relation of smoking to efficient brain activity, the evidence so far is rather slight. Probably there are great individual differences. The work of Bush (1) indicates a distinct decrease of the mental ability as the result of smoking. While the evidence does very strikingly suggest that smoking may be injurious physically by checking the development of the lung capacity, and while there is apparently a correlation between smoking and inferior scholarship; on the other hand it should be noted that the advantage of smoking is to be looked for distinctly in the mental field, and this is not a factor to be underestimated. The attitude of mind associated with the habit of smoking is one of calmness and serenity; and at all events, the habit of smoking in moderation is usually connected with the habit of taking short periods of rest several times during the day, a habit of relaxation and of freedom from worry, distinctly helpful for the brain worker.

The effect of tobacco on the brain, or more particularly perhaps, the effect of nicotin on the brain, is first stimulating and then depressing. The stimulating effect passes off very quickly, so that it is to be considered as a depressant. Thus the effect of nicotin, not to mention the possible effect of the other injurious substances in tobacco smoke, is distinctly injurious to mental work. Usually the argument stops here, but the whole matter is by no means as simple as this.

Apparently in the case of many persons the sensation from smoking tobacco becomes a conditioned stimulus for mental activity. This may explain the fact that while Bush found a decrease in the mental ability after smoking, Berry found the

mental activity improved. It is well known that many people can do better mental work while smoking than at other times; and for many persons smoking makes a condition favorable for calmness and clearness of thought. These are well known facts. The reason apparently is that the sensations from smoking become associated with other stimuli and form a conditioned stimulus. Sensations from tobacco smoking seem very easily thus to associate themselves and become conditioned stimuli for many conditioned reflexes. For example, we have in case of certain persons a purely physiological conditioned reflex in connection with the evacuation of the bowels. For normal action of this kind such persons are dependent upon a cigar, which clearly acts as a conditioned stimulus.

Apparently in the case of many persons the sensation from smoking tobacco not only becomes a conditioned stimulus for mental activity, but in some situations at least, a most important condition for such activity, and, where an individual has been for a long time habituated to the habit of smoking, brings up many associations. Thus the soldier in the trench who has plenty of cigars and cigarettes finds his lot lightened by many of the feelings of calmness and familiarity that are connected with the smoking habit when at home. But on the other hand serious results of excessive smoking in the trenches is reported.

Again in case of some persons the tobacco as a conditioned stimulus seems more important in bringing about these feelings of calmness and at-homeness than the unconditioned stimuli which originally brought about such feelings. For example, many an habitual smoker feels far more satisfied and contented to be out-of-doors in a disagreeable storm with the opportunity to smoke than to stay in a luxurious parlor and abstain.

Certain studies have been made by von Fränkl-Hochwart in regard to the effects of smoking on the nervous system. Among 750 smokers who were studied by him one-third had more or less grave disturbances due to nicotine. Further, he reports in regard to over 700 cases of excessive smokers suffering from nervous diseases in the case of whom other poisons were ruled out. More than one-fifth of these had headache of a diffuse character, and even a genuine nicotine migraine seemed to occur. Many complained of buzzing in the ears, but more frequently there was dizziness. Not infrequently they complained of sleeplessness. Very often they suffered from anomalies of mental condition in the form of depression and conditions of anxiety. At a later age noteworthy weakness of memory sometimes occurred, and sometimes a certain limitation of the mental horizon. Actual nico-

tin psychoses seemed also to occur. Not infrequently there was genuine syncope, and early apoplexies also occurred. Further Fränkl-Hochwart, on the basis of five cases observed, made a diagnosis of nicotin epilepsy.

The nicotin tremor was seen in only one-tenth of the cases and was never excessively great. Nine times a tic-like twitching was observed. And further, the frequency of nicotin abuse as a cause of writer's cramp was indicated.

Fröhlich has studied the toxology of nicotin and tobacco smoking. For the judgment of the poisonous effects of tobacco smoking nicotin alone is to be considered. The mild form of acute nicotin poisoning is characterized as a transient excitation of the central nervous system, that is, of the sympathetic and autonomic system. In the case of experiments with nicotin poisoning there occurs an excitation of the center of respiration with paralysis succeeding this. And further there is an excitation of the nerves of the heart, the autonomic vagus nerve and the sympathetic accelerant nerve. The seat of the cardiac excitation is central and peripheral. Nicotin has a very strong effect on the arterial blood vessels as well as on the vasomotor center.

The evil effect of tobacco, if there is such, is that of a slow poison which tends gradually to undermine the health and lessen the ability to work. That is, its effect may be to lessen the efficiency of the nervous system after prolonged use. In regard to all this we know very little; but some facts of observation are significant. It is reported that the athlete finds it hurts his wind, hence tobacco is forbidden to athletes in training. The expert billiard player and the expert rifleman report that their shooting is more accurate when they do not smoke. That is, the effect, if we may trust these reports, seems to be to lessen the keen edge of intellectual as well as physical performance.

Recent studies furnish corroborative evidence. Dr. Fisher and Professor Berry have reported the results of experimental investigations by different students which, though tentative, they say are "remarkable for their uniformity and general consistency, showing that smoking raises the heart rate and blood pressure, that it markedly delays the return of the heart rate to normal after exercise and that it impairs the neuromuscular control as indicated by delicate finger exercises and gross muscular coördinations."

It should be remembered that there is no question of the injurious effects of nicotin, pyridine, and other substances produced from tobacco. Again, there is no question in regard to the evil effects of immoderate use of tobacco. As regards

the latter point the study made by Pawinski of causes of arterio-sclerosis is significant. In 3,156 cases the author found that excessive use of tobacco occupied second place, obesity, holding first place. A history of excessive smoking was recorded in 29.8 per cent. of the cases. In 1,075 cases in which sclerosis of the coronary arteries was the most pronounced type of the disease, tobacco came first in importance as a cause, contributing to 41.9 per cent. of the cases. And when smoking was the only possible etiological factor it accounted for 19.4 per cent. of the cases.

Here again, as in eating and drinking, there are what may be called hygienic methods of smoking as compared with unhygienic. The specially unhygienic practices are those of inhaling the smoke, of smoking on an empty stomach, of using improper paper in making cigarettes and inhaling the smoke of the paper, of smoking strong cigars or cigarettes without a suitable holder, thus causing inflammation of the membrane, not to mention excess of smoking, which is obviously irritating to the mucous membrane of the nose and throat.

And there are of course other aspects of the tobacco problem with which we are not concerned here, considerations, economic, social and ethical. All these are aside, however, from our special problem.

Mr. Manuel (10) in *School and Society* discusses the problem whether the college smoker is a worthy social institution or not, and comes to the conclusion on the whole that it is not. The criticism apt to be passed on any such study is that the outsider who studies such a question does not consider sympathetically the social aspects of his problem.

Perhaps a more important problem to-day is that presented by the economic side of the question. When in a crisis like the present every form of unnecessary expenditure makes the conditions of life harder, and actually tends to help the enemy, in an indirect way it would seem specially desirable that at least all those who have never acquired the habit of smoking should abstain, and this would seem the more desirable from the fact that it is not difficult to substitute other means of personal and social recreation; and just as the English are giving up their personal conveniences and luxuries for the sake of aiding the government, it may be said that the least one can do is to avoid acquiring habits which may mean unnecessary expenditure.

The teacher and the reformer, however, are very apt to lack proper perspective and to give instruction that is not altogether truthful. The boy or man who uses tobacco is represented as

lacking in physical health and development and in any case as being at least a waster of the goods of life, if not depraved. One speaker at the Buffalo Congress of School Hygiene (11) pointed out that the greatest conflagration of modern times is that which results in the mighty volume of smoke belching forth from the mouths and nostrils of 20,000,000 men and boys living within the confines of this enlightened American commonwealth. It destroys more wealth in a year than the great and destructive fires that have occurred in this country during the past three-quarters of a century. Then he adds a table of great fires ending with that of San Francisco with a loss of 400 million dollars, but the loss from the tobacco conflagration in 1912 was a loss of 1200 million dollars. And further he points out that this would buy 300 loaves of bread for every man, woman and child in the country.

It may be noted that the amount of money spent for tobacco in this country, especially for cigarettes, has increased in recent years. According to the estimate of Prof. Farnum (4a) the annual cost for tobacco used in this country is \$1,200,000,000.

Undoubtedly important economic and moral considerations are involved here. But in giving instruction of this kind to boys and girls it should at least be accompanied by the statement of similar facts in regard to the waste from over-eating and in regard to the use of candy adulterated with poisonous material. It would be quite possible perhaps to show an equally great economic loss, not to mention the injury to health, from such sources.

Where instruction is not given in right perspective and is not truthful, boys and girls are likely soon to see the fallacies involved and then perhaps may reject even the truth presented in connection with the fallacies. The fundamental consideration in giving instruction in hygiene is to present the truth; and if possible to give training in right activity in view of the knowledge we have.

The evidence thus far indicates that: 1st, excessive smoking is injurious; 2nd, that moderate smoking apparently does not injure most mature adults.

3. In many cases, especially where smoking is excessive, an injurious effect on the mucous membrane of the throat and nose seems to result. Especially if one has any tendency to trouble with the throat or naso-pharynx the habit of smoking seems likely to be injurious.

4. Smoking is correlated with somewhat inferior lung capacity in athletes.

5. Smoking is correlated with inferior scholarship.

6. As regards causal relations the evidence justifies no sweeping assertions.

7. Smoking decreases the ability to do muscular work in some individuals.

8. Under the conditions of Bush's experiment, smoking decreases the ability to do mental work.

9. In the case of children the evidence seems to be that the use of tobacco is distinctly injurious.

10. Excessive smoking or excessive use of tobacco in any form is especially injurious to the nervous system.

11. Many different poisons have been found in tobacco smoke, the most injurious of these perhaps being nicotin, pyridine, and carbon monoxide. Many studies have shown the extremely poisonous effects of nicotin when absorbed.

12. The primary effect of nicotin on the nervous system is stimulating. The secondary effect is depressing. The stimulating effect is so short that the drug is to be considered distinctly a depressant.

13. Whether or not smoking is physically injurious or detrimental to mental efficiency seems to depend upon the individual, the amount of indulgence, and the manner in which one smokes.

14. Moral, social and economic considerations perhaps, quite as much as hygienic, should determine the desirability or undesirability of the use of tobacco.

15. The favorable effects from tobacco smoking, once the habit is established, seem to come chiefly from the conditioned reflexes formed.

The practical question for mental hygiene is a part of a much larger problem, namely, how far is it desirable to make one's mental activity dependent upon artificial conditioned stimuli. Or, if you prefer, in the words of the older moralists, how far is it desirable to become the slave of habit.

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CONVENTIONAL AVERSIONS VERSUS FUNDAMENTAL ERRORS IN SPOKEN ENGLISH

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I

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"No level'd malice infects one comma"

It is possible that, first and last, too much has been written about the "Bad English" of students. Undoubtedly a very great deal of it makes thin reading, and is the worse for sounding petulant. The concern manifested relates fundamentally to conditions rather than to the causes of them; and the dominant querulous note suggests overwrought nerves, inadequacy, bewilderment, et sequitur, rather than analysis and adjustments under way. It certainly has been given too much scope. Distress of any sort made a staple theme rapidly becomes profane. There is probably also some basis for the charge that much of our striving looks toward establishing our taste in sweetmeats as the norm, the proper goal for our students. Indications are not wanting of an ideal which, if it could be imposed on students, would "produce singularity or perpetuate idiosyncrasy." This too, is a lode that soon peters out, as caste ideas will in a democracy. Less working of it would surely not have meant any loss of essential capital to the cause of "Good English." Finally, to round up a somewhat hazardous comment, one suspects that too much of the effort of the complainants may have been directed to *conventional ends* that are relatively unimportant, in the lower schools at least; that represent largely only a school, or even only a department, standard. Of this more will need to be said later. On the whole (there are notable exceptions of course) the reading of a hundred or so of magazine articles pertinent to the topic in question suggests that the field really possesses greater variety than the articles admit. One does not feel set ahead in proportion to the effort put forth.

Probably the magazine articles may fairly be supposed to indicate in a general way the problems felt by the teachers of English. Courses of study might be presumed to indicate

somewhat clearly the current practice. It would be well if one could look to them also for some statement of their underlying philosophy, their principles, even though these were only an expression of their sense of "oughtness." It is doubtful, however, whether they can confidently be relied upon to do even the first,—though there are no good reasons why they should not. Very few indeed make any serious effort to do the second. They appear to have been somehow conventionalized—so that too often they are as useless for specific quests as are the Annual Reports of State Superintendents of Education or of charitable agencies in New York City.

Nevertheless, certain useful information which they do not plan to give, can be had from an examination of them. Among other things, they are very closely alike from coast to coast, in city and country, in homogeneous and in mixed populations. Their list of "errors" is almost stereotyped, and in the main the separate items thereof are apparently regarded as of about equal importance. They do not do justice to the considerable variety of English, both good and bad. In general, they unhesitatingly assume their possession of all necessary data; that their main problem is one of drill for the correction of a standard series of errors. Usually they do not give evidence of having considered the implications of the errors in question; nor do they frequently offer any suggestions on method. Instead, they as a rule merely assure the reader cheerfully of certain laudable performances: for instance, "*Children are helped, as needs arise, in idioms and the forms of oral composition;*" "*Much attention is given to oral composition in this (the second) grade;*" "*Most spoken errors are corrected at once in a manner to avoid distraction from the thought.*"—so speaks one of the best elementary school courses.

It is of course possible that a very great many elementary school teachers know at once when "needs arise," and are so facile in the "forms of oral composition" that they can give potent help readily. The distinction between "oral composition" and extempore speech in class may not be worth making in the second grade. It would certainly, however, be useful to know how to correct "all spoken errors at once in a manner to avoid distraction from the thought." In fact many of the assurances given in courses of study have to do with matters of such difficulty as to divide the reader between wonder at the corps of teachers who can do such work, and skepticism about the sincerity of the course. We should amiably admit that a course of study ought to be better than the daily practice of the school for which it is made (assuming for the

moment that courses are made for particular schools); but we do not thereby relinquish our conviction that it should make no pretenses. Its phrasing should enable one to separate its working plant (so to speak) from its contemplated extensions.

On the whole, we may summarize, courses of study in English provide a somewhat comprehensive marshalling of the standard theoretic and practical formulae of textbooks on composition and rhetoric. They suggest rather a careful survey of other printed asseverations about English and its ways than a thoughtful evaluation of the matter involved for a certain limited number of school years, a certain selection of pupils, and the like. Almost any course of study, we venture to generalize, if carefully examined in connection with inspection of class work, will focus attention upon several interesting matters: for example, the perfunctoriness of its *a priori* analysis of the field of probable error; the conventionality of the underlying conception of the function of a course of study; the discrepancy between promise and fulfillment; and the like.

The problems of "corrective" English are no doubt in part general—that is, not local; and it is accordingly to a certain extent feasible to block in the field of probable or possible errors, though even the most careful *a priori* analysis is certain to be notably incomplete. What is not feasible is *to give in this way a functional distribution of emphasis*. The very best of such efforts will inevitably exhibit defects due to preconceptions about the scope and kind of errors and about the proper emphases,—is certain in this or that place to be relatively inapplicable. The difference between good English and standard English (clear colloquial versus literary) is more than likely to get ignored in such procedure. The latter usually dominates corrective work. Wherever this happens the labor of the teacher will justly seem to the student to be merely hobby-riding. It will lack reality and will therefore signally fail. As examples of such unreality, consider the very common insistence that the pupils shall always respond to questions with complete statements; that slang is always to be repressed; that errors are always to be corrected at the time when they occur; that incoherent speech is to be checked in mid-course or earlier; and so on. These are all more or less obstructive precepts such as can be safely given out only under the most heavenly conditions. No one who thinks twice about the matter wishes class work to be wholly artificial. What is the practice of educated people? is a pertinent question to ask of those who would or do set up such standards.

It is surely not anything like the standard of those who make such demands as these of pupils. Very often, to cap the question laconically is much better than to frame a complete statement. Always to respond to questions with full-fledged statements is to do what nobody alive does under normal circumstances. On occasion slang is the properest possible mode of expression. If errors were all corrected as they occur many a capable student would find all avenues of growth except one relatively unimportant one inexorably closed. And finally, incoherent statements are sometimes the only sort that can be had or made. Knowledge comes bit by bit, not all at once. Much of it is born in the struggle to do something with incompletely co-ordinated brain and vocal organs. In a stimulating class young people must frequently be incoherent. They cannot anticipate all the ramifications of ideas. Every good class will offer opportunity for active struggle and the various stumbling explorations of incompletely equipped discoverers. Even incoherence of the degree describable as both visible and audible may be an expression of a hopeful state of mind, doubt and struggle signifying reconstruction in process. In a class devoted to rote work there of course need be none of it. In a class which is thinking there will always be some of it. It is important to receive it as a sort of advance agent of the orderly discourse of the expert speaker.

In a word, so far as we can determine from a generous (but perhaps not wholly representative) sampling of magazine articles and courses of study, "English" in all its aspects appears to have resisted the modern pragmatic tendency in Education about as successfully as have the other school studies. At every stage of school work the beginnings of necessary reconstructions have been made. For the orientation of college and senior high school teachers a number of outstanding articles exist,—notably those by Baldwin, Aydelotte, Steeves, Baker, et. al. (See, for examples, the *Cyclopedia of Education*: articles on *Composition* and *Rhetoric*; *The Educational Review*, 1911, *English as Training in Thought*; 1914, *The College Teaching of Rhetoric*; and so on). In this higher field fresh analysis of the problems and a clearer eye for prospective methods have recently while exhibiting pretty fully the inherent difficulties of the work at the same time opened up vistas to the teacher.

In contrast to this situation, the lower reaches of school work are much less well provided for. The few analyses relevant here have not been brought together; for various reasons the problems in this field have not been stated with like approximate completeness. A certain trend is nevertheless dis-

cernible in the work that has been done. Slowly supplanting formal grammar, "corrective" or "technical" English, intended to compel a functional selection of subject-matter, has become somewhat common in elementary school programs—often, however, in situations in which the teachers are not equipped to make the underlying philosophy fruitful. The early manuals of the San Francisco Normal School (see Miss McFadden's Bulletin on Corrective English, for example) spent their force upon method, in which they were dogmatically innovative. They apparently accepted the traditional list of "common errors:" those of the class in which rightness is a matter of usage or custom or convention. At the same time, in their preliminary expositions they illustrated the range of unconventional but (as we think) more important errors: those of the class in which rightness is a matter of logic or meaning. The brief Inventory of Language Errors by Superintendent Charles S. Meeks of Boise, Idaho (N. E. A., 1910: 435) was an important advance, the first direct attack (so far as we can find) upon the local problem, but one apparently little known. The recent investigation by Charters and Miller of the errors of Kansas City, Missouri, school children (University of Missouri Bulletin, Vol. 16, No. 2) is suggestive and therefore useful; but its results are of course not to be regarded as indicating a typical condition. The absence, from their tables, of certain of the unconventional errors above hinted at (errors which seem to belong to childhood in much the same way as its mode of learning to walk) raises a question about the thoroughness of the survey. Beyond these few published studies there is little suggestive material for the stimulation and guidance of the elementary-school teacher of English. There are no analyses of the problems of the lower schools that can be regarded as approximately as satisfactory as those mentioned above for the college and upper high school field. Standards more representative of social practice, such as a determined consideration of modern analyses of educational values should be expected to give, are needed together with (for course makers) much greater unwillingness to reiterate blanket phrases.

II

Errors Found in the Speyer School

Up to this point the persistent criticism of existing conditions may have seemed to imply a forthcoming construct to meet the situation discovered. We ought now to make clear that its intention was only to indicate in part why such a

construct has not yet appeared. What we shall do is to contribute another article to those which (as we have admitted) make thin reading. We have to report, along with some critical comments, the concrete details of an inductive study of school errors in spoken English—a study made during the summer of 1914 in a practicum conducted by Professors M. B. Hillegas and Ernest Horn of Teachers College.

In the discussions preliminary to the investigation it seemed to us that the problems of corrective English were in series about as follows: first, to know what errors occur and their frequency; second, to rank or group them somehow with reference to their importance; thereafter, to find out what they mean, how they arise, and the like; and finally, to devise effective methods of recommending the better expressions, eliminating the causes of unsatisfactory expression, building up a technique, and so on. In the present report, though we obviously have not completed even the first task, we venture here and there a little into each of the other assignments.

The shortness of the time and the difficulty of observing typical class work in the summer made it necessary to use stenographic reports on file at the Speyer School. The data collected are therefore open to certain suspicions of error, chiefly, however, in way of deficits. For example, subsequent check-observations of recitations made it clear that in spite of the stenographer's belief that her reports were absolutely faithful she had edited "They wuz" (writing "There was") a considerable number of times. Aside from this, the nature of our source of material removed from observation a class of errors which in point of prevalence should be recognized as the most important: namely, mispronunciation. The further possibility that the stenographer contributed errors of her own to the reports was considered. It does not seem likely that she did, since examples of her own spontaneous writing, which by chance were available, contained almost no errors,—none at all of the fundamental ones that recur in the reports of the pupils' recitations. This is significant, in view of the fact that nothing in the world is harder than for one who uses good English to remember or invent the phrasing of bad English, especially of incoherent sentences.

It should further be apparent at the outset that collecting spoken errors from stenographic reports must frequently be subject to the inaccuracies of personal judgment. In not a few instances it was necessary for us to formulate our own guidance. Reasons for this will be still clearer when it is realized that manuals of usage exemplify their principles mainly by excerpts from literature, rarely from colloquial

English, and still more rarely from the English of young people. The principles that one applies ought not to be left wholly implicit; briefly, therefore, we present certain considerations that bear upon such decisions as were made during the gathering of these data.

1. Oral English must be tried before (not a lower but) a different bar from that appropriate for written English. Extenuating circumstances must always be admitted. When the spoken words of pupils are written down the judgment is further complicated. It must be remembered that the *bad appearance* of sentences is not conclusive evidence against them. Their *sound* must testify also, with all the advantage that the counsel of punctuation can provide; for the exigencies of even oral composition (which is *prepared for deliberately*) demand that the speaker have somewhat greater freedom from prescription than the writer. Much more so in impromptu speaking (as in most recitations, in most class discussions, and in all conversation) must there be opportunity for freedom. There will be thinking of course, and with it reconstructions of attitudes; there will often be emotional stress, and with it a measure of headlongness; and the very effort to speak truly will often be detrimental to the form of the expression. Therefore, sentences must be heard as well as seen, in order that rough first drafts in process of revision not be measured by the standards of finished products. There is no closet for the revision of oral language. It must have freedom. Consequently its merits are not precisely those of written language.

This doctrine is as yet rather a matter of social practice than of academic theory, except among a few eminent teachers of English and in a few departments of education. The principles are capable of illustration, however, which without exhibiting the variety of the demands will make clear their dominance. When a pupil in the eighth grade says, "In my opinion John should cut it out," by the quality of his sentence he has for all reasonable people quoted the slang as effectively as is the custom to do by furtive smile or facetious intonation. When another says ironically of her class-mate's sentence (intended as an improvement of her own effort at phrasing), "I don't think that's such a grand expression either," she is of course well within the bounds kept by people of taste and education. The same judgment should hold in, "That's what I should call fancy." Note even the sentence, "After they worshipped the Horse God and the Dog God I didn't understand the rest." By the help of context, which is never lacking, we may approach the oral rendering thus: "After the sentence, 'They worshipped the Horse God and

the Dog God,'—I didn't understand the rest." The sentence is clumsy, ill-adapted to its end; but it is not incoherent, even to the eye. In brief, in the case of slang and "impropriety," and to a certain extent also in incoherence, the governing principle is simply Portia's "How many things by season seasoned are . . . !" How far we shall adopt in theory the view sanctioned in practice, that it is only reprehensible not to be aware of our "bad" English, may be a proper question, but to it no definite answer can be given. Here and there we may certainly limit its application with young people. We shall, however, only be accustoming them to recognize their lawful occasions.

2. Further, not only is a certain latitude to be accorded amiably to oral expression in general, but also to young pupils' groping for expression a large amount of charity is eminently appropriate. Fatal though the "loose and" is to consecutiveness and organization, yet the fact remains that the technique of subordination (still a problem in high school) is too difficult to be mastered early. It may even be said that the "loose and" belongs to very young people everywhere. Like baby clothes it should be laid aside eventually—but just when? And what helps should teachers give in the rehabilitation? Perhaps, for example, *The Gingerbread Boy* and other stories built on the "loose and" are not absolutely indispensable to the English work of the lower grades. At any rate, in view of all this it is probably true that I have checked this mode of expression oftener than is fair in the first four grades.

3. Again, the checking of errors demanded that two standards be constantly in use: one looking toward the function of language (clear expression, the logic of the sentence); the other looking toward social feeling about ways of expressing clear ideas (idiom, taste, usage). A balance could not always be struck. A careful user of *shall* and *will* for instance, feels that in the interchanging of these verbs there is real confusion; but the majority of educated Americans (including teachers of English everywhere) have no such feeling when speaking and only occasionally when writing. Social practice, even that of our best speakers, is accordingly against him who insists that the interchanging of these verbs is an error. At all events nothing can be said in favor of teaching a rule that the teachers do not follow. Nevertheless, for the sake of not seeming to overlook a "common error" we have religiously checked the instances in which, as a matter of taste, we should have used the word not preferred by the speaker.

Likewise, partly as a matter of curiosity, we have checked up the very frequent use of *you* as an impersonal pronoun.

Few manuals of usage pay much heed to this employment of *you*. It is apparently regarded as a rare usage, and examples from Longfellow (*Outre-Mer*) and Emerson (*Essays*) are cherished alongside the aphoristic "You can't make a whistle out of a pig's tail." But in children's exposition, in their expression of opinion, and especially in their talk of matters of taste or expediency (as in *Industrial Arts*, for instance), the impersonal *you* becomes first obtrusively frequent and in the end ludicrously ambiguous. The ambiguity, however, is only theoretic; no one ever misunderstands. And the usage is thoroughly reputable. If it were not open to suspicion on other grounds than those of variety we should not be justified in listing it here.

With so much by way of qualification we present a table of frequency of errors with rough indication of the relative importance of separate items.

TABLE I
ANALYSIS OF ORAL ERRORS OF CHILDREN IN SPEYER SCHOOL
Frequency and Distribution of Errors

Grade.....	I	II	III	IV	V	VI	VII	VIII	Total
Pages examined.....	74	41	38	44	198	169	318	160	1042
<i>Sentence Structure</i>									
Incoherence—									
From misuse of connectives									
<i>Loose and</i>	83	202	84	30	254	265	131	152	1207
per page ..	1.12	4.9	2.2	.68	.77	1.6	.41	.95	
<i>Because chain</i>	0	0	0	0	0	1	0	10	11
per page ..	..	..	..	..	..	..	..	..
<i>Irrelevant so</i> ..	3	1	4	0	1	6	2	5	22
per page ..	.04	.025	.08	.0	.003	.036	.009	.01	
Incoherence from other causes.....	5	10	5	8	15	33	39	50	165
per page.....	.06	.24	.13	.18	.07	.20	.12	.31	
Lack of logical conformity between subject and predicate.....	0	0	0	0	0	1	6	6	13
per page.....	..	..	..	..	..	..	..	..
Total errors.....									1415
<i>Pronouns</i>									
Vague it.....	0	28	2	0	19	52	37	22	150
per page.....	0	.68	.06	.00	.096	.308	.11	.13	
Ambiguous reference....	1	28	2	1	9	6	39	31	117
per page.....	.013	.68	.05	.02	.045	.03	.12	.19	
Antecedent blunder....	0	5	1	0	5	2	9	34	56
per page.....	0	.12	.026	.00	.02	.01	.02	.31	
	0	5	0	0	0	11	0	1	17
Cases.....	0	1	0	0	0	0	3	2	6

Confusion of—									
what, how, why.....	0	0	0	0	1	2	0	0	3
who, which.....	0	0	0	0	0	0	1	0	1
“Impersonal you”.....	46	16	20	13	37	41	136	261	625
Total errors.....									875

Adjectives—adverbs

Grade.....	I	II	III	IV	V	VI	VII	VIII	Total
Nice.....	0	4	0	2	7	0	1	19	27
Good—well.....	0	6	0	0	5	0	3	11	25
That—so.....	2	2	0	0	1	3	1	4	13
Awful.....	1	1	0	1	2	1	0	6	12
Vague, too.....	0	0	0	0	3	0	0	8	11
Fancy.....	0	0	0	0	0	0	0	6	6
Most, almost.....	0	0	0	0	2	2	0	1	5
Comparison.....	0	0	0	1	0	1	1	0	3
Some where, some place ..	0	0	0	1	1	0	1	0	3
Total errors.....									105

Other connectives

Like—as.....	0	4	1	2	4	6	3	3	23
per page.....	.00	.09	.06	.04	.01	.36	.009	.01	12
If—whether.....	0	0	0	1	0	0	2	9	12
Than.....	0	0	0	1	0	2	0	0	3
But.....	0	0	2	0	1	0	0	0	3
If, though.....	0	1	0	0	0	0	0	1	2
Where (in definition)....	0	0	0	0	0	2	0	0	2
Total errors.....									45

*Prepositions
(idioms mainly)*

Grade.....	I	II	III	IV	V	VI	VII	VIII	Total
In—into.....	0	2	2	1	0	1	2	0	8
Superfluous in, on.....	0	0	0	2	0	0	2	1	5
Of—in.....	0	0	0	0	2	0	2	0	4
To—at.....	0	2	0	0	0	0	0	0	2
In—on.....	0	0	0	0	1	0	0	0	1
Without, except.....	0	0	0	0	0	0	1	0	1
Total errors.....									21

Miscellaneous

Lot.....	3	0	0	3	11	22	0	0	39
Kind of a }.....									
Sort of a }.....	3	2	0	1	10	4	5	5	30
Much of a }.....									
Like phrases.....	1	0	0	1	4	55	0	1	11
Kind of { humming }.....									
{ whistling }.....	1	1	0	0	3	1	0	1	6
{ laughing }.....									
Total errors.....									86

Table I should be read as follows. In grade I seventy-four pages were examined. In these pages sentence structure was incoherent because of the presence of the loose and eighty-three times at the rate of 1.12 occurrences a page, etc.

TABLE II
SUMMARIZES TABLE I

<i>Summary—</i>	
Total pages of stenographic reports examined.....	1040
Total errors noticed.....	2841
<i>Distribution—</i>	
1. Sentence structure.....	1415
2. Pronouns (including impersonal <i>you</i>).....	875

3. Verbs.....	294
4. Adjective-adverb.....	105
5. Connectives (other).....	45
6. Prepositions.....	21
7. Miscellaneous.....	86
Total.....	2841

Table II should be read as follows: in a total of 1,040 pages, 2,841 errors were noticed. Of these 1,415 were in sentence structure.

Probably the most significant contribution of this study is the silent commentary which it makes upon the work of schools in their effort to improve the quality of children's speech, though it should also have a certain interest in comparison with the results obtained in other attempts to determine the actual nature of children's speech.

III

Illustrations and Comments

For the sake of concreteness we here illustrate the more fundamental errors. In a few cases it has seemed worth while to make some comment.

1. The *loose and*: Only careful experiment will make certain what the meaning of the error is and how best to correct it. We have suggested above in a sort of preterition that it arises in *the necessities of the mental mechanism whereby the learner tends in every situation to form the easiest bonds first; and so long as these will approximately serve his ends, to shirk the more consummate but vastly more difficult bonds.* (Thorndike: *Educational Psychology*, Vol. II, pp. 261-284.) It may be simpler, though it is somehow less satisfactory, to say that

a. Possibly the pupils' sentence sense is not sharp.

b. Probably ideals of clearness have not had sufficient basis in explicit analysis for principles: i. e., class work often has mainly *factual* aims, and consequently principles (technique of subordination) have been only implicit. The habit of organization, if established in written work, has not sufficiently even for the grades carried over into oral recitations. The fault suggests on the whole a lack of familiarity with the function of various subordinating words.

c. The paragraph idea has possibly not been given much play.

The elimination of the fault might demand

a. Practice designed to sharpen the sentence sense.

b. Class inspection of ineffectual "run on" constructions, with practice in their reconstruction.

c. The formulation of some principles or the tabulation of some resources for the difficulty; for example, the temporary taboo of *and* might be helpful. (Thorndike op. cit.)

d. Avoidance of questions so framed as to encourage enumerative answers.

EXAMPLES OF THE LOOSE AND

First Grade

Typical Oral Composition

"There were three pigs, a mother pig and a father pig and two little pigs and they went out to see their grandmother and their grandmother lived over in the woods across the way and then the little piggy went over to see her and when he came back their mother was out and they didn't know what to do and he said: 'I will go and see if I can look in the window,' and one little piggy said: 'I will look in the dining-room;' so one little piggy, etc., etc.," (seventeen more lines!).

Second Grade

Nature Study

"Sometimes the birds get the seeds on their feet from the mud when they are carrying little straws and the birds drop them on the ground and the wind blows them away and then when the rain hits it it washes the little seed down a little hole and it is planted.

Third Grade

Industrial Arts

"We first had a big sheet of paper and we took off the paper on which we had drawn our bowls and we measured how far we had our border and we put the lines on the paper *like that* and then we put, etc., etc."

Fourth Grade

Geography

"He was used to their kind of ways and was used to the kind of things they did and the way they dressed and he saw here great big buildings and different things and it wasn't like he was at home."

Fifth Grade

Geography

"The granite is found in the New England States. In the New England States they have great mountains of it and they found it is too hard to mine if it is in great masses and the quarries are near cities or water so it can be more easily transferred."

Sixth Grade

History

"I saw them changing their money and I saw a man put a mark on their shoulders if there was something the matter with their eyes and when they were changing their money some of them had only a little bit and some had a whole lot."

Seventh Grade

History

"The children are very respectful in Japan and it is a disgrace to have bad children and the children honor their parents."

Eighth Grade

Various Classes

"I know one day I was going to school and I saw a blind man who wanted to go across the street and there were boys and men there and he said: 'Will anybody please help me?' and I took his arm and helped him across and I think I did perfectly right."

"A little while ago The Globe had a rummage day and you can send a postal and they go to the house and get them."

"The land isn't as large as California and only fifteen percent of the land can produce food and they have to go outside for their food and when they annexed Korea they got more food."

2. *The Irrelevant So, and the Because Chain*: Much of what we said of the preceding fault is also applicable here, though the error seems fundamentally more serious.

EXAMPLES OF THE *Irrelevant So**Eighth Grade*

Geography, Industrial Arts, etc.

"Find out the kind of life they lead and how patriotic they are so they could beat Russia."

"I have another hat I wear for good and when I bought it I was thinking of changing it, so I always get a plain hat."

"If factories made everything out of lead the people wouldn't buy it; so they make more money if they make things of iron and steel, because the people will buy them."

EXAMPLES OF THE *Because Chain*

"You can have a plain tailored hat for Sunday just as you can for week days, because I think black is a good color to wear with a tailored hat because you can wear that with any dress."

"I think the location, because if you don't know the location you won't know about anything else, because when the exports come around if you don't know where Europe is you won't know which way they have to send their ships when they are going to different countries because if you don't know where they are you can't trace anything."

3. *Incoherence not due to misuse of connectives*: It will be sufficiently evident that many elements of a situation may contribute to unsatisfactory expression. Some of these we may indicate briefly in passing.

EXAMPLES

Second Grade

Groping for Expression

Teacher: "How do you know when a story can be dramatized?"

Pupil: "You can play it things you can make believe; and things can be played."

Sixth Grade

Heated Expostulation

"They say about schools, but what are schools for?"

Seventh Grade

Heat, groping, and cool blundering

"When Frances said about some people who don't like what they are doing, I don't think there are many people in New York who like their business."

"If a dress looks good—if a girl wears a dress, say a checked dress, I am sure it (a plaid ribbon) would look as good on her hat as it would on her dress."

"One thing we found out was the reason why Japan beat Russia was because they kept their camps and their cells and their sanitary conditions."

Eighth Grade

Too-common Errors

"If we wanted to attract attention to ourselves at all it would be just the way we acted."

"If they go to high school, if they were a girl they could go to Wadleigh; but they cut out the secret societies; but they have other clubs, and the boy could join a society at his high school."

General

Other Common Errors

"Put it on the side the paint isn't."

"Your question wasn't only money."

"Besides carrying babies on their back there are no beasts of burden in Japan."

4. *Shall-will, should-would*: We have already in passing spoken of the interchanging of these verbs. Little further need be said, unless we should present a bibliography of the other-worldly articles upon this matter that have been consistently disregarded up to the present time by those who determine the customs that we follow. There is a sort of admirable consecration or devotion exemplified in the attitude of those who scrupulously continue to make the fine distinctions (in subordinate clauses and in indirect discourse) that perforce must be lost upon a decadent world. So long as they do it as a matter of habit or with (so to speak) their superfluous energy no one has any business to commiserate them. Do not some play golf, whilst others, having a garden in their back yard think themselves happier? "How many things by season seasoned are!"

It may still, however, not be amiss to point out that the bulk of the "confusion" is in the past tenses. Here we approach a form of expression which we think is open to objection on other than puristic grounds.

EXAMPLES

"If we would say we would take people too old to work we would have to keep them in the poor house."

"I would think they would manufacture."

"I wouldn't like to go to a dance that you don't have to pay."

"I think I would rather study their education first."

"We won't need to know about that."

"I hope we won't make that mistake."

"I will have to do it this way."

5. *The False Conditional (would be=is, etc.)*: Apparently related adventitiously to the should-would mixup is a construction which we think is vicious. We lower our guard here, and with great vim set down the full measure of our aversion to it—resolutely disregarding the weak feeling that since in the main only theoretic confusion results from its wide employment, to object to it is captious. Some of the closest thinkers we know (in philosophy and psychology) are, together with those who constitute the bulk of their readers, not disturbed by it. As the type of the construction we offer the sentence: "Twenty-five per cent of \$1,000 would be \$250," and insist that the would-be habit is worse than it sounds. Fundamentally it is an evasion of responsibility: the responsibility for positive declaration, the obligation to have an opinion upon obvious matters.

Probably there is something in the relations of teacher and pupil that fosters the construction. Occasionally in the higher schools one sees evidence of its being consciously chosen for the specific purpose that it best serves. In the lower schools it often appears to be an indication of the pupil's lack of real interest in the occupation of the moment. In any event it gives (me) the impression of insidious doubt about the reality of subject-matter; of confirmed defensiveness in a game.

Manuals of usage almost ignore it. Hodgson (*Errors in the Use of English*; Appleton) is the only one I have examined who mentions it. He gives a single example. Colloquial English, however, furnishes many illustrations, some patent, others not readily separable from the should-would tangle. It is quite possible that (being under a certain momentum of aversion) I may sometimes, though I think not, have classified doubtful cases in the wrong category. The stenographic reports of Speyer furnish relatively (if our casual impression from observation of other schools is nearly fair) few examples and these (all things considered) not glaring.

In general the fault is easily dealt with, by simply making the pupil conscious of it. The judicious interpolation of a brief question: "If?" "Under what condition?" "Why isn't it?" or the like, will serve.

EXAMPLES

"The language of the Americans would be different" (from that of the Greeks).

"They would not have as good art here" (as they have in Greece).

"The thought (of this sentence) would be: 'After the man has, etc.'"

"Symbolism would be the explanation of what that (a scene in a play) means."

"In here (a book) it shows all the things these immigrants took when they came over. That (the data referred to) would show that some were skilled."

"That (legislation) would be a function of the government."

We may (with some, but not much, unfairness) mass a number of questions illustrating (among other things) what seems to us to be one provocative of the mode of expression that we have just deprecated.

"What would you say that a boy's work is?"

"Why would some of the cheaper pieces of meat be indigestible?"

"What would be the way of deciding what things would go well together?"

"What would be some of the undesirable things in cheap cuts of meat?"

"What would these items refer to?"

"How many (i.e., what percent of a given number?) people will this 18000 be?"

"What would you call a good breed of cattle?"

"Would that information be important?"

"What would be another topic under this?"

"What would be the thought in this line?" (See answer above.)

"What would you say the problem was?" (i.e., What is the problem?).

"What would be your object in asking: 'Are you going back to Greece?'"

"What would be your criticism on this story?"

"Let us hear what you think would be the next point."

"Would you need a topic to include this?"

6. "*Like*" phrases: Here we may let our illustrations speak for themselves. Those who with us mildly disapprove of this peculiarity may be interested to note the considerable variety of the modes of attack that are concentrated in this one form. We here invent *the teacher's question*, not having been thoughtful enough to take down both question and answer.

EXAMPLES

Teacher: "How could this be shown?"

Pupil: "Like in public school—once they had a piece of cloth with a hole in it and they darned it."

Teacher: "What brings the immigrants here?"

Pupil: "Like if they wanted to fly from prison—they would come here."

"Like yesterday—we etc."

"Like in Hawaii—the Japanese etc."

"Like giving presents at Christmas time—you etc."

7. The impersonal *you*: A thoroughly reputable usage may become obnoxious through monotonous repetition. The im-

personal *you* is surely overworked in most schools. It is not *always* the *best approach to predication*. Study of the context raises in many cases a presumption in favor of the view that continual recourse to the impersonal *you*, especially as an opening word, marks a wrong approach to predication, a lack of directness, lack of impersonal seizure of the point at issue, lack of grasp of the means of sentence variety. But here again we have to curb the artist petulance over the chasm between what is and what ought to be. This use of the impersonal *you* is peculiarly the child's way. The technique of expression is mastered slowly. The degree of grasp of it that can properly be sought in a given grade is not surely known. Teachers (far beyond the elementary school) have not put aside the childish method. Their questions are unconsciously so framed as to encourage its use.

By way of illustration we use some bits of dialogue.

Teacher: "Another reason for knowing how to darn stockings."

Pupil: "You don't look nice with holes in your stockings. It shows your character."

Teacher: "Anything else about stockings?"

Pupil: "I don't like white stockings on a big fat person. They make your legs look too big."

Teacher: "What else?"

Pupil: "Your stockings should not be so thin."

Teacher: "Anything further in regard to clothes?"

Pupil: "You should not wear too much jewelry."

"I should think you would change your stockings twice or three times a week."

Teacher: "Anything further in regard to keeping clean?"

Pupil: "I don't think you should put special stress on that (i.e., hands and face) because you see a lot of girls whose face and hands are clean but if you ever looked at the back of their neck, it is black."

Teacher: "What else?"

Pupil: "You should wash your hair often."

"You should keep your hair neat."

"If you have very light hair I don't think you would look good in light colors."

IV

Cruciality Ranking of Errors

In all work in corrective English two standards are involved and overlap. Such errors in sentence structure or choice of words as thwart meaning seem to many to be of much greater importance than violations of good usage. On the whole, however, (such at least is the impression I have gained from supervision) it is fairly certain that much more attention is given to the latter sort, the stock aversions, than to the former which I have elsewhere called the unconventional errors.

For the sake, however roughly and inaccurately, of comparing the values of the two classes of faults, I have in the columns below ranked the main errors dealt with in this report. In column I, I exhibit the impressions I have gained of the emphasis commonly laid in corrective English in the elementary school. In column II, I arrange what seemed to me to be the more serious errors roughly in the order, as I see it, of their importance.

I	II
<i>Usage, taste, diction</i>	<i>Sentence structure, meaning</i>
10. Slang (including <i>awful</i> , etc.).	10. Incoherence (not thru misuse of connectives)
9. Automatism (now, well, etc.).	9. Incoherence (thru misuse of connectives)
8. Case, number, person, etc.	8. False conditionals
7. Ambiguous reference	7. Lack of logical conformity (chiefly in definitions)
6. <i>Like</i> for <i>as</i> , as if, etc.	6. Ambiguous reference
5. <i>In</i> for <i>into</i>	5. Tense attraction
4. <i>Without</i> for <i>except</i>	4. Misuse of prepositions
3. <i>Different than: different from</i>	3. Different than: different from
2. Because, so, but	2. Omission of auxiliary
1. And	1. Participle for verb

Multiplying the number of errors of a given kind by the number representing the position in the column of the error in question we get a rough comparison of relative values. Thus:

- 10. Slang: $60 \times 10 = 600$
- 9. Automatism: negligible
- 6. Like for as, etc.: $23 \times 6 = 138$.
- 10. Incoherence (see above): $165 \times 10 = 1650$
- 9. Incoherence (connectives): $1240 \times 9 = 11160$
- 6. Ambiguous reference: $117 \times 6 = 702$.

By this device we make it appear that incoherence is to slang as 1,650 is to 600 and so on. It is too bad that this does not settle the matter. Who knows what the relation might be in a comparison made by somebody knowing ten times as much about the matter as I do? It is useless to speculate over these data. They add only one bit of concreteness to the general counsel of Educational Sociology (as voiced in the bril-

liant lectures of Henry Suzzallo) : namely, that though schools must always idealize social practice somewhat, they nevertheless must constantly take their cue therefrom. It would evidently be futile in Speyer to teach from (say) the Kansas City list of errors. It is extremely unlikely that (whatever their causes) the divergences of these lists are exceptional. The place to find out what to do in corrective English is— not in the printed lists of composition books and compiled courses of study and inventories like this and other incomplete ones made by other people of unknown biases. In advance of investigation, no one (to be as dogmatic as the teacher I quote) “knows what are the common errors” in his own school. Beyond this, English may follow the cue to relevance by more tolerantly consulting social practice for wholesome standards. What this would mean can essentially be gathered from consideration of, say, Professor Krapp’s scholarly treatise (*Modern English, Its Growth and Present Use*, Scribner’s) and the numerous essays of Professor Lounsbury.

KAIBARA EKKEN (1630-1714)

By YOSOHACHI YOKOGAWA, Clark University

I. HIS LIFE. Kaibara Ekken was born at Fukuoka, Kyushu district, November 14, 1630, two years earlier than John Locke of England. His house was one of hereditary knighthood, himself a retainer to the feudal lord in Fukuoka. His two brothers were well educated, gentle Samurai, or knights, both admirers of literature. Like Locke, he was a quiet boy of weak constitution, while mentally he showed genuine keenness and love of study. From his fourteenth year, after five years of elementary education, Ekken studied classical Chinese with Sonsai, his big brother, who was the tutor to the successor of his feudal lord. With eagerness young Ekken studied many books, and mastered several sacred books of Buddhism. He carefully studied medicine as he was very anxious about his own weak body, just as Locke studied the same science under similar conditions. Ekken compiled an elaborate book of hygiene, "A collection of hygienic principles" (Isei shuyo), and at the advanced age of eighty-four he simplified it for children's use. This is called "Instructions on hygiene," the most popular and most valuable book on hygiene in the pre-Meiji age of Japan.

It was not unreasonable that his attainments in medical science should have been much more advanced than those of his contemporaries. He had wide and comprehensive knowledge and personal experience in several branches of medicine, especially hygiene, therapeutics and pharmacy; while physicians in his age were mostly ignorant men of the hereditary class of their profession. Once Sonsai, his brother and instructor, had a severe fever, and no treatment of his doctor was effective. As Sonsai was growing weaker, Ekken took his physician's place, and by his skillful treatment Sonsai soon began getting strength and recovered entirely in only ten days. One recalls the similar story of John Locke, that when the Earl of Shaftesbury, to whom he was physician, confidential adviser, and tutor, was sick, Locke successfully treated and cured him.

Ekken spent three years (1658-61) in Kyoto, a center of learning in his age, where the home schools of the greatest contemporary scholars, namely Kinoshita Junan, Matsunaga,

Sekigo, Yamasaki Ausai and others, were attracting students from the various parts of the country. He did not enter any schools in Kyoto because his learning was so advanced and he wished only to polish it through personal intercourse with these authorities and by attending their lectures. After three years' devotion to his own culture in Kyoto he returned to his feudal lord and served as tutor for forty-four years, receiving appreciation and respect from all around him.

In his long life, Ekken went up to Kyoto twenty-four times, twelve times to Edo, and traveled in almost all parts of Japan. Again like Locke, Ekken was a social scholar and had many friends among nobles and scholars.

In 1701 A. D., at the age of seventy-one, Ekken resigned from his long service of tutoring to three generations of his feudal lords, and died in 1714, ten years later than John Locke, having enjoyed the last fourteen years of his life in writing books. He left some poems, one of which, written at his last hour, was this:

From my childhood, I kept a sublime aspiration in my bosom;
I regret that I could not realize the early hope in my character and
undertaking.

What was my work in a career of eighty-five years?
Quiet pleasure in study was my own life.

Hatsuko Kaibara, the wife of Ekken, was a highly educated woman for her age, a skillful composer of couplets. Several times she accompanied her husband on his trips and aided him greatly in his books on geography and travels.

II. HIS WRITINGS. A complete list of his writings might be divided into six groups:

1. Selections. 7 editions.
2. Commentaries and translations. 7 editions.
3. Literary collections. 6 editions.
4. Original contributions and compilations. 6 editions.
5. Travels.
6. Popular textbooks on education. 26 editions.

Among these writings The Collection of Hygienic Principles in the first group; Encyclopedia of Botany in the second group; Meditation, and A Treatise on Doubt in the third group; Japanese Botany in the fourth group; and all the books in the fifth and sixth groups, were most powerful educational writings in Pre-Meiji Japan.

III. THE FUNDAMENTAL PRINCIPLES OF STUDY. As the writer understands him, the fundamental principles of study shown by Ekken through his own life and writings may be

condensed under three heads: 1. Education should be a wide cultivation of the human mind and body; 2. All studies ought to have a teleological end; in other words, the ultimate aim of all studies should be the promotion of human welfare; 3. Doubt is the fountain of intellectual development. The first and second principles are the fundamental principles of all grades of education, and the third of higher education.

His time was during the most remarkable age of philosophy and literature in Japan. For instance, Hayashi Doshun (1583-1653) and his hereditary successors were the eminent Chue school scholars and were teaching from the standpoint of empiricism, as the tutors to Shoguns and the presidents and professors in the central government university were. In contrast with the Hayashi family in Edo, the capitol, Nakae Toju, a retired knight, established a home school in a rural district on the western shore of the Lake Biwa, in the vicinity of Kyoto.

Toju and his famous disciple Kumazawa Banzan of Okayama were the most eloquent lecturers of the Wan Yan Min school, of idealism or rationalism. From the disciples of Toju, many reformers and many politicians developed and played an important part in the revolution of 1867. Other great scholars contemporary with him had shown equally high attainment in their own lines, philosophy and literature; but none of them were as broad minded as Ekken and they made no contribution to the study of hygiene, geography, botany, or agriculture. The age of Ekken was by no means a period of broad education, and no school or home taught children after broadly planned curricula. Especially no one dreamed of a curriculum of elementary education or had a definite idea of the educational age of children, except that some rough plans appeared in the Chinese classics; so that Ekken's *Dojiken* (The instructions for children) was the epoch-making book in education of that century.

Ekken's pragmatic emphasis was on daily practical matters such as domestic affairs, hygiene, and agriculture. Contemporary scholars had for the most part exerted a very good moral influence, except a few who devoted too much attention to the arts and literature; none of them pointed out practical and minute suggestions as Ekken had done; Ekken says in his preface to a guide book of agriculture translated from the Chinese by his friend: "The principles of wise state administration are only two, instruction and feeding. In the order of necessity, feeding first, and instruction should come next to it; because sufficient clothing and food foster refinement. Therefore, kings of ancient times felt their responsibility to promote

industry and the material welfare of their people. I believe the first step in the promotion of the people's industry is the reformation of agriculture. So I wished to write a plain book on practical agriculture, but I did not have time enough to carry out that purpose, owing to my slow nature and want of energy."

Ekken claimed personal freedom of study in higher education and strongly emphasized the value of doubt. He says in his *Dai gi roku* (A treatise on doubt), "Doubt is a most valuable motive in study; if a student begins to doubt profoundly, he can make more progress in his work; even a little bit of doubt might be a motive to some progress; but there is no progress without doubt. Hence the human soul always needs doubt and must evolve it for the sake of its own advancement. Probably if a student does his intellectual work diligently and struggles for the realization of his ideal, he would necessarily have to doubt, so that one who has no doubt in his mind is a student who lacks sincere effort." Ekken's "A treatise on doubt" was written in his later life when he began to doubt the empiricism of the Chue school which he kept long after he had shaken off the introspective rationalism of Wan Yan Min that he enjoyed in his early life.

IV. HIS PEDAGOGY. John Locke did not deal with education in general, but only with the education of young gentlemen. Ekken, likewise, practically treated education for the young Samurai and for the young rich men, thinking the education of this class the most important part of the education of people in general. Ekken says: "All people of four castes (Samurai, farmer, workman and merchant) ought to teach their children etiquette and ethics; for these are the foundation of character building; and they should also teach mathematics; and the children of Samurai, besides this, should be taught archery, horse-riding, fencing, spear performance and Jujitsu." He says also: the first duty of parents to their children is to give them moral education from very early childhood. These words are contradicted by the custom of that age, when the people thought culture was necessary for Samurai, but men of lower castes might remain in ignorance, and no clear sense of duty was developed among parents for the next generation.

Accordingly, he is the first man who dealt with education in general, and as early as the 17th century advocated parental duty in education in Japan.

Ekken realized the importance of school education for two main reasons:

1. In the home children will become too familiar with the educator, easy going, and selfish.

2. The school will stimulate the children's spirit of emulation and the spirit of self-control.

Moral Education. According to Ekken, the teaching of etiquette and ethics is the foundation of character building. He was an enthusiastic follower of the Confucian moral principle. "The ancient proverb," he says, "is true. The impressions received early in childhood are like heredity, the habit becoming like nature." Hence a "good habit makes a man good, a bad habit makes a man bad. Habit has a strong power over man." Again in the "Instruction for Children," he says, "The education of a child must begin as early as possible, but against this statement, many ignorant people claim that if the education begins at so early an age, it will repress the child's activity, therefore it is better to leave the child's mind to unfold gradually, and when grown its wisdom will help it to adapt itself. To be sure these are the words of a foolish man and it is a great interference with education. Instruction must begin when a child begins to eat and to speak, before its mind becomes preoccupied with bad influence through sight and hearing."

Thus we can see that the formation of good habit is the central idea of the moral education in the pedagogy of Kaibara Ekken. Consequently he suggested providing good surroundings, saying, "The tutor must be chosen from among virtuous men; the friends must be selected.

Parallel to the above mentioned doctrine of habit formation, Ekken recognized the necessity of training. His argument on this point in his "Instruction for Children," "Meditation," and some other books might be divided into four points:

First. Parents ought to observe the orientation of desire in their children, and repress some bad tendencies, such as sexual indulgence, luxury and cowardice; repression of cowardice is most important for the children of Samurai.

Second. Ekken says a strict drill is very necessary in education. The great majority of parents and attendants of the children spoil them with short-sighted kindness and sympathy. "Flattering children produces unspeakable misfortune in their future."

Third. If you praise the goodness of your children, they will lose their virtue; if you praise their arts, they will lose their skill. The man who praises his son is the most ignorant of three fools.

Fourth. He thought in education the spirit of endurance and patience must be trained and a man is useless unless he has gone through painstaking training. For instance, in "The Instruction for Children" he says: "Children ought to be in service to their parents and guests, they must study several kinds of lessons. Waste of time is harmful for children. Clothing, food, implements, rooms and attendants might better be insufficient for an aristocratic house, because the men trained through painstaking care in their youth, easily endure hardship and can be strong, loyal servants to their lords, and sons of filial piety. For the same men there is no fear of indulgence in luxury; surely they can keep their home safely; and the same men might get rid of poverty or endure it when it was unavoidably by unfortunate accidents or on the battle field. Strict training is the best way of expressing love." Ekken in his educational writings used to say: "Be peaceful in mind but busy with hands." Accordingly he wished to occupy children's time with play, to furnish them a good time. For boys, kite-flying, toy-archery, and all kinds of ball games and tops; for girls, dolls and battledore-shuttlecock were recommended by him, and he disapproved of betting and expensive kinds of play.

Intellectual Education and Curriculum. Ekken wished to give wide and manifold education, putting reading in the center. Through it he taught ethics, politics, economy, history, and geography. In the primary grade he put writing in the center and by it he suggested the teaching of reading, something in history, and in geography. In the grammar grades his plan was to teach letter writing, commerce, and agriculture.

In "The Instruction for Children," and in "Meditation" he says: "Loving simplicity and hating complexity is human nature; therefore in primary education complex material and long sentences ought to be avoided, for these dull the interest of children. Unless it is memorized, knowledge is useless. In giving your lesson, always consider children's power of memory. Morality is the universal culture required of all people; but art relates to individual character.

Roughly, these are Ekken's principles of intellectual education: The four years from 6 to 9 represent the elementary grade; four years from 10 to 14, secondary; and five years, 15 to 20, the higher grade of education; in each of these years five subjects, writing, reading, etiquette, and ethics were taught, and various kinds of art commonly were given from the tenth year. As I have already pointed out, in these subjects writing and reading are the central subjects with which many studies are connected.

Hygiene. His hygienic ideas were the most highly developed of that time, though their value cannot be estimated from the scientific standpoint of the present age. But in his time—the seventeenth century—it must have been a wonderful doctrine in an isolated country of the far east.

Among his teachings were the following:

1. Thick clothing and heavy meals are very common unhygienic errors among aristocrats. For children some measure of cold and hunger is necessary. This is the wise method to protect the stomach and make their spirit strong.

2. Out-door work is very much encouraged during fine weather; for wind and sunshine make the blood pure and the skin healthy.

3. Before six years of age, children are better to go to bed early and get up late. Give them food in response to their appetite; etiquette should not be required of them.

4. Children must not be still; they should be encouraged to play.

5. Be pleasant in heart; worry is unhygienic; be diligent in body; too long rest is unhygienic.

6. Singing and dancing are recommended because these make mind and body supple and promote digestion.

7. A room is better to have light from the south; it should be neither dark nor too bright, because darkness shuts the spirit up, while too bright light wastes one's energy.

8. Harm from moisture is slow but serious. People must be careful about it, etc.

Education of Woman. Two articles were contributed by Kaibara Ekken to the education of woman: one is "How to Teach Woman;" the other, "The Greater Study of Woman." An unknown contemporary writer compiled a book on woman's education called "Imagawa's letter to Woman." In comparing these three, I have noted that, in general, they agree in their main points. Perhaps their doctrines represent the strong public opinion of that time and may be condensed into the following statements:

1. Woman's destiny is decidedly to be a wife and mother; consequently her entire life is for the home and for faithful service to her husband, her parents-in-law and her own children.

2. The most important virtues of woman are chastity and obedience.

3. Except to the members of her family she ought to be segregated from the other sex, so that, unless unavoidable

business forces her to be out, it is always better for her to stay at home.

4. Education in all kinds of refinement is required for woman; but she has no need of higher intellectual education.

5. Halberd and dagger performance and sometimes Jujitsu are encouraged for woman in the Samurai class, in order that she may protect herself and her beloved ones.

His influence on the education of woman was great. Ekken's "Onna dai gaku" (The woman's greater study) was used as the most important and most common textbook in woman's moral education. It was so powerful that whenever girls or women were admonished, some part of *Onna dai gaku* was generally quoted as the text of instruction.

Woman's three ways of obedience to men, namely: when she is young she ought to be obedient to her father; when she is married she ought to be obedient to her husband; and in her old age, to her son; and the seven causes of divorce, were thought by the people during more than two centuries to be laws of inviolable truth. This was so profoundly ingrained in the Japanese mind we can conceive a good deal of the teaching remaining in the subconsciousness of men and women in that country.

The Influence of Ekken on the Education of Japan. Through the whole Tokugawa epoch (1602-1867), the secondary and the higher education of Bushi or the knight, was carefully managed by the central and local government; but the education of the girls and boys of the three castes, farmers, workmen and merchants, was not entirely cared for by the government or public bodies, so that, naturally, this was left to the influence of the home and private schools, and the teaching of them fell into the hands of men of leisure, such as the priest, the inkyo (a retired person from the head of the house) and the ronin (a brave man or retired knight).

Ekken's influence on elementary education was great. His fundamental principles in elementary education were faithfully followed by all teachers of the elementary schools or terakoya (a cottage of a Buddhistic temple) teachers. Accordingly, if we glance at the practice of the terakoya education, a school of men of leisure, we can soon realize how the pedagogy of Ekken influenced it.

We can note the following heads:

1. The choice and arrangement of the teaching material. The forty-eight different syllabics in a poem were given in the first step of the writing lesson with reading; next, the figures, the directions, and the clan and the street names (village names

in the rural terakoya) in the Chinese ideographs; to them a brief history and geography of the children's native place and the country were connected; and then simple commercial, industrial and agricultural correspondence follows. These are the center of all necessary knowledge concerning business, industry, and agriculture.

2. The practical method of teaching. Ekken's careful procedure in teaching and writing was completely adopted by almost all elementary school teachers in tarakoya. Generally writing lessons are given to very young children, using a stick for a pen and a tray of sand or rice-bran.

The children must write, following a copy book written by an excellent master, with the stick in the sand tray. The size of each character at the first steps in writing is very large, being about five or six inches square; therefore the child uses for the most part the fundamental muscles connected with the shoulder, elbow and arm, accompanying the pronunciation or reading of the syllabics that he is writing. His posture must be straight except for a slight bend of the head. At the next stage, children are taught to make ink by the friction of a cake of indian-ink on the ink-stone, one part of which is filled with water; and with a brush he has to write on an old paper copy-book called the soshi. Oftentimes new white paper is given for test and encouragement.

3. The moral training. The cleanliness and good order of the teacher's seat and the children's desks, the sweeping and dusting of the class room, are the children's responsibility. Sometimes they must serve their teacher's private needs and go on errands. Generally, obedience and politeness were regarded as the most important virtues, and corporal punishment was practiced.

Why was his doctrine so powerful in Japan in the past and the present? Of course any one can point out that some part of his thought is unreasonable and impracticable in the present age, yet I think he saw the eternal truth of the necessity of hygiene in education, and of the spirit of manliness for the prevention of decadence; and he recognized the light of the sacred torch of genetic psychology at a time as early as the seventeenth century.

PEDAGOGY AND THE DECALOG

By HERBERT PATTERSON, Dakota Wesleyan University

Throughout the history of Christianity, perhaps no part of the Bible has been more emphasized in the early religious education of children than the ten commandments. Generation after generation, children have been taught to repeat these words. Many sects require that their adherents, when presenting infants for christening or baptism, solemnly promise that they will teach their children certain portions of the Bible, and almost invariably these chosen selections include the ten commandments. Many Sunday schools urge all children to learn them. Often they are found inscribed upon the walls of church auditoriums.

In spite of the fact, however, that the ten commandments have been regarded as of such great importance in the religious education of the child, too little attention has been paid to the problem of discovering the best methods to use in teaching them. Habit rather than reason, tradition rather than science, thus far have dictated the method most employed. Good people have tacitly assumed that all children should be taught "by heart" all the commandments, and that the younger they are taught the better. Is this practice based upon sound educational principles?

The greater the truth to be taught, the greater the care in the way it should be taught. If this be granted as true—it seems, indeed, plausible—then the conclusion must follow that the manner of teaching the ten commandments is important enough to demand serious consideration. Has not the time arrived when thoughtful people desire that their children should receive a better religious education than they themselves received, even as they wish them to receive better secular education? It is to such, to those who are ready to examine fairly new proposals for improving religious instruction, to those who are unwilling to regard as axiomatic the view that already a perfect pedagogy of religion has been discovered, that the following discussion is directed.

At what age is it best to begin teaching the commandments? Should all the commandments be taught at the same time? Which should be taught first? Which should be postponed until the child is older? Should the Bible rendering be learned

"by heart," or should some of the words, and ideas, too, perhaps, be simplified? Such questions arise and suggest the beginnings of a pedagogy of the decalog.

There are three educational principles, quite generally accepted by modern educators as sound, which are violated when the young child learns "by heart" the ten commandments. There may be others, but these three suffice for illustration here. Without defence of these principles, I shall assume their validity, and view in the light of them the early memorization method of teaching the decalog.

Words should be taught in connection with the experiences and ideas which they represent. In our better secular schools, no longer does the little child commit to memory "mere words." Such experiences and ideas as are vital in the world of the child are made the center of school activities. Children's stories, children's poems, children's songs, children's games—in fact, the whole children's world—furnish the material which is to be made the basis of the reading, writing, spelling, and number work. It is deemed unwise to teach words whose meanings are incapable of being understood by the child.

If this be a true principle in early education, what bearing does it have upon the teaching of the commandments? Little children should not repeat over and over again such meaningless expressions—meaningless, at least to them—as "commit adultery," and "covet thy neighbor's ass." Either the words are without any meaning whatsoever, or else they have for the young child wrong meanings. The moral and religious value of having children learn such expressions is highly questionable. And yet quite generally the small boy of six or seven is taught to repeat the words: "Thou shalt not commit adultery," while the little girl of like age repeats: "Thou shalt not covet thy neighbor's wife."

The education for young children should emphasize interest rather than effort. This is a second principle quite generally accepted as sound educational doctrine. In our better elementary schools, the early approach to learning is made pleasant rather than painful. If the doctrine of effort ever transcends that of interest, it is in the later years rather than at the beginnings of education. "Let early education be a sort of amusement" is as sound doctrine to-day as it was when Plato gave it expression many years ago.

Do children enjoy committing to memory the ten commandments, or is it done as a task, a task in itself unpleasant but undertaken in order to please the anxious parent or friend? Much of this unpleasantness might be prevented. It is because

of the rather large amount of uninteresting material—uninteresting to the child—which is intermingled with what, if separate, would prove more interesting, that the child views the entire project as tedious. Were the ideas couched in less archaic language and only those commandments taught which had a direct bearing upon the life of the child, he would be interested. Is there not a real danger that the unpleasant memory tasks of childhood will bear fruit in the adult's aversion to the Bible?

The natural development of instincts should furnish the order of presenting material. Whether or not this principle be followed to the extent advocated by the believers in the recapitulation theory—that ontogenesis recapitulates phylogenesis, that the child passes through the same stages of development that the race has passed through—there is no question but that certain instincts do have quite a definite time of maturing, notably, for example, the sex instinct.

There comes a time when the injunction "Thou shalt not commit adultery" has a very real meaning, but this time can not be placed much before the age of puberty. To teach such a commandment prior to this time is to do more harm than good. "Honor thy father and thy mother" is, however, a bit of advice that very young children can well understand and profit by. According to G. Stanley Hall, obedience is the one cardinal virtue of childhood.

The underlying difficulty seems to be that the commandments originally were intended for adults rather than for little children. If they are to function in the actual conduct of children, they must be adapted to the understanding of children. This implies that the language should be simplified, modernized, and many of the ideas, too, should receive like treatment.

It surely is important that children should learn to love God, to honor their parents, to work faithfully, to keep Sunday holy, never to swear, murder, steal, lie, or be selfish. The weighty question is this: Do they really learn these virtues, actually becoming more religious and moral, through their committing to memory at a very young age the Bible version of the ten commandments? Would not better results be obtained if sound educational principles were followed in the religious and moral instruction of children as well as in their other training?

Believing that morality and religion can be taught through ideas as well as through action, and believing that the substance of the Bible is more sacred than the form, its ideas more valuable than its words, I am forced to conclude that a

presentation to the young child of its principal thoughts in such language as will be simple, clear, and fitted to the age and interests of childhood will be productive of better religious and moral results in the life of the child than the traditional method can ever secure. The task, then, is to simplify the commandments, keeping in mind the young child rather than the mature adult.

Who is to undertake this task of simplifying the commandments? In order to secure the desirable "authority" for any other wording than that of the Bible, it would be necessary for a body of scholars, composed of both theologians and educators, to study the problems involved and carefully construct a children's version of the decalog. The various sects would need to adopt such a version as authoritative, urging its use for all children. Gradually, then, would it come into general use, just as the Revised Version of the Bible is superseding the older King James' Version.

Since, however, no such body of scholars is working upon the problem, it becomes necessary for individuals to undertake the task. Is it not imperative that the individual create for his own children a children's version of the decalog, if he believes that such a version is desirable and there is no religious group ready to furnish him with one? It is with the hope that discussion upon this subject may be aroused that the attempt is here made to formulate such a version. The wording pretends to be suggestive only, and it is offered in the spirit of reverence and sincerity.

COMMANDMENTS FOR CHILDREN

God is my God; He is a Spirit; I must love Him, worship Him, and serve Him. I must never swear. Sunday is God's day; I must do all my work on other days, but on Sunday I must rest and worship God. I must honor my father and mother. I must never kill, nor steal, nor lie. I must not be selfish, but be kind to all.

Think of the young child, and ask yourself honestly this question: Will such a set of commandments fit his needs better than the longer, more involved and archaic sentences which usually are taught him? If it be granted that a children's version of the ten commandments is desirable, there is at once suggested the question as to whether or not there should be a children's version of other portions of scripture, and the problem of relating pedagogy and the decalog appears as but a phase of the much larger and more perplexing problem of relating pedagogy and the Bible.

PURPOSE IN TEACHING FOREIGN LANGUAGE

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Perhaps the most important question that can be asked concerning anything has to do with its purpose. Particularly is this true in the field of education, since all hands therein are engaged in the process of prosecuting certain tasks, the one value of which must lie in the ends attained. It would seem therefore, above all, that every single step in education should be preceded by its own definite, crystallized aim.

But it is a singularly unfortunate fact that, very often, education is without definite aims of any kind—or at least of the right kind. Perhaps nothing in the world is hazier or more relegated to the background than some of the “aims” of education. It often seems to me as if education is just drifting along in a formal, mechanical way, largely unconscious of specific aim elements at all.

For this reason, school has come to be too exclusively a mere “keeping,” a mere doing of things in a certain way because custom has established the precedent. The very inertia of education seems oftentimes to leave even the most fundamental errors of our education unchallenged, and because of this fact the most stupid practices frequently abound in our schools.

But it is not my desire to deal with the purpose of education in a general way. My specific task is to deal with purpose in its application to the teaching of foreign language. What has been said thus far is simply by way of introduction.

It is my conviction that foreign language is one of the most aimless subjects in any curriculum—that is, one of the farthest from what its true aim should be. In my opinion, the results obtained in foreign language study (particularly Greek and Latin) in comparison with what those results might be, attest to one of the gravest educational blunders ever enacted. This does not mean at all that I am opposed to the teaching of foreign language in our schools, but simply that I can give no exclusive or even fundamental quarters to prevailing “aims” in this field.

As partial evidence of the fact that something must be very

wrong somewhere, I submit the fact that Greek is gone. Its very "friends" are primarily the ones who have killed it. And Latin—is going. It has been going slowly for the past century, but with alarming and increasing rapidity the past twenty-five years. On all sides the complaints have steadily grown, till to-day, to say the least, the subject is in decided disfavor. Probably there is no more popular or more famous saying around our high schools to-day than the following: "I just *hate* Latin!"

And for it all I blame not Latin, and in general not the teachers of Latin, but chiefly "the powers that be," with all their body of inadequate traditions. Nor are the out-and-out enemies of Latin to blame in any way for its going. Neither are the pupils to blame, for their reactions represent perhaps nothing more or less than a reasonably normal psychology. Rather is the going out of Latin typically the case of Greek over again—the innocent victim of an incomplete purpose—killed by its "friends."

Had the friends of Greek and Latin accepted universal complaints as a symptom that something must be wrong, and then proceeded to examine into the case, instead merely of enthusiastically and clamorously insisting that Greek and Latin are worth while, there would be an entirely different story to tell to-day. But Greek and Latin enthusiasts preferred to do as they did—follow a road even to destruction simply because it was well paved with traditions. Let us see what those traditions are. They seem to constitute the prevailing aims in foreign language study.

Taking Latin, the first "aim" has always impressed me as being far more in the nature of an objective requirement than a logical language aim. It is as follows: The first year, beginning Latin; the second year, Caesar; the third, Cicero; the fourth year, Virgil. Here we have the reason why Latin is being taught: a response to a requirement. And what is the aim?

Outwardly, the aim is to "finish" those books. In reality, however, the aim is perhaps a "reading" aim—the ability primarily to translate Latin into English. Such an aim looks somewhat like "art for art's sake." But whether it is or not I am of the conviction that the "reading" or "requirement" aim is very inadequate as a fundamental aim in the teaching of Latin. I say this, not because I think that the reading of Latin has no value in it, but because I regard such reading value as secondary—a means to an end. The reading of Latin certainly cannot be permitted to become an end in itself. Therefore I am compelled to take issue with what is perhaps

the fundamental aim in Latin teaching to-day—"reading"—because it is neither basic nor complete.

But when we challenge the friends of Latin on this score they tell us that while pupils are completing the reading requirements of Latin, they are at the same time gaining information. In answer to this, it is of course correct, that pupils do assimilate a certain amount of information in the process of reading Latin. But I reply that for the typical pupil it is perhaps not worth while to learn to read Latin merely for the sake of getting information—for, as a matter of fact, such a route to information is entirely too circuitous. If the same information can be gotten in English form, why should anyone deliberately take on the pace of a tortoise by resorting to Latin? In my conviction, one should not. I believe, therefore, that the "information" argument is hardly a sufficient justification for the teaching of Latin.

But the friends of Latin will perhaps next contend that the mastering of forms, declensions and conjugations necessary for the reading of Latin texts, trains the memory. I answer that it does not. And even if it did, it is by long odds too costly a process to indulge in. Let us dismiss the memory argument.

Driven from the protection afforded by memory training as an aim in the teaching of Latin, the enthusiastic champions of this subject next advance the argument of formal discipline. They say that Latin broadens the mind and makes one a good thinker. Now, I do not believe that there is a living person who knows the truth concerning the exact merits of formal discipline. It therefore behooves us not to become too dogmatic. Nevertheless, I believe that we can all safely agree that if any subject is to remain in our curriculum to-day it must be on some basis that is far more substantial than the doctrine of formal discipline. Let us therefore dismiss this argument also.

But there is at least one more line of trenches to which the friends of Latin repair. I hear someone say: "Latin helps one in grammar." Well, I would be ashamed to admit it, because it isn't so. Latin helps no one in grammar, chiefly for the reason that English grammar is so simple that it needs no help. It has been my observation that as a rule the person who says that "Latin helped me in grammar" knows but very little grammar of any kind, English, Latin, or otherwise. If this is not the case, then that person merely lounged through grammar in the elementary schools. But in either event the grammar advocate of Latin is for the most part indulging in a mere fiction for the lack of something better to say. At

the same time, I would emphasize that my views on the grammar aim of Latin study apply, not to the philologist or language specialist, but exclusively to the great rank and file of Latin pupils. I freely admit that Latin has an English grammar value for the specialist. But that it has any such value for pupils generally I deny.

Well, I take it, that this about completes the gamut of aims dominating the study of Latin today:

1. The reading or requirement aim
2. Information getting
3. Memory training
4. Formal discipline
5. Help in English Grammar.

With reference to the last three of these aims I would say that in my opinion the sooner every real friend of Latin drops them, the better it will be for the future of all foreign language.

Against the first two aims, however, I raise only the objection that they are not fundamental aims. I would by no means eliminate either of these two aims. I do say, however, that as aims they are very incomplete. I would even say further, that if there be no purpose for the study of Latin other than the ones mentioned, then Latin is perhaps entitled to much of the cordial hatred that has been heaped upon it. Like Greek, it is perhaps earning its passports to get out of our schools.

But how about it? Is there no further purpose to be found for the study of Latin and Greek? I answer: Most emphatically, there is! Both of these languages have been operating in the past, not at all under a set of wholly worthless aims, but under a set of very incomplete aims. The trouble has been, that the fundamental aim has been overlooked. Were the aim in question operating in the teaching of these two languages I want to say boldly that in my own opinion Greek and Latin would occupy far more conspicuous places in our high school than they do today.

But what should be the fundamental aim in the teaching of foreign language, and especially in the teaching of Latin and Greek?

I answer: Etymology—word-study, first, last and always—the study of primitive root meanings—inquiry into literal forms—the analysis of language in the process of evolution—the history of language in all that pertains to word-building. In fine, the romance of words—that should be our basic aim in the study of foreign language.

And in all the assigned tasks of the classroom there could

be none more valuable, none more charming than such a study. Back of every word in the English language lies a story that is teeming with an interest that could well challenge in competition all the fairy playgrounds of the human mind. To appreciate this, we must remember that language is the oldest of all arts, and the most universal. The English language, be it remembered, is not a creation of yesterday. It has been cradled through all the centuries of civilization, and through countless centuries that have been lost. To me each word in the English language today is but an adult whose baby-pictures are to be found reposing in the cradles of antiquity, pictures chiefly from the days of Greece and Rome. Greek itself is but the baby-pictures of so many words in our own language—baby pictures from the days of Athens and Sparta; and Latin is but the same—another set of baby-pictures—how another large share of the words of our language looked when they were clad in the swaddling clothes of Roman civilization.

He who studies foreign language from this standpoint, with etymology as the great cornerstone of all procedure, is, therefore, but taking so many peeks into the baby's cradle at different times during the centuries—simply drawing aside the curtains of antiquity and lifting up the coverlets to look at the baby. Here in the English language, for example, a certain word today may be designated as the old man of 80—but go back to the Greek thirty centuries or more ago and it may perhaps be seen how the baby looked at the age of six months. Beyond that we may not be able to go very far, as the great gallery of Indo-European origins is largely beyond us.

But aside from the intense charm of foreign language as based upon the word-study aim, let it be clearly understood that the word is both the logical and the psychological unit of language evolution. It is not sentences that constitute the scaffolding of language growth in passing from race to race, but words. The reason for this is, that words are basic in thought origin, primitive and elemental in experience. Every child in learning to talk gives proof of the fact, the use of sentences coming only after words have developed to a certain extent.

Now every word in its origin in antiquity was always a visualization of some reality. The tap-roots of words are always logical, literal things. For this reason language is at once the most logical of all creations—and oftentimes the most artificial also—logical in the sense of literal first origins; artificial in the sense that the origins may be unknown or lost sight of as a result of centuries of mutations in the process of word-building. But language is all the more logical, pictur-

esque and charming owing to the fact that its word-origins are concrete at all times. Word-origins are but the reflections of reality.

Now, the reality which originally underlay every word that survives today, still survives. The word that we use today is but a leyden jar that received a certain charge of literal reality possibly twenty or even forty centuries ago, with certain modified charges added or subtracted here and there as word mutations have flowed and ebbed. But the original charge, the original reality of each word remains.

Well, it is that original picture that we want to get just as fully as possible in the study of foreign language. We want the basic meaning of the word, its innate message, the actual literal story that it tells. We want to experience the fundamental thrill and vision of the race in the process of word invention. What the race has experienced objectively in its word-building we want to experience visually, imaginatively, picturesquely in consciousness. We want to see down deep into the concrete significance of each word, as we would look through a sieve. Then a word has that meaning which comes to us only through that understanding which emerges as a result of satisfying personal experience.

It must be remembered that every word in our language is endowed with a definite personality, somewhat after the manner of a human being; also that learning the personality of the former is exactly like learning the personality of the latter—one must see either in a number of different reactions. But the most fundamental, the most illuminating reactions of words are to be found in their primitive root origins, in their concrete literal backgrounds—like human beings again, in their native haunts. To the native haunts of a word must one go if he is to know the real richness of its personality—and, furthermore, the search must be one consciously directed toward personality finding.

But this is not all. If the personality of words is not traced to their origins—that is if etymology is not made the guiding star of foreign language study—then word personalities are not discovered at all in any significant sense: They are but vaguely understood on the plane of definition. Now, definition, be it remembered, is not only the last stage of science, but it is also the last stage of understanding. But definition which displaces basic sense experience is but the essence of superficiality, leaving understanding, as it does, without substance in those prerequisites that go to make up understanding.

And yet I point out that mere definition is far too exclusively the resort today in getting at the meanings of the words

in our vocabularies. By mere definition I mean any word treatment which does not go back to the root meanings themselves. The word Mesopotamia, for example, is utterly meaningless and artificial to those who have been kept in definitional darkness. As far as all such persons are concerned, the word Mesopotamia might just as well be any senseless jumble of letters.

But how different is the story to the person who has not been robbed of his word heritage! He sees the literal concrete pictures that this word holds. He sees that "Mesopotamia" means something, that the word was rocked in a Greek cradle, that it is made up of the Greek preposition Mesos (between), and Potamos (river), so that the word actually means "Between the rivers." With such an understanding how much more vivid it is, and how much easier it is to remember that Mesopotamia is that stretch of territory lying between the Tigris and the Euphrates. Armed with such a view memory takes care of itself, while the individual himself *knows* the word. He has neither to "look it up," nor accept it on a colorless, meaningless faith.

Purely, therefore, from the standpoint of economy in learning, to say nothing of acuteness in understanding, etymology is to be heralded to the very forefront. Showing the very fabric of which language is composed, the student of etymology becomes a master in analyzing the words that pass before him. He is not the dictionary slave that he otherwise would be, nor is he the "rule-of-thumb" user of words that others are. To the student of etymology, new words are not new, for he knows something of the elements entering into our language. Such a student has the power of individual attack and initiative in approaching any word for the first time. Further than this, such a student is less superficial in all his language study, for he is more critical in his understanding of the exact meanings of words.

And above all, etymology is psychologically sound. It affords mental charm. The human race has always been fascinated by word lore. It is a genuine combination of the play element in work. It is rich in interest, and self-satisfying in its rewards. It leads the student parallel to the great and deepened bed of the stream of language evolution—the stream which has been directed at all times by the word as the unit of all progression. And we may know, that if the student is to be sound in his progress he must be surrounded with that consciousness which will make him keep step with language in the manner in which its great course of evolution has flowed so majestically and so incessantly onward—toward a horizon

of words, leaving its deposits always in words, reflecting itself always in words, and always with its words inundating the plains of advance civilizations.

Yes, that is the truth of language—words! That is the charm of language—words! Etymology as the key of purpose is the one key which will unlock for us the treasures of Greek and Latin—etymology, that word which unlocks itself with its own key, coming as it does from the Greek *Etymon* (the true literal meaning of primitive root words) and *Logos* (word, discourse, treatment)—etymology: The science of word origins in their true literal concrete significance. Etymology simply is the study which draws aside the curtains of the past and reveals to us the galleries of language draped in all their infinite richness. That is what etymology is and does.

But it will be claimed of course that under current procedure in the teaching of foreign language, some etymology is already being learned. The contention is correct, to be sure—but how much etymology is being learned? Precious little! Whatever etymology is being picked up is merely as an incidental by-product. No word study consciousness is left with the pupil at all. The concept of language evolution is left untouched. Word origins with all their literal concrete richness, remain untapped. The movement of the human mind as reflected in word history is totally lost. In fact, the entire charm and essence and power of etymology hardly enters into consciousness at all.

And let it not be forgotten that the part played by consciousness in the study of etymology is exactly as great as in any other field. The human mind grasps things in proportion to the degree that things get into consciousness and remain there. Regardless of the part played in life by the subconscious and the merely incidental, the fact remains that education must drive home to the very pin point of focal consciousness every single thing that it would impart or develop. Education must be drastically conscious in all things that are its business, with the clear understanding that pupils are not going to absorb in any miraculous manner anything that is merely left lying around or covered up by the wayside. Every single issue must be vitalized and vivified by the glow of a central purpose which the mind of no pupil can fail to see and understand.

I therefore regard on general principles as exceedingly trivial any etymology that pupils are to pick up incidentally in the study of any foreign language. Not only this, but on the basis of experimentation with such pupils I have uniformly found that they are strangers in the field of etymology. To speak to the typical foreign language pupil about etymology is to

throw that pupil into a haze of bewilderment—and indeed it is no wonder when we stop to think that foreign language courses are so largely engulfments of conjugations, and declensions of strange incoherent words, all fed into a verbal memory that is stupefied for the lack of a motive, for the lack of a living, associative interest. Surely such a combination sinks into hopelessness all prospects of getting etymology by the incidental route.

The approach to etymology, I repeat, must be conscious and directed. Along with the concept of language origin and language evolution, there must stand out clearly the concept of *form similarity* between words of different languages. At the beginning, those words should be dealt with which clearly show the passage from one language to another. As fully as possible, identical forms should be made use of to begin with. For example, it is not at all enough to send pupils away with *farmer* as the final associative word for the Latin *agricola*. It must be specifically developed that *agriculture* and *agriculturist* are the corresponding English forms. Similarly in the Latin, it is next to folly to say that *dare* means *to give*, or even that *do* means *I give*. Etymology demands the locating of *form correspondences*, wherever they are to be found. Consequently, *dare* and *do* must lead to the English *donate* and all its various forms. To fail to make such a development is simply to crush out all consciousness of the concept of language evolution, aside from the fact of placing memory on the lowest possible plane—the verbal plane. Between *do* and *donation* there is a logical association, but between *do* and *give*, or *dare* and *give*, there is no association whatever, save whatever hard-fisted artificial attempts one might make in the endeavor to remember that both words mean the same.

And in the concept of form similarity in words, it is remarkable to what extent correspondence is to be found. In the words *labor*, *omen* and *animal*, for example, the correspondence between the Latin and the English forms is exact. These three words constitute an example in which the baby pictures (the Latin forms) bear an exact resemblance to the adult pictures (the English forms). But ranging from word forms that bear exact or close resemblance, there extends a field which by degrees finds its farther limits in word forms from which apparently almost every vestige of resemblance has faded away. An *extreme* example of which is by no means the common English word *gist* which traces itself back to the Latin *iacere* (to throw), by way of the French *gesir* (to lie) as used in the following French proverb: "C'est la que *git* le lievre" (it is here that the hare lies)—that is, here lies the

point, the *difficulty*, the *sum* and *substance* of our endeavors—here lies *what we want*—such is the background of our English *gist*. The French resemblance to the word of course remains, though the Latin parentage is inconspicuous, to say the least.

But regardless of how obscure form resemblances may sometimes be, or how intricate and circuitous the life experience of any English word may be, the pathway of its etymology is none the less charming. Wherever etymology has led its trails, no matter how remote or how seemingly careless into the most hidden or the most unexpected recesses of strange fields of thought, there in those very places there is sure to exist a mental charm and a mental value which every human mind should explore in the combined spirit of the workshop and the playground. In life, very often the most intricate path is the most inspiring in the scenery and the surprises that it affords, to say nothing of the final prospect to which it may ultimately lead—and etymology is far from being an exception to this principle, regardless of the entanglements that may be here and there involved. The point is, that etymology is all thoroughly worth while—all, from those forms in which the “baby” has undergone no changes whatever, clear on to those extremes in which the hard road of experience has so changed the baby that its early pictures could never at all be identified by those representing its adult life.

So I repeat then that every consideration, social and psychological, demands etymology as the cornerstone of foreign language study. Such an aim is basic. As a prerequisite, it is absolute. Nothing can take its place.

And how is such a study to be made?

First, as already indicated, by announcing etymology as the fundamental justification for the study of Latin and Greek, and by making this same purpose one of the prominent aims in the study of all modern foreign languages.

Second, by giving to Greek and Latin conspicuous places in foreign language departments—more important places than French and German owing to the superiority of the former over the latter as source material in etymology.

Third, by making at least two years of language study a requirement for every pupil in high school, the major portion of which time would be devoted to Latin and Greek.

Fourth, by demanding a new set of text books—an entirely new presentation of the whole subject of foreign language—a presentation based fundamentally on the concept of language origin and language evolution. The new approach must be diametrically opposite to the present current approach—it must

be a genetic approach: This means that our traditional texts in foreign language must get out and stay out—especially is this true of current texts in Greek and Latin.

Fifth and last, by reforming foreign language teaching in colleges and universities in order that all students and all prospective teachers thereof may be given the etymological viewpoint. This would make a course in the history of language a prerequisite for all students. I would also be tempted to make one half year of Greek a requirement for every student receiving a college degree of any kind. However that be, every prospective teacher of any foreign language, regardless of what one, would be required to take at least one half year each of Greek and Latin. It is my firm conviction that no person is prepared to teach French or German or Spanish as they should be taught, unless that person knows a minimum amount of Latin and Greek.

And in this connection I desire to take decided issue with any persons who would decry either one of the two last named languages. I take this stand, not by any means as a matter of digression from the subject of this thesis, but as a regular part of it, for I can conceive of no foreign language that is worth while without etymology, and of no etymology that is worthy of a second's attention without Greek and Latin. It is for this reason that I insist on these two languages. At the same time I am aware that on the basis of past performances, the opponents of Greek and Latin are legion—and on such a basis I am blaming no one. But I am arguing for the future.

In so doing I cannot help feeling how pathetic the proposed experiment of The General Education Board of New York City is from the standpoint of foreign language. They are going to eliminate Greek and Latin entirely! Evidently their experts are totally unconscious of the great field of etymology, and of the very dominant part that these two languages play therein. It is likely that this Board is setting Greek and Latin aside on the basis of the judgment of the world up to the present time. On such a basis the decision is at least partly warranted. But by no means is The General Education Board to be congratulated on its apparent inability to see that the Greek and Latin testimony thus far given to the world is incomplete and unfair. I myself am compelled at times to agree with the world and with the Board on traditional Greek and Latin—but I say to both the world and to the Board that if we want *evidence* on Greek and Latin we must go to etymology. What tradition has said on these languages is only *testimony*.

For example, current testimony has long had it that Greek and Latin are “dead!” What are the characteristics, I want

to know, of the quality of "deadness" on the part of any foreign language? Is it possibly the fact that a certain language is no longer spoken or read or written in our own day? If so, then Latin and Greek are dead—deader than old Marley—"deader than a door nail!"

But I must deny and denounce any such an exclusive basis for pronouncing Latin or Greek or any other foreign language "dead." In my opinion, no criterion is fair or complete that does not involve vocabulary considerations—the extent to which a so-called "dead" language lives in the words of a language which is admitted not to be "dead." On such a basis, Latin and Greek are most vitally alive, for the English language is shot through and through with word origins that go back to both of these languages. Possibly four-fifths of the English language is to be traced either directly or indirectly to Greek and Latin cradles. And yet people will talk about these languages as being "dead!" No language is dead that lives in another language—unless of course the legacy of that language is repudiated or obscured by failure to relate the living language to it. Such failure with reference to Greek and Latin has of course obtained in the past, but that is no fault of the languages themselves. All blame must attach to the manner in which these languages have been manipulated.

But there is a way out of the Greek and Latin jungles of the past, and that way is etymology. Until such a path is taken, these languages may really be said to be "dead." But once etymology becomes the motive, both Greek and Latin will be found to be teeming with life meaning for us, for the process of such word study will vitalize the English language. This fact can readily be shown by analyzing almost any of our well-known English words in terms of Greek or Latin. For the purpose of illustration I have selected the twelve following words, whose component parts are made up of Greek roots. A very brief analysis of them is given:

- Hippopotamus = *ippos* (horse) plus *potamos* (river) = River horse.
ἵππος ποταμός
- Rhinoceros = *rhinos* (nose) plus *keras* (horny) = Horny nose.
ῥινόσ κεράς
- Biology = *bios* (life) plus *logos* (word) = Study of life.
βίος λόγος
- Philadelphia = *phileu* (love) plus *adelphos* (Brother) = Brotherly love.
φιλέυ αδελφός
- Philanthropist = *philos* (friendly) plus *anthropos* (man) = Friendly man.
φίλος ανθρωπός
- Economy = *oikia* (house) plus *nemein* (manage) = Manage a house.
οικιά νεμειν

tional world has simply been misled by the past records of Greek and Latin, never once dreaming that the past of these languages might possibly be unfair to them—never once thinking of the real possibilities that might inhere in these languages if they were operating under their legitimate functions—under a more complete purpose. Had the educational court of inquiry seriously examined into the *why* underlying Greek and Latin it would have been seen at once that in the past these languages had never been given a fair fighting chance of any kind.

But instead of doing this, the educational world has made the mistake of taking it for granted that Greek and Latin having been in the curriculum for centuries, have finally exhausted their right to further parole, when as a matter of fact the very terms of the original probation were at all times enough to circumscribe and handicap Greek and Latin in advance. In a most significant sense, these languages have been as a child buffeted about in an adult world—a world that has not understood. To say the least, the past treatment of these languages has simply been unfair to them. That injustice is certainly enough within itself, without using it as the basis for the condemnation of Greek and Latin in the future. Let that injustice be forgiven.

But there is only one way in which to forgive it, and that is by the exercise of justice in the future. But again there is only one way to be just with Greek and Latin in the future, and that is, to assign to them their proper function, their proper purpose. That function and that purpose has been stated over and over again in this thesis, namely: Etymology. This purpose must be made the fundamental one in the study of these two so-called dead languages. Any other purpose will bring forth but a repetition of the past history of these languages—dreary desert wastes of cactus, sage brush and alkali. For the good of education, and in justice to these two languages, as well as to all foreign languages, let us hope that a new day is about to dawn with the advent of etymology as the center of the solar system of foreign language purpose.

And now before closing I believe that I would be doing an injustice to this entire subject if I failed to take note of "The Dorchester Experiment in Vocational Latin," a report on which was made in the November, 1916, issue of *The Classical Journal*, by Mr. Albert S. Perkins of the Dorchester High School, Boston. It seems that the basis of the Dorchester experiment is the using of Latin as an instrument in English vocabulary building. This purpose appears to be carried out by the duplex process of tracing English derivatives from

Latin roots, and by recognizing Latin roots in English derivatives.

Such an application of Latin represents a long step in the right direction. There is not a doubt in my mind that the plan of the Dorchester experiment represents the best Latin teaching in the country today. It is one of the first steps toward helping to locate Latin somewhere within range of its own natural reserves—within sight of the pedestal of its real purpose: Etymology. Mr. Perkins, of course, does not touch upon etymology as such—upon language history, upon the general significance of word origins, or upon the general concept of language evolution, or again upon language origin for the purpose of lending to the human mind that intensive insight which comes with the basic, the picturesque and the genetic as revealed in word foundations. Nevertheless, Mr. Perkins has made a commendable contribution, and that, too, in spite of the fact that his primary purpose in the teaching of Latin seems to be an extension of the English vocabulary. The general etymological purpose which I am presenting is on the contrary primarily concerned, not with vocabulary extensiveness—not necessarily with *more* words, but with deeper insight into the basic, literal, concrete pictures that underlie every word in its origin.

But while I agree with Mr. Perkins for the most part to the extent that he has gone, I desire to raise a couple of minor exceptions.

In the first place I am rather afraid that in his experiment he is placing somewhat too much emphasis on "the time-honored practice of translation." I will agree with him that the pupil must acquire a certain acquaintance with Latin conjugations and Latin declensions, and I will also agree that participative familiarity therewith will be favored by a certain limited amount of simple translation material, but beyond that I would not go. I most strenuously object to the "reading" of Latin as a fundamental aim for the reason that in my opinion it is this very "reading" nightmare which has all but killed Latin. I feel that possibly Mr. Perkins is demanding too much of "the time-honored practice of translation." As Mr. Perkins himself truly says, "the classics in the public high school today are battling for their very life," so why should we continue in practice unabated that very principle which has been largely the cause of the entire losing battle. Personally, I would very much prefer to reduce Latin translation to a minimum, and to place greater emphasis on direct Latin conversation—and to use both reading and conversation as instruments of etymology.

And then in the second place I might take exception to Mr. Perkins' use of the term "Vocational" Latin. I dislike the designation "Vocational" on the ground that to permit its use leaves the inference that there are other permissible methods of teaching Latin, when there are none. All others are incomplete. Mr. Perkins has simply touched upon a much larger thesis than he has ever dreamed of. To the extent that Mr. Perkins is correct, his method is the only method by which to teach Latin to anybody, I don't care whether that person is majoring in the commercial department, in the science department, in the classical department, or in any other department. All Latin teaching must come to the point of being functional, or else it must get completely out of our schools. There can be no such thing as a "Vocational" Latin on the one hand, and a *Non-vocational* Latin on the other hand. Through and through, the entire question is one of purpose. That purpose must find its answer in function. And that function shall never find its complete realization until the genetic light of etymology is accepted as the lantern by which we are to be guided. It is of course wholly in order for Mr. Perkins to talk about "Vocational" Latin, as a means of calling the attention of a Latin-sick world to the fact that Latin can be made vocational, but sooner or later the designation "Vocational" must go, as we cannot afford to leave the impression that there is some other brand of Latin that is worthy of educational sanction. What we want to do is to place Latin squarely and firmly upon the pedestal of its true innate purpose, and when this is done we shall have simply "Latin," without qualifications of any kind whatsoever.

But, after all, the two exceptions above taken in connection with "The Dorchester Experiment" are but minor, as I indicated in the beginning. Time and further experiment will make whatever modifications that seem advisable. Mr. W. L. Anderson, who is head of the commercial department of the Dorchester High School, and who was the originator of the experiment in question, is along with Mr. Perkins to be congratulated on the manner in which they have stepped aside from the old and beaten path of traditional Latin teaching.

In conclusion, let me say once more that the fundamental purpose of Greek and Latin is etymology. This does not mean that etymology is the *exclusive* purpose. But it is the fundamental one. The same purpose must ever be kept in mind as a prominent aim in the teaching of any of the modern foreign languages. For the past ten years, as a school superintendent, I have been using the plan set forth in this article, in giving talks to the various foreign language classes in the schools

with which I have been connected. Indeed, I have used the same plan, as an instrument of basic analysis in talking to pupils in all classes, regardless of the subject that might be under consideration.

And to the credit of etymology I will say that I have yet to meet the first pupil who is not charmed by the romance of word lore. Nothing in all education, it seems to me, affords such a vast treasure house of original source materials as is to be found in the great sub-cellars of the English language—in the language foundations of antiquity. As a matter of fact, of all methods of approach, by long odds the most comprehensive insight into the genesis of civilization itself is to be secured through inquiry into the rich messages that lie buried in the word origins of language. And aside from the practical value of such insight, the field of etymology is a fertile stimulus to imagination, keeping the mind flexible and colorful by the perspective which is at all times involved. Within etymology there is an element of inspiration which appeals to the emotional side of life, for after all, the study of etymology is but the taking of so many journeys back through the ruins and remains of the ancient and medieval worlds—living over again civilizations that have passed away—actually feeling and thinking in terms of those great races which cradled the language which we are speaking today.

It is my one hope that the day is about to dawn when education in this respect shall at last claim that which is duly and truly its own: Etymology as the one greatest legacy of language.

THE PSYCHOLOGY OF TEACHING

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The well-known saying, that Mark Hopkins on one end of a log and a student on the other would constitute a university, must have something of truth in it, judging from its wide circulation and general acceptance. Now so many people have been lecturing and writing lately regarding the psychology of learning, that we know pretty well what the student may be doing, asking questions, solving problems, organizing and fixing his ideas, but what might Mark Hopkins on his end of the log have been doing? What were his mental processes, and attitudes that he was such an invaluable guide to the immature mind seeking its heritage from the accumulated wisdom of man and the hidden records which the world had made of its own development? What might have been going on in the mind of Socrates as he went about the streets of Athens teaching its youth without library or laboratory? What were the psychological processes of Jesus Christ, whose greatness as a teacher is often overlooked, because overshadowed by the greatness of his teaching?

In attempting to justify the rather remarkable and rash undertaking of analyzing the psychology of teaching, the writer harks back to two fragmentary articles on the psychology of learning published about ten years ago, and the promise that they should be followed in time by one on the present topic. At that time, little had been done in pedagogical works to differentiate the two processes of teaching and learning, being as inextricably confused in theory as they are intermingled in actual practice. Psychology had made a beginning on the problems of learning, especially the technique of memorizing, and today it is the favorite theme. Nevertheless the writer finds nothing expressly on the subject of the psychology of teaching, as a process going on in the mind of an individual who is supposed to be indispensable to another individual learning.

Before attempting a psychological analysis of teaching let us describe and define teachers and teaching in every day language. In the first place the teacher has three rather distinct functions to perform. Most important perhaps is that of the intellectual midwife, as Socrates expressed it; the task

of helping ideas into life, or as we say, guiding the development of the mind of the child along the line of his profound interests through his own activity. The second function is that of the drill master who must see to it that ideas acquired are properly and firmly fixed so that they shall become mental habits. The third function is that of the master student who initiates his pupils into methods of studying which will be least fatiguing and most productive. Roughly speaking, we may say the three terms, instructor, coach, and tutor stand for these three types of teaching, though most teachers must be all three if successful. With due caution, we believe it may be asserted that the proper performance of the first function renders the other two more agreeable and effective.

Teaching, one may call an art, however we may base it upon psychology or educational psychology. Like the artist who has an ideal of beauty which he seeks to embody in color or marble, the teacher has an ideal of truth which he wishes to embody in words, in a lesson, that is in a form which is perfectly adapted to minds as yet but little acquainted with this particular idea.

There have been only a few great teachers, as there have been only a few great men in any field of endeavor. Their chief characteristic would seem to be an almost acute or radical realisation of truth, as existent, if not yet attained. Thus Socrates while proclaiming himself but a seeker after truth, affirmed most emphatically his belief in the existence of truth; it was his great lesson and no doubt profoundly influenced Plato's doctrine of ideas. How often are the statements of Jesus Christ prefaced by that stern "verily, verily, I say unto you," and the comment is significant which describes him as "teaching as one having authority." He who is devoted to a truth presents it with the same force of appeal as an artist presenting his ideal of beauty. Of course it is the intensity of one's devotion which impels one to some sort of expression, whatever one's particular ideal calls for, art, music, teaching, poetry.

Putting it on this basis, it is with ideas of objective truth rather than with the mind of the pupil that the teacher works, and the learner plays the same rôle as does the beholder of an artistic production. Of course in the one, interest, curiosity, is aroused through the reception of new ideas, in the other esthetic appreciation through the contemplation of beauty. The criterion of a work of art is the effect it has upon those who gaze upon it, and the criterion of a lesson is the reaction of the pupils to it. But as was said above, there are few really great teachers. Most of us are mere copyists, exe-

cutting over again what has been offered to us, now and then perhaps doing a bit from nature. One educator, Dr. C. A. McMurry, has realized this very clearly and advocates the making of lesson units by thoroughly trained men who have the gift for that sort of thing. These the average teacher would present as class lessons, using his skill to adapt them as perfectly as possible to the variety of minds.

But, some one says, is that not limiting the teacher too much, will he not be a slave to the teaching ideas of another? Not necessarily, for the best lessons would be planned to lead the teacher to a better control of his knowledge of the subject which would also mean an enlargement. Nor does the repetition of the same lesson year after year mean stagnation for the teacher if he follows the advice of that most ancient and revered teacher, the Chinese sage Confucius, who says: "If a man keeps cherishing his old knowledge, so as to be continually acquiring new, he may be a teacher of others."

The special difficulty in analyzing the teaching process is to be found in the complexity of consciousness while teaching is going on. The born teacher has his ideas so clearly, so definitely fixed with such a wide network of association, and also such a keen insight into the minds of those with whom he comes in contact, that he finds in a flash as it were, the right way to set forth his idea to whomsoever he may wish to instruct. The average teacher, however, knowing approximately what is the extent of his pupil's knowledge prepares his lesson carefully, deciding on the subject matter to be presented and on the method to be used. What then is in the focus of consciousness when one is actually teaching? It seems as if there must be an alternation between the matter presented and the reception of it by the pupils. The one idea is suspended, as it were, with all its peculiar associations, while the other swings into focus. The two are not then rivals for the field of consciousness, disturbing each other by infringing upon each other, but friendly groups which plan to make way for each other. This is peculiarly the case in the presentation-development method, or rather it is more easily perceived in this method of teaching. Both in drilling and showing the pupil how to study, the mind would seem to be more nearly devoted to the one thing, namely, the psychical manifestations of the pupils.

In learning the art of teaching, these two phases may be studied apart, thus simplifying this difficult matter. For example, when studying any subject one should make an extra effort not only to know it by bits or as a mass of material, but should organize the knowledge in some presentable form. Too

many teachers may be described in the words of Confucius, who says in the Analects: "The little children of my school are ambitious and too hasty. They are accomplished and complete so far, but they do not know how to restrict and shape themselves."

Likewise when conversing with others, one should not only listen to what is said, but one should endeavor to observe the grouping of ideas which leads up to the thought expressed, the degree of attention and concentration which certain ideas possess for certain people, and their methods of reaching conclusions. In short, to study the workings of the mind of others as we have occasion, is like the artist filling his sketchbook with the faces of people whom he may meet.

Inasmuch as teaching is the complement of learning it will render the meaning of the former clearer if we briefly define learning from the commonly accepted viewpoints. Learning from a philosophical standpoint may be said to be the bringing of one's experience into as complete correspondence with the truth as one can. Biologically, learning is the adjustment to environment in a way to further the life processes both psychical and physical. Learning, from the standpoint of psychology, is the filling of gaps, which arise in one's consciousness, or rather in a train of ideas in consciousness. Teaching is discovering to the pupil where his thoughts fail to correspond to truth, it is causing the gaps to appear, it is aiding the pupil to complete his experience, to fill the gaps, to make the adjustments.

The first step in the analysis of teaching will be to consider the stream of consciousness as attitude, form, content, and structure. What the attitude is depends on whether the teacher is presenting material or is watching the pupil striving to assimilate the new ideas. In the case of the first, the teacher has a "fixed" attitude of mind towards what he is presenting, that is, he presents ideas in regard to whose correctness and completeness he is satisfied so far as this lesson is concerned. The radical conviction of truth of course implies this fixedness of attitude, but in a lesser degree, every one has this attitude if one is effective in one's presentation of ideas. It would hardly be worth while to convey knowledge of whose validity one was uncertain, unless indeed one is working out a problem in which the pupils are sufficiently advanced to join.

If on the other hand, the teacher is attending to the pupils' handling of the new material, he has an attitude of inquiry. He is reasonably sure that each pupil is able to understand, but has he understood, has he made the right associations, has he arranged the ideas logically, or has the new material become definite enough for organization at all? If the ideas have been

appropriated are they likely to be permanently retained, how much drill, if any, is needed? If it is necessary for the pupil to pursue the subject outside of class, does he know how to go about it? These are the sort of questions which spring up in the teacher's mind while watching the development of the learner. How often the attitude changes depends on circumstances but at all events not so often that the teacher has not clear control of the situation. A fixed attitude as to just what the pupil must know is natural when rules, tables, symbols are to be learned, but the how and when it is learned remains problematical for the best of teachers in the case of each individual.

As to the form which consciousness assumes in the teaching process, it must be rather evident that it is very clear and definite, for the vague cannot well be communicated excepting in emotions which is beside the point. Every thing which the teacher presents will have been at some time clearly in the focus of consciousness and hence will tend to take that form when again in consciousness. Teaching is making that which is objective to be subjective in the mind of the learner with the impetus to become objective through the activity of the learner, for the healthy human mind naturally vibrates between these two processes, *i.e.*, rendering the subjective objective, and the objective subjective, making vague ideas clear and allowing clear ideas to become vague for the sake of permeating the whole consciousness with a delightful sense of novelty and freshness. Of course when the teacher is watching the process of learning, his ideas must become more or less vague since he is constantly attending to that which is for him problematical.

The content of the mind determines in no little degree the success of the teacher. If the pupil is immature, the teacher thinks out his subject in concrete terms and imagery, repeating the fundamental ideas in different words if necessary, seizing upon the questions or suggestions of pupils which indicate their thought content. If an object is being examined, say, a flower or plant, the teacher, however much he have learned about it in an advanced course in botany, fills his mind with the ideas he would like his pupils to have. Thinking along in this way with the learner he is most likely to perceive where the knowledge of the latter is deficient. As James in his psychology points out, the ignorant and the learned both experience their thought as a continuum, while the latter sees the gaps and omissions in the ideas of the former. "It is only as a mirror of things that the superior mind finds them full of omissions." The teacher in the rôle of the superior person perceives the omissions in the minds of his pupils, and pre-

sents his ideas in such a way that the one taught discovers his own lack. In the normal mind a question arises and the process of learning begins.

Such procedure must be very monotonous for the teacher one thinks, but the real teacher is constantly studying his pupils and enriching his mind with this intimate contact with other minds. A student once complained that she felt as if she were under a psychological microscope, so skillful was the instructor in getting at all her thoughts on a topic. Froebel illustrates in a wonderful way what this contact with the mind of the pupil may lead to, for all his life long he carefully watched his children and from this study evolved what was most worth while in his system. He is reported to have said when a tutor of several boys, that when in doubt as to what they should do, he watched what the younger ones did of themselves and allowed the older ones to do the same.

In dealing with a topic which requires a regular train of ideas, there is always a more or less definite arrangement which permits a recall in approximately the original form in which the ideas first were developed in consciousness. It is this arrangement which we call structure. For one's own convenience in recalling past states of consciousness, a great deal of abbreviation is practiced, but when teaching another, one's mind falls into the same arrangement somewhat that it originally made; with this difference that the ideas are more definite and well ordered. So one's mind is not necessarily in a strictly deductive or inductive reasoning structure when one is giving instruction, since one discriminates carefully between what one knows and what one has a right to expect the pupil to learn. We might say that all the trains of thought in teaching partake of the structure of discrimination, for the teacher is discriminating and comparing what he finds the pupil knows with what is the generally accepted truth in regard to the subject. He tests the pupil's knowledge, measuring it by his own, and in this way shows the pupil what he lacks.

The teaching process is a complex one since the aim is not the pursuit of truth for the gratification of one's own desire to know, but the presentation of truth in order to arouse in others the desire to know. The teacher is impelled to his pursuit, not by the individual tendency to complete his own experience, but by the social urge, the racial push, to share his experiences with others. It is this characteristic which renders the teacher so indispensable to the youth of the race. And so Mark Hopkins on his end of the log, guided by his social impulse, is shaping his thoughts to the need of the immature mind before him, making them clear, beautifully simple, fresh, logical.

BINET TESTS ON SOUTH AFRICAN NATIVES— ZULUS

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The results here reported were gathered by us with the aim of providing a basis for discussion, and as work preliminary to the formation of a set of tests for use with the South African natives. We have elaborated a preliminary set of Binet-Simon tests for use with Zulus: they require extensive normation, and we have no data to show their applicability to other South African native nations. We have tried to adapt the accepted Binet-Simon tests to Zulus, for the same uses as these tests are put to among white persons.

Our work is influenced by some attempts to apply the ordinary Binet tests to Zulus. This was done at the Mariannah Mission Station, Natal, in 1914. This work consisted in translating tests only, and served to show the unsuitability of some tests.

The work here reported was done during 1916 at the Amanzimtoti Institute, Adams Mission Station, Natal. A student body of one hundred boys and thirty-five girls, all natives, and the eighty boys and girls of the Adams Practising School, a part of the Institute's Normal Department, furnished our material. Our material included all ages up to 27 years: from it we selected as carefully as possible typical subjects. To our typical Zulu subjects we added one half-caste Basuto girl, as showing the results on the senior student of the Institute who stood first in class work.

This work should be continued on various types of Zulus. Amanzimtoti students have more contact with Europeans than most natives, and their language-facility is markedly superior to that of many Zulus. The most pressing need is to carry on the tests among natives to whom education has *not* penetrated. This should show interesting results.

In the work of testing, as well as in general, Mr. A. E. LeRoy, principal of the Institute, rendered us extensive aid. Mr. N. J. Mfeka, native assistant to the supervisor of American Mission Native day schools, and Mr. G. M. Sivetye, of the staff of the Institute, did the translation. M. T. Mposula,

senior student at the Institute, acted as interpreter. To all of these we owe thanks for their co-operation.

I. TESTS AND METHODS USED

Our starting-point was the revised series of Binet-Simon tests issued in 1911 by Henry H. Goddard, and published by the Training School, Vineland, N. J.

We have translated the directions into Zulu throughout. With the older students, the knowledge of English which they possessed was often sufficient to allow the use of English directions and questions. One of the older girls, A. N., preferred English directions, saying that as all her school work for several years had been in English, she could understand difficult things better in that language.

We have adopted a method of marking suggested by the work of Yerkes, Bridges and Hardwick.¹ We have not taken the point-scale tests of these writers because the scale and tests are not yet definitely established: but we are in decided sympathy with these workers' methods and viewpoint. We have given four points for perfect scores and from 0 to 3 for whole and partial failures.

The standard Binet-Simon weights and drawings were used. We did not, however, use the regular pictures for III, 4, and the other tests wherein these pictures are used. Plate I gives the pictures used by us. The regular pictures imply a cultural status which even the most educated Zulus have not attained: they therefore offer undue difficulty due to the unfamiliarity of the objects and scenes pictured. We may here explain that Hindus are common in South Africa, having been imported for laborers, and hence pictures of them offer no difficulties in the way of recognition.

As our schedules show, we have in some cases used spot, analogy and cancellation tests. On these we make no comment, as the number of subjects used in these was very small.

II. NOTES ON THE TESTS

A. *General*

We have in the main simply translated the Binet-Simon tests into Zulu.

As mentioned above in the case of III, 4, we have in some cases had to devise alternate tests because the Binet-Simon tests dealt with things not familiar to the natives. A typical case, for example, is XV, 2. Few Zulus have a clock or watch,

¹Yerkes, Bridges and Hardwick, "A Point Scale for Measuring Mental Ability." Baltimore, 1915.

and even in school these are not used much. The teacher, as a rule, is the only one who looks at the clock. Hardly any Zulu homes except a few in towns have clocks in them. This same cause made it necessary to omit all the tests for nine years mental age.

All tests involving numbers are subject to change in time allowance, for the Zulu numerals are all long words: E. g., seven is "isikombisa," two "isibili," eight "isishiyangalom-bili."

Age 3 B. *Specific*

1. Translated only.
2. Zulu sentences of six syllables used.
3. Translated only.
4. See Plate I for pictures. Translated only.
5. Zulu children do not always know the family name as such, especially among the uncivilized Zulus, but they all know the father's last name, which was therefore asked.

Age 4

1. Translated only.
2. Objects are kept hidden under papers or behind a box. Key, knife, and penny, as used by Binet and Simon, are not familiar to all, but the objects chosen, beads, native pot and loin-cloth, are. Picture of loin-cloth may be used with equal success.
3. Translated only.
4. Translated only.

Age 5

1. Translated only.
2. Translated only. Use of ink makes it prohibitively hard.
3. Zulu sentence of ten syllables used.
4. Translated only. For object we use four pennies—the large British penny in use in this country.
5. Translated only.

Age 6

1. Translated only.
2. Translated only. "Uname" means a human mother only: hence its use rather than two other Zulu words of similar but wider meaning.
3. Translated only. Spoon is used in place of key because its name is more familiar. Keys are not common among the Zulus.
4. Translated only. There are two words for *left* in Zulu, equally common and familiar to the children.
5. For this test we had prepared, by Mr. J. G. van Gelder, pairs of Zulu faces: but we found that the sets of faces used by Binet and Simon were satisfactory. Translated only.

Age 7

1. Translated only. See V, 4.
2. See Plate I for pictures. Translated only.
3. Translated only. As with VI, 5, we had pictures specially prepared, but found that they had no advantage.

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4. Translated only.
5. Time allowance must be increased to 10 seconds, to allow for the normally slow reaction time of Zulus. Green and blue cannot both be used, as there is only one word in Zulu for both these colors. Red, black, blue and white are used.

Age 8

1. The objects for memory discrimination which Binet and Simon use are not such as to be observed by Zulu children. Many do not know glass at this age. Our objects, spoon and stick, ox and fowl, mealies and amadumbi, are well within their range of experience. Amadumbi is a variety of *Arum edule* much grown by the natives; mealies are our common Indian corn, *Zea mais*.
2. Time allowance must be increased to 35 seconds, for reason given under VII, 5.
3. Zulus as a rule do not know or use days of the week. Even the Christians know only Sunday, for the most part. The children herd the cattle, and are familiar with the parts of them, which they are asked.
4. Among the Zulus children up to ten or eleven years old do not handle any coins except the penny, and only the penny postage stamp. We were not able to devise a substitute. The test is therefore omitted.
5. Translated only.

Age 9

1. See VIII, 4. Omitted for the same reason.
2. The same definitions as in VI, 2, were given. This test is therefore impracticable, and is omitted.
3. See VIII, 3. Here we were unable to find a substitute. Except when in school, the month and year are not known, especially outside of towns. Test is omitted.
4. As with 3. Test is omitted.
5. Very difficult; this procedure is apparently entirely alien to the Zulu children. Test is therefore omitted.

Age 10

1. See VIII, 4. Test is omitted for the same reason. Zulu children of this age rarely know more coins than the penny, tickie (threepence), sixpence, and shilling, and often not these.
2. Translated only.
3. Translated only.
4. The questions of Binet and Simon deal with matters for the most part outside the child's experience. Hence a substitution. Moral judgments are especially hard for Zulu children of this age.
5. Translated only; three familiar Zulu words used. There is no exact equivalent of "make a sentence" in Zulu; hence two sentences connected closely in sense must be accepted as a correct answer.

Age 11

1. We have used three sentences only, finding them sufficient. In one sentence, where Binet and Simon speak of the police, we have given an alternative form, using *chief* instead. This is due to the fact that for most of the Zulus the police are chiefly

tax-collectors, and are not gone to when something happens. The question in its original form shows marked signs of being the product of a country where the police have great power in the ordinary affairs of life.

2. See X, 5. Translated only.
3. Time allows 35 words; slow reaction time. See the individual schedules. Association groups vary greatly.
4. Omitted. Rhyming is not found at all in the Zulu language, and its use in English verse has to be taught laboriously in upper classes.
5. Translated only. One sentence only used. Rather difficult. We did not find any advantage in trying several sentences.

Age 12

1. Translated only. Time allowance for long words is here necessary. Children in school can do it as easily with English numbers.
2. We have found it advisable to change the words for definition, since many of the children do not know the three words used by Binet and Simon. We used: love, brightness and anger.
3. Zulu sentence of 26 syllables used.
4. Translated only.
5. The problems used by Binet and Simon proved very unfamiliar, even with the alteration of "forest of Fontainebleau" to "bush" in the first. The answer to the first was always much delayed and was always "a snake." The second was puzzling, since the Zulus do not, except when compelled to in towns, call a doctor in case of death; and the lawyer and clergyman in this connection or in severe illness are unknown to them.

Age 15

1. See Plate I for pictures. Translated only.
2. Owing to unfamiliarity of the natives with clocks, this test was in every case impossibly difficult. We adopted a substitute, asking how a man's footprints look when he walks backwards, and taking the deep imprint of the heel when walking backwards as our criterion of success. The new test is decidedly difficult.
3. This test is very difficult. Success in it should count for twice as much as success in our other tests.
4. Translated only. We have omitted the opposite for "glad" since "glad" and "happy" are the same word in Zulu. In the case of words, such as "like," we have chosen only one meaning for translation.

Adult

1. Translated only.
2. This test was uniformly a failure, and is therefore omitted.
3. Owing to the words being often nearly all unknown, this test must be omitted. Substitutes are not practicable, so far as was evident to us. The difficulty lies in securing pairs of words that will not be too easy, and still will be known to the subjects. If we were dealing with educated natives only, this might be less difficult.
4. This difference is unknown to the natives. We were not able to find a similar difference that was known. Omitted.
5. This test is very difficult, and with the sentences that Binet gives, was always a failure. Omitted.

III. SCHEDULES OF INDIVIDUALS TESTED.

1. V. Mf. Male, age 6.2. Infant Class A, Adams Practicing School. Parents, Zulu (father a teacher). Tested by Rich, Mposula translating. 2 June, 1916.

Test No...	1	2	3	4	5
Age 3	4	4	4	4	4
4	4	4	2	4	
5	4	0	4+	4+	0
6	0	2	4	4	4
7	2	0	0	0	3
8	0		0		

Additional test, age 5: counting to 5. Score, 4+. Intelligence age: 5.5.

- Remarks: III, 4. Enumerates only. When shown picture of man plowing with oxen, named *use*.
 IV, 4. Binet's test objects used. Possible here because child comes from civilized home.
 V, 4. Counted in English, quickly and evenly.
 VI, 1. Knows hours of day, but not this.
 VI, 2. Defines in terms of use. Took 3 minutes to say "mother—a girl" (in Zulu).
 VII, 1. Counts to 11, then "6. 5." In English.
 VII, 3. Says all pictures lack hands, but one lacks feet.

2. L. Z. Male, age 10.5. Standard 1, Adams Practicing School. Parents, Zulu. Tested by Loades, Mposula translating. 2 June, 1916.

Test No...	1	2	3	4	5
Age 10		3	3	4	4

Test of 10 analogies. Score, 4. 21 words recalled in 3 min.

3. Wm. Ms. Male, age 13. Standard 1, Adams Practicing School. Parents, Zulu (heathen). Tested by Loades, Le Roy aiding, Mposula translating. 1 June, 1916.

Test No...	1	2	3	4	5
Age 6	4	4	4+	4	4
7	4		4	4	4
8	4	0	4		0
9					4
10		2	0	4	2
11	4	0	0		4
12	0	4	4	4	4
15	0	4	0	4+	

Intelligence age, 13.

- Remarks: Began school late.
 VIII, 2. Got as far as 14.
 VIII, 5. Repeated four of the figures correctly.
 XI, 3. 30 words.
 IX, 4. Binet's test given unaltered.
 Adult, 1. Score, 0.
 XII, 4. Resists suggestion.

4. A. N. Female, age 19. Amanzimtoti Institute, II yr. Normal class. Parents, Zulu. Tested by Rich. 9 November, 1916.

Test No...	1	2	3	4	5
Age 12	4	4	4	4	4
15	4	3	2	3	
Adult	4	0	3	0	1

Intelligence age, 18+.

Remarks: All tests given in English at subject's request. Subject understands English as well as Zulu, and is unusually quick in reaction time.

XV, 2. Rather hard. Tried Binet's XV, 2; did not know clock sufficiently for the test.

XV, 3. Very difficult, requiring much additional explanation.

XV, 4. All words of Binet schedule used, in English.

Adult tests. 2, 3, 4, Binet tests used. Did not know all the words in 3 and did not know what a president was in 4.

5. E. G. Female, age 21. Amanzimtoti Institute, II yr. Normal class. Parents, Basuto and Basuto half-caste. Tested by Loades. 2 June, 1916.

Test No...	1	2	3	4	5
Age 12		4			
15	4	2	2	4	
Adult	4		4	2	

Gave 66 words in 3 min. 11 association groups.

Attention tests: 5-group, score, 0.

4-group, score, 4.

Remarks: Adult tests as for No. 4.

6. Z. Mk. Male, age 22. Amanzimtoti Institute, II yr. Normal class. Parents, Zulu. Tested by Rich, 11 November, 1916.

Test No...	1	2	3	4	5
Age 11	4	4		4	2
12	0	3	4	1	4
15	3	0	3.5	4	
Adult	0	0	2	0	0

Remarks: Reaction decidedly slow.

All tests given in English.

Has shown in class work a tendency toward reliance on verbal memory.

XII, 2. For European words, score 2.

XII, 5. Correct answer to Binet's second question also.

To Binet's first question answered "snake."

XV, 2. Very difficult. Watch test here, score 2.

XI, 3. 62 words in 3 min. 5 association groups. Gave English and Zulu words mingled.

Adult, 2, 3, 4, as in No. 4.

The following two schedules are for work done with the unaltered Binet tests, subject only to translation into Zulu. In these the Zulu interpretation was done by Mr. Le Roy.

7. K. Nx. Male, age 14.8. Amanzimtoti Institute, Standard VI. Parents, Zulu. Tested by Loades and Le Roy. 31 May, 1916.

Test No...	1	2	3	4	5
Age 11	3		1		
12	0	4	0	4	4
15	1			0	

Remarks: XI, 3. 29 words in 3 min.

XII, 5. First question, answered "snake." Second question answered "sick person."

8. L. G. Male, age 14.9. Amanzimtoti Institute, Standard VI. Parents, Zulu. Tested by Loades and Le Roy. 31 May, 1916.

Test No...	1	2	3	4	5
Age 12	4	2	2	0	4
15	2		0	4	
Adult	0				

Remarks: Defines in terms of the question.

XII, 5. Answers first question, "baboon." No idea of policeman as man to whom to report things. Second question, answers "sick person." Could not understand why policeman came.

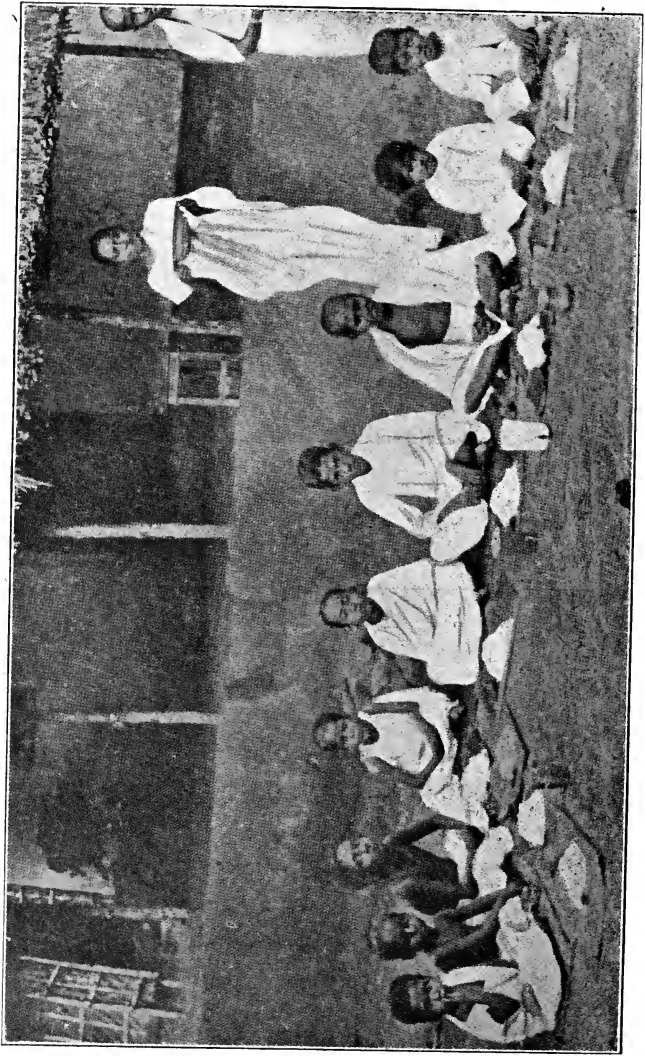
XV, 1. Enumerates only.

IV. GENERAL REMARKS

As noted in the introductory remarks, the greatest need in the way of extending this work is to carry on tests where education has not reached the natives. A comparison of results thus obtained with those from work such as here reported would show the influence of education upon the rate and type of intellectual development. Similar results should be accessible within a few years for educated natives, by virtue of the many changes which native education in Natal is at this time undergoing. Hitherto native education has been mainly a copy of that generally used in England forty years ago: but a modern scheme, adapted to the natives, is now in process of elaboration by the provincial authorities, and should be in effect shortly.

More extensive tests would show to what extent it is true that without education the mind of the native ceases to develop after puberty, and to what extent education prevents this. This point is one on which much difference of opinion exists in South Africa. Our tests would indicate that post-pubertal





development of the mind is different in natives from what it is in Europeans. To what extent this is a result of the particular educational system in use here we cannot as yet decide.

It will be noticed that many of our changes have had to be made solely because the Binet-Simon tests are based on cultural conditions not present among natives, or on educational practices not here prevalent. The cases of the problems of making change, of the watch problem, and of rhyming, illustrate this point.

The facile verbal memory of certain subjects, and the absence of any system of association groups in all our subjects, are outstanding points. This much we can say these tests contribute to comparative psychology. We would disclaim any quantitative value in comparative psychology for these tests, however. It appears from our tests that the disposition to rely on verbal memory, without much attention to meanings, and the absence of systems of association groups, are characteristic features of the native mind.

THE INTERPRETATION OF SCHOOL GRADES

By WADE E. MILLER, A. M., Fostoria, Ohio

This work was undertaken to determine the extent to which the earlier grades received by a student would indicate the kind of work he would do during the remainder of his high school course. It is evident that if the earlier grades are a good index of his later accomplishment, a method which would make it possible to interpret the earlier grades would be of great value not only to the teacher but also to the superintendent of schools in the administration of the system as a whole.

The first specific problem may be stated thus—how many grades must be given a student until the addition of further grades does not materially change the average of all the grades that he will receive by the time he has completed the high school. To determine this, all the grades given to 49 students in the Fostoria high school were used. Throughout the four years' work there were 32 grades given for each of the 49 students. (There are no grades for the last semester of the fourth year, since these 49 students were seniors at the time, and hence those grades were not yet assigned.) These grades were arranged in the order in which they were awarded. They were on the decimal basis, and ranged from 55 to 99. The subjects in which they were awarded were English, Rhetoric, American Literature, English Literature, Latin, Caesar, Cicero, Vergil, German, Algebra, Plane and Solid Geometry, Arithmetic, or Chemistry, Physics, Botany, Physical Geography, Ancient History, English History, American History, Civics, Manual Arts, and Mechanical Drawing. All the data are not given here, but a Specimen Data Sheet is included, on which is given the complete data for student No. 1, merely to illustrate the method employed.

PUPIL No. 1.		SPECIMEN DATA SHEET										
Subject	A	B	C	D	E	F	G	H	I	J	K	L
English.....	89	1	1	8.9	89	89.0	0.0	-8.9	-.111	-8.9	8.9	.111
Algebra.....	80	1	1	0.1	169	84.5	4.5	-4.4	-.054	-13.3	6.6	.082
Phys. Geog....	83	1	1	2.9	252	84.0	0.5	-3.9	-.043	-17.2	5.7	.071
Latin.....	80	1	1	0.1	332	83.0	1.0	-2.9	-.035	-20.1	5.0	.062
Manual Arts...	77	1	1	3.1	409	81.8	1.2	-1.7	-.021	-21.8	4.3	.053
English.....	85	1	2	4.9	494	82.3	0.5	-2.2	-.026	-24.0	4.0	.049
Algebra.....	87	1	2	6.9	581	83.0	0.7	-2.9	-.035	-26.9	3.8	.047
Botany.....	81	1	2	0.9	662	82.7	0.3	-2.6	-.032	-29.5	3.6	.045
Latin.....	81	1	2	0.9	743	82.6	0.1	-2.5	-.031	-32.0	3.5	.043
Manual Arts...	81	1	2	0.9	824	82.4	0.2	-2.3	-.027	-34.3	3.4	.042

PUPIL NO. 1. SPECIMEN DATA SHEET—Continued

Subject	A	B	C	D	E	F	G	H	I	J	K	L
Rhetoric.....	81	2	1	0.9	905	82.2	0.2	-2.1	-.026	-36.4	3.3	.041
Algebra.....	85	2	1	4.9	990	82.5	0.3	-2.4	-.029	-38.8	3.2	.039
Gen. Hist.....	83	2	1	2.9	1073	82.4	0.1	-2.3	-.028	-41.1	3.1	.038
Caesar.....	76	2	1	4.1	1149	82.1	0.3	-2.0	-.024	-43.1	3.0	.036
Mech Dr.....	89	2	1	8.9	1238	82.5	0.4	-2.4	-.029	-45.5	3.0	.036
Rhetoric.....	88	2	2	7.9	1326	82.7	0.2	-2.6	-.032	-48.1	3.0	.036
Geometry.....	70	2	2	10.1	1396	82.1	0.6	-2.0	-.024	-50.1	2.9	.036
Gen. Hist.....	85	2	2	4.9	1481	82.3	0.2	-2.2	-.026	-52.3	2.8	.034
Caesar.....	82	2	2	1.9	1563	82.3	0.1	-2.2	-.026	-54.5	2.8	.034
Mech. Dr.....	91	2	2	10.9	1654	82.7	0.4	-2.6	-.032	-57.1	2.8	.034
Amer. Lit.....	83	3	1	2.9	1734	82.6	0.1	-2.5	-.031	-59.6	2.8	.034
Geometry.....	71	3	1	9.1	1808	82.2	0.4	-2.1	-.026	-61.7	2.8	.034
Physics.....	75	3	1	5.1	1883	81.8	0.4	-1.7	-.021	-63.4	2.7	.033
Cicero.....	79	3	1	1.1	1932	81.7	0.1	-1.6	-.019	-65.0	2.7	.033
Amer. Lit.....	83	3	2	1.9	2045	81.8	0.1	-1.7	-.021	-66.7	2.6	.032
Geometry.....	56	3	2	24.1	2101	80.8	1.0	-0.7	-.008	-67.4	2.5	.031
Physics.....	78	3	2	2.1	2179	80.7	0.1	-0.6	-.007	-68.0	2.5	.031
Cicero.....	77	3	2	3.1	2258	80.6	0.1	-0.5	-.006	-68.5	2.4	.029
Eng. Lit.....	75	4	1	5.1	2331	80.5	0.1	-0.4	-.004	-68.9	2.3	.028
Amer. Hist....	74	4	1	6.1	2405	80.2	0.3	-0.1	-.001	-69.0	2.3	.028
Chemistry.....	71	4	1	9.1	2476	79.8	0.4	0.3	.003	-68.7	2.2	.027
Vergil.....	87	4	1	6.9	2563	80.1	0.3	0.0	.000	-68.7	2.1	.026

The following capital letters refer to the columns in the specimen data sheet:

- "A," the grade in each subject;
- "B" and "C," the year and semester in which the grade was given;
- "D," the difference between the actual grade "A" and the final average of all grades;
- "E," the progressive sums, by successively adding the grades "A";
- "F," the progressive averages of the grades as the different grades are added;
- "G," the differences between successive progressive averages "F";
- "H," the differences between "F" and the final average "M" (Table I) of all grades;
- "I" is "H" divided by "M," the gain or loss in per cent of the average grade "M";
- "J," the algebraic progressive sums of the deviations in "H";
- "K," the progressive averages of the sums in "J." This "J" value reveals the tendency of the student to raise or lower his grades.
- "L" indicates the tendency in "K," expressed in per cent of the average of all grades "M."

Method. The progressive sums were obtained by adding each succeeding grade to the sum of those given previously, as indicated in column "E," of specimen data sheet for pupil No. 1. Each sum was then divided by the number of its order (that is its distance from the first grade) to get the progressive averages in column "F," and the differences between these averages were found, column "G." In addition, the arithmetical averages of all the grades were found for each student. These averages for each student are given in column "M," Table I. In column "D" of the data sheet are given the differences between the actual grades "A" and the aver-

age grade "M." From these differences the average deviation was calculated for each student, and is indicated in column "N," Table I.

Since the significance of the average deviation depends upon the magnitude of the average grade "M," it was decided to divide the average deviation "N" by the average "M" of all the grades. This result is given in column "O," Table I. The value of "O" indicates the extent to which about one-half the grades varied around the average "M" of all the grades. To illustrate: the value .064 for Student No. 1 means that one-half of all his grades did not vary more than 6.4 per cent. from his average grade for four years.

In order to get an idea as to the rate at which a student's grade tends to become constant the values in column "I" were used. As the number of grades which are awarded to a student become greater, the successive averages "F" become more constant. Thus the average of 49 grades will be nearer the average of 50 grades than the average of 4 grades will be nearer the average of 5 grades, not necessarily, but there is a tendency in this direction. This tendency is indicated in column "F" of the specimen data sheet.

In column "P" is indicated the number of grades that were necessary so that the difference between the progressive average "F" and the average of all grades "M" would be less than 2 per cent. of the average of all grades "M." The value in column "P" was thus derived by simply counting downward in column "I" until the value .02 or less appeared for the first time. In some cases below the order given in "P" the value was more than .02. Column "P" simply indicates the number of grades given when the value of "I" was .02 for the first time. Two per cent. is arbitrarily assumed as a standard because it is doubted whether a discrimination of less than two per cent. is really a discrimination at all in mental measurement.

The fact that the values in "P" vary, would indicate an upward and downward tendency on the part of the students in their development. They do not develop equally or uniformly. This variation is partly due to the differences in the standards between the teachers or the many other factors which influence grades independently of the actual ability of the students, but since these secondary factors work both ways, they neutralize each other to some extent, and the variations in "I" probably represent differences in the rate of development. To get an expression of this tendency in a more homogenous form column "L" was calculated by dividing the progressive averages in "K" by the average of all grades

"M." Column "K" was derived by dividing the values in "J" by the proper order of the grades. That is, the values in "K" are the progressive averages of "J" with due regard to sign. Column "J" shows the progressive algebraic sums of the deviations in column "H."

Column "L" will thus show the tendency of the grades; a minus sign indicates they are getting poorer, a plus sign, that they are getting better. Thus, the value, $-.111$ in "L" means that student No. 1 has a final average "M" which is 11.1 per cent. less than the first grade received. The average of column "L" will thus indicate the tendency of the student during his high school career. This average of "L" for each student is given in column "S," Table I. Thus for student No. 1, this average is $-.041$, which implies that his grades are gradually getting poorer at the rate of .041 per cent. per grade. This value is so small that it has no significance, and hence it would be better to say that the grades of this particular pupil were practically of the same general character throughout his high school course. Column "T" indicates the number of grades necessary to establish this tendency within 2 per cent. of what it actually is after all the grades are given. This result is found by dividing the progressive differences in "L" by the averages of column "L," and then counting down the column until the per cent. is less than .02. Thus for student No. 1 after three grades are given this tendency is evident. It is worthy of notice that the tendency of 26 students (53 per cent.) is evident from the first, as indicated by the value zero in column "T." This factor would seem to have great disciplinary value in the administration of the school system, although it is somewhat difficult to calculate.

In order to use this factor, it is not necessary to have all the grades the student will have after he has completed his course. As seen from column "F," the average grade soon tends to become constant, and this means that the average of the first eight or ten grades is probably sufficient to indicate the tendency fairly well.

In column "Q" is given the number of grades granted to the student before the "I" value is less than 1 per cent. The method of calculating "Q" is the same as "P" except that in counting down in "I" the value .01 was used instead of .02. The "Q" value 26 for student No. 1 indicates that after he had received 26 grades his average grade was not changed by more than one per cent. It should be noticed that no pupil reached this point later than the 26th grade, and that some (12 per cent.) never varied more than one per cent. after the third grade. Column "R" is the same as "P" except that

the differences "G" between the successive progressive averages in "F" were divided by the corresponding progressive average in "F." The value in "R" indicates how many grades were necessary to give a deviation of less than 2 per cent. Column "R" differs from "P" in that the basis for "P" is the average "M" of all 32 grades, whereas for "R" the basis is the number of grades received up to the point for which the "R" value is considered. Thus for student No. 1 the "R" value means that after two grades had been received these grades differed from each other by less than 2 per cent. The "R" column represents the values which may be considered when only a few grades are available. This of course is the usual condition in a study of the earlier grades in order to foretell the relative accomplishment of a student in his later work. Since the grades used were assigned for a semester's work, the "R" value indicates that it is possible to foretell the student's relative position in his future work at the close of the first semester within 2 per cent., and at the close of the second semester within 1 per cent. of what it actually is after all the grades are given.

TABLE I

Student No.	M	N	O	P	Q	R	S	T
1.....	80.1	5.1	.064	5	26	2	— .041	3
2.....	81.2	6.3	.078	8	19	0	— .022	0
3.....	79.1	7.2	.092	3	16	4	— .015	3
4.....	94.8	1.9	.021	1	4	0	.002	0
5.....	80.0	6.1	.077	1	26	2	.070	4
6.....	79.1	7.5	.095	3	15	8	.002	0
7.....	94.9	1.5	.016	2	3	2	.002	0
8.....	75.0	5.8	.077	3	17	5	.000	0
9.....	84.6	4.7	.056	2	7	2	.001	3
10.....	81.0	6.2	.077	3	8	5	.002	3
11.....	83.0	5.7	.069	1	23	0	— .003	0
12.....	84.5	4.2	.050	5	5	4	— .010	3
13.....	90.3	3.5	.039	1	5	0	.004	0
14.....	82.6	6.8	.083	1	10	5	— .001	3
15.....	84.2	5.4	.064	1	18	6	.024	5
16.....	95.1	2.9	.031	1	10	5	.003	0
17.....	84.7	4.8	.057	5	26	0	— .023	0
18.....	94.2	2.5	.025	2	10	0	.004	0
19.....	85.1	4.9	.058	4	0	0	.000	0
20.....	84.4	4.7	.058	1	8	4	— .002	4
21.....	82.9	3.3	.040	1	6	2	.003	0
22.....	82.0	5.8	.071	6	4	2	— .010	3
23.....	83.4	4.2	.051	4	3	2	— .031	4
24.....	77.8	4.2	.054	5	11	3	— .028	0
25.....	78.8	5.3	.067	10	17	5	— .018	0
26.....	90.9	4.3	.047	1	10	0	.003	0
27.....	78.1	5.5	.071	5	13	4	— .034	6
28.....	80.9	5.7	.070	1	5	2	— .027	3
29.....	84.6	4.4	.052	3	12	2	— .012	3
30.....	80.5	4.1	.051	1	10	5	— .001	0

TABLE I—Continued

Student No.	M	N	O	P	Q	R	S	T
31.....	88.6	3.7	.042	3	10	5	-.008	0
32.....	78.8	6.1	.077	7	15	12	-.006	0
33.....	90.0	4.3	.048	2	12	2	.016	0
34.....	79.9	5.8	.067	1	20	2	-.001	3
35.....	84.5	4.5	.053	6	5	5	-.035	0
36.....	84.0	6.4	.076	1	12	7	.003	3
37.....	83.5	3.7	.044	9	12	4	-.012	0
38.....	81.5	4.4	.054	7	4	2	.017	3
39.....	78.9	4.6	.058	19	9	3	-.008	3
40.....	90.1	4.7	.052	2	2	2	-.016	0
41.....	76.5	2.5	.033	1	3	0	.002	0
42.....	79.7	3.7	.047	4	6	2	-.016	3
43.....	79.8	4.9	.061	9	10	5	-.036	3
44.....	83.1	3.9	.047	20	9	2	-.025	5
45.....	85.5	4.3	.050	4	3	3	.015	4
46.....	85.4	4.6	.054	2	10	2	-.011	0
47.....	89.0	6.0	.068	1	12	3	.000	4
48.....	86.1	3.2	.037	1	6	6	-.007	0
49.....	76.2	5.6	.074	2	7	3	-.011	0

The capital letters refer to the columns in Table I.

"M," average of all the grades in "A";

"N," the average deviation of all grades in "A";

"O" is "N" divided by "M," the extent in per cent of the average "M" to which one-half of the grades varied;

"P" is the number of grades necessary to make the value of "I" less than two per cent of the average "M";

"Q" is the number of grades necessary to make the value of "I" less than one per cent;

"R" is the number of grades necessary to make the value of "I" less than two per cent of the progressive averages "F";

"S" is the average of column "L";

"T" is the number of grades necessary to make the values of "L" less than .02.

Table II contains the same items as Table I, except that the figures are totals for the different groups indicated. The best individual student is considered the one which has the highest average "M" of all the grades assigned, the poorest individual the one with the lowest average "M," and the average individual is the one whose average grade "M" is nearest the median of all the averages "M" of the whole group. The best 25 per cent. includes the twelve students with the highest averages, the poorest 25 per cent. the twelve students with the lowest averages. The remaining 50 per cent. includes the 25 students between these two groups. The results in Table II are the averages for the different groups in question computed from the individual results given in Table I. In the case of the "tendency" (column S) it is the algebraic sum of the individual tendencies divided by the number of pupils in that group.

TABLE II

<i>Individuals:</i>	M	O	P	Q	R	S	T
Best.....	95.1	.031	1.0	10.0	5.0	.003	0.0
Average.....	85.1	.058	4.0	0.0	0.0	.000	0.0
Poorest.....	75.0	.077	3.0	17.0	5.0	.000	0.0
<i>Groups:</i>							
All 49.....	....	.057	3.8	10.5	3.1	-.006	1.6
Best 25 per cent.....	....	.039	1.7	7.2	2.3	-.001	0.6
Median 50 per cent.....	....	.061	3.8	11.5	2.6	-.006	2.2
Poorest 25 per cent....	....	.067	6.0	11.5	4.5	-.014	1.5

From column "S," Table I, it can be seen that 19 students (39 per cent.) have an average tendency to gain at the rate of .009 or .9 per cent. of the average per grade assigned; while 30 students (61 per cent.) have an average tendency to lose at the rate of .015 or 1.5 per cent. per grade.

Some Conclusions. 1. Half of the grades of the average high school student do not vary from the final average grade by more than 5.8 per cent.

2. The variation between the actual grades and the final average "M" is less than two per cent. for the first time at the 3.8 grade, column "P," Table II, or approximately at the close of the first semester.

3. After the average student has received 10.5 grades (column Q) his average "M" will not be changed by more than one per cent. no matter how many more grades he may receive.

4. After he has received 3.1 grades (column R) the average "M" will not be changed by more than two per cent.

5. The tendency of the average student is to become poorer at the rate of .006 of each grade. This is so small that it is really zero, and hence there is but very little change in his future work from his relative position which is evident from his earlier grades indicated in column "R."

6. The tendency for the individual to make higher or lower grades in the future is evident within two per cent. after the student has been assigned about three grades (column "R").

7. These conclusions apply only to those students who have actually completed their high school course. A similar investigation which includes all the students who enter the high school is contemplated.

PAPERS ON LANGUAGE DEVELOPMENT

By W. G. BATEMAN, University of Montana

1. THE FIRST WORD

During the first year of life a large part of the child's energy is expended on the steps preliminary to speech. In the orderly progress from the first cry to actual talking no one stage, perhaps, can be said to be more important than the others. But the most striking mark of the value of the process is certainly the advent of the first spoken word which becomes a conspicuous mile-stone on the journey of mental development. In this paper has been gathered together all the information available in regard to the first word in order to show something of its time of appearance and of its character.

DATA

As much as possible of the information secured is expressed in the following tables. Many more papers by authorities other than those cited have been read, but they are either silent on this particular topic or make only vague statements concerning it.

TABLE I
FIRST WORD OF ENGLISH SPEAKING CHILDREN

Authority	Ref.	Sex	Time	Word	Time of next word
Bateman.....	2	Girl	months 10½	hello	months same time
".....	3	"	10	daddy	"
".....	4	"	11	bye- bye-	"
Bohn.....	5	"	9	daddy	"
Boyd.....	6	"	11	dada or dog	"
Brandenburg.....	7	"	10	bye-bye	12
Darwin.....	9	Boy	12	mum (food)	later
Grant.....	14	Girl	12	bye-bye (?)	same time
Hall.....	15	Boy	8	bye-bye	9
Jegi.....	16	Girl	12	mama	same time
Major.....	19	Boy	14	baby	"
Mickens.....	20	Girl	11	mama	"
Moore.....	21	Boy	10	papa or mama	.....
Moyer.....	22	Girl	9	hark!	same time
Nice.....	23	"	14	mama	.....
Pelsma.....	26	"	10	daddy or dog	same time
Pollock.....	27	"	13	dada	"
Shinn.....	30	"	10	da (there)	"

TABLE II
FIRST WORD OF GERMAN SPEAKING CHILDREN

Authority	Ref.	Sex	Time	Word	Meaning of word	Time of next word
			months			months
Ament.....	1	Girl	11½	mam mam	food	15
Lindner.....	17	"	9½	papa	father	same time
".....	18	Boy	13	da	there!	15
Preyer.....	28	"	11	hatta	gone!	13
Schneider.....	29	Girl	10	da	there!	11½
".....	29	"	10	take-take	dancing	11½
Stern.....	31	"	9	ata	father	15
".....	31	"	10½	didda	tic toc	11
".....	31	Boy	11½	papa	father	12
Strümpell.....	32	Girl	10½	ssi-ssi	tea-machine	10½
Stumpf.....	33	Boy	9½	papu-papu	food	12
Togel.....	36	"	14	o (hoch)	up	15

TABLE III
FIRST WORD OF CHILDREN SPEAKING OTHER LANGUAGES

Authority	Ref.	Sex	Speech	Time	Word	Meaning of word	Time of next word
				months			months
Deville.....	10	Girl	French	13½	papa	father	same time
Taine.....	34	"	"	10	wawa	dog	11
Gheorgor.....	13	Boy	Bulgarian	13½	dza	there!	later
".....	13	"	"	15	boc	up (?)	"
Oltuscewski ..	24	"	Polish	13	papa	food	same time

DISCUSSION

The Time. The ages of the children at the time of using the first word vary from 8 to 15 months. The distribution is as follows:

TABLE IV
TIME OF USING FIRST WORD

Age.....	8	9	9½	10	10½	11	11½	12	13	13½	14	15	Total
English.....	1	2	-	5	1	3	-	3	1	-	2	-	18
German.....	-	1	2	2	2	1	2	-	1	-	1	-	12
Others.....	-	-	-	1	-	-	-	-	1	2	-	1	5
Total.....	1	3	2	8	3	4	2	3	3	2	3	1	35

The largest group is that at 10 months. Of the 35 children 15 or 42.85 per cent are in the 10-11 group while 26 or 74.28 per cent have begun articulate speech by the end of the first year. It is interesting to note that half of the 12 boys did not use their first word until after the first anniversary. None

of the nine-months group are boys and the latest of all to begin speech—during the fifteenth month—is of the same sex. Thus the boys in general appear to reach this stage later than their sisters. A comparison between the English and German speaking children shows little difference between the two unless it be a slight advantage in time on the part of the American children. Those speaking Polish and Bulgarian began decidedly late; but perhaps their task is harder than that of the others.

The only statistics heretofore gathered on this topic are those of Feldmann (12) published long ago in 1833. The times when 33 children began to speak were distributed as follows:

Month	14	15	16	17	18	19
Number of Children..	1	8	19	3	1	1

With the data collected for this paper these figures are in complete discordance. Since it appears impossible to now obtain the original paper we have no means of knowing whether Feldmann's "beginning to speak" is equivalent to the "first spoken word" or not; nor do we know from what class of the people his subjects came nor how the data were collected. Nevertheless, these figures are quoted in books and papers on child development since no others have been available. For children in the more cultured homes there seems no doubt that Feldmann's times are too late and are probably so for English and German speaking children in general. Compayré (8) states that children do not use spoken words intelligibly until the middle of the second year. This again seems too late. Tanner (35) quotes Feldmann. Tracy (37) puts the time of beginning the vocabulary in the second half year. This is more in accord with the data in the above tables but he states that, "many children a year old cannot speak a single word." O'Shea (25) considers the first eight months as the pre-linguistic period.

Although the largest group of children according to the figures of the present study used the first word at about 10½ months and the majority before 12 months, there are no rigid limits of normality. Bohn's child, although beginning 1-2 months earlier than the subjects of Bateman, Moore and Pelsma, was no further advanced than they at the end of the first year. Nice's daughter beginning at 3-4 months later than the last named children was, nevertheless, somewhat more advanced than they by the third and fourth birthdays. Hall's child, the youngest of all to begin articulate speech, developed rapidly not only in regard to talking but in other things as

well and so was, perhaps, generally precocious. Wyma (38) claims his subject to have used words intelligently in the sixth month. This is certainly very early; it is a date at which many of the children noted in the above lists had not even begun conscious imitation. It would appear that the child was unusually precocious or else the observations were faulty. At the other extreme is Preyer, who states that he did not begin to talk until nearly three years of age. A number of observers of speech development say they have seen children who did not talk at two years. Doran (11) states that he knew of "some children of average intelligence that did not talk until they were six or seven years old," which must almost certainly be set down as abnormal. None of these last mentioned records show whether the child concerned did absolutely no talking or whether it was only limited in vocabulary or lacking encouragement to talk. It is difficult to believe that a child who has made no attempts at articulate speech by the eighteenth month, and still more so by the twenty-fourth, can be entirely normal in all other respects. General feebleness of health, poor powers of hearing, defects in or lack of development of the vocal organs, or adenoids may lead to disability in speech. Children so affected are frequently backward in other respects as well. Perhaps a distinction should be made between no speech and unintelligible speech. The author knew a boy of $2\frac{1}{2}$ years who talked but was unable to make himself understood. His speech, which was very monotonous in intonation and consisted largely of a few simple sounds, suggested something in the nature of tone-deafness as the cause of its poor quality.

From the above data it would appear that a child of good heredity and environment who has not begun talking at 15 months of age is more or less retarded in this respect, and a like failure at 18 months should instigate an examination for probable cause.

The Word. The lists show that the words which these children happen upon as the corner-stones of their vocabularies are with few exceptions nouns and interjections with the former in the majority. All the English words used may be said to fall in these classes since Moyer, whose 'hark' forms the only exception, says that this and other early words were used mostly in an exclamatory way. Among the German children those of Tögel, Preyer and Schneider appear to have used words having at least a verbal coloring.

The most frequently named object is the paternal parent, He is named variously 'papa,' 'dada,' 'ata' and 'daddy.' The Polish child used 'papa,' too, but in a sense quite different

since to him it meant something to eat. Four children hit upon 'there' as a demonstrative sufficing for many purposes; three used 'bye-bye' but only one the opposite 'hello.' In three cases onomatopoeia was apparently the decisive factor leading to the first word. Darwin's child even coined a word for his debut into speech, the often quoted 'mum' which meant food. Pollock (27) suggests that this was not a true invention but was due to accidental noise made during eating.

In some cases it appears difficult to fix upon the first word. The ubiquitous 'papa' and 'mama' sounds coupled with coincidence are often confusing while imperfect enunciation sometimes prevents a decision. Some children, it would appear, made a sort of tentative effort at articulate speech before really arriving at that stage. Moore's notes furnish a good example. She states that as early as the twelfth week the child cried "eng" when hungry and "mää" when hurt. In the twenty-ninth month it seemed that "babba" indicated content and "momma," hunger. Then for two weeks beginning with the thirtieth he always said "ta-ta" after eating. In the fortieth week, however, "mu-mu" appeared to mean hunger. It was not until the forty-second week that "papa" and "mama" were used and then only vaguely. The sounds of the twelfth week were probably only differentiated cries. The 'tata' is interesting but was soon lost. No less than three different successive sounds were thought to denote hunger. In placing the data from this record in the table the word used first at forty-two weeks is considered the first word. Major's child is said to have used "hi" as an expression of desire at twelve months and Lindner's boy used "mm" at the same age in imitation of the sound of vehicles. These scarcely seem real first words and do not appear in the tables.

The author's two children made none of these half-efforts. From the sixth month on both babbled a great deal and began at this time to use when fed, comfortable and contented strings of sounds based in one case on 'dog' (doggley-ogglely-woggly) and in the other on 'zug' (uggle-zuggle-guggle). Following the example of other observers one might say that these sounds expressed a feeling of well-being or of satisfaction with things. However, they did not really express anything, being merely play just as the children played with all the babbling sounds. During the seventh month both children began conscious imitation and after that frequently said words that seemed intelligently used. A little observation showed, however, only coincidence at work. The older child used the

first word in the middle of the tenth month when riding one day in her go-cart. Seeing some people draw near she clapped her hands and cried, "Hello, hello." Her expression and actions showed that she knew she had done something new. After this when riding out she saluted almost everybody, increasing the number of 'hellos' to four. She never used the word under other circumstances except later when rehearsing her vocabulary. The younger child used the sounds 'papa' and 'dada' an incalculable number of times but never in reference to her father since he was not named either by others. On the first day of the eleventh month she put out her arms and called "Daddy" as he approached her and after that used the word constantly. She never applied it to her mother nor to other men, an embarrassing trait of some of the children mentioned in the tables.

The sudden advent of the first word in this way is similar to other creations of like nature. At one moment something *is not* and at the next moment it *is* and we do not know what miracle fills the infinitesimal gap. Perhaps what happens in that fraction of time is something quite simple and the miracle is really worked out in the long preparation.

The One-word-vocabulary. Stern (31) points out that a number of children use no new words for some time after the first word. Lindner's son (18) said only 'da' for two months and one of Stern's daughters was as long in acquiring a second word. His son took two and one half months while Ament's niece was three and one half months with a working vocabulary of only one word. Preyer's son after beginning at eleven months was two months in arriving at a second word and took six more for a third. These long waits are not characteristic of the English speaking children. The children observed by Shinn, Moore, Boyd, Pelsma, Moyer, Grant, Pollock and Bateman used two or more words very closely together while only Brandenburg's child appears to have waited as long as two months to add to the vocabulary. Two German girls, one French girl and the Polish and Bulgarian children experienced no one-word-vocabulary stage. Indeed the acquisition of new words by some of the American children shows quite the opposite tendency. For example, Pelsma's child learned ten words in ten or eleven weeks, Moore's boy six words in about the same time. Bateman's children learned ten and nine words in ten and twelve weeks respectively, while his niece learned eight words in seven weeks. Some of the German children make similar beginning and progress: as for instance Lindner's and Strümpell's daughters who both used more than one word to begin with; and also

Stern's elder daughter who acquired eight words in a period of ten weeks. A period of stagnation after the first word, therefore, appears to be rather the exception than the rule.

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A STATISTICAL STUDY OF CHARACTER¹

By JOSEPH KIRK FOLSOM

I.

METHOD OF THE INVESTIGATION

The subjects chosen for this research were the entire senior class at a small college, consisting of 76 men. In addition, the investigation covered the junior class there, consisting of 90 men, and a group of 27 psychology students at another college. The data for the two latter groups have not yet been studied, but will be as soon as time allows. They are expected to act as important checks upon the findings here reported, and also to furnish other results of interest.

The data gathered, and the methods of securing them, will be considered under the following heads:

A. Information about each subject not given by himself.

1. *Classmate Judgments* of character. A meeting of 20 volunteer judges from among the 76 seniors was held. Later 8 additional judges were secured to do the same work in private. These 28 men judged their 76 classmates (including themselves) in 12 designated traits of character. The judges were given prepared blank forms, containing a printed list of the 76 seniors, and 12 blank columns, and a typed list and description of the traits to be judged, which appears below. They were instructed to mark every man in the list (except the few who might be unknown to them) one of five possible grades, A, B, C, D, or E, in each trait. They were instructed briefly in the nature of the normal frequency distribution, and told to distribute their grades roughly according to that frequency. It was found that their tendency was to be even more sparing of A's and E's than the normal frequency requires, and to grade conservatively largely in B's, C's and D's. The judges were encouraged to make snap judgments and not to hesitate over doubtful cases. In this way about 1½ hours was the average time used to make the 12×76 or 912 grades. The list of traits follows:

J-I. General AGGRESSIVENESS: tendency to assume command and leadership spontaneously—self-assertion, masterly behavior toward others—boldness of front; as opposed to submissiveness, bashfulness,

¹ See note at close of article.

docility, tendency to follow others, to shrink and retire. This aggressiveness may be either of the pleasing or unpleasing kind: arrogance and conceit may or may not go with it; such should make no difference in judging the quality.

J-2. Love of crowds, large gatherings and society of one's fellows in general; as opposed to tendency to solitude or to very small group of friends—GREGARIOUSNESS.

J-4. KINDNESS: general tendency to show sympathy, pity, tender-heartedness—not necessarily of sentimental and "gushy" kind, however.

J-5. DESIRE FOR ADMIRATION, approval and popularity, as opposed to indifference to the same.

J-9. CHERFULNESS as opposed to depression, moroseness.

J-10. ENTHUSIASM as opposed to indifference and lukewarmness.

J-13. PERSEVERANCE as opposed to tendency to quit or change.

J-15. Handsomeness of PERSONAL APPEARANCE, as given by nature.

J-16. PERSONAL APPEARANCE, meaning neatness of dress, etc.

J-18. Degree of BODILY ACTIVITY, as opposed to laziness.

J-19. Degree of MENTAL ACTIVITY, in studies and outside interests together, as opposed to mental laziness.

J-X. General Intelligence.

2. *Professors' Judgments.* Blanks and lists of 7 traits were given to those members of the faculty who had a fair acquaintance with the upper classmen, with instructions to judge all the men they knew, by the same method as used by the student judges. In all, 30 faculty men made these judgments. No instructor judged more than about half the class, and many could judge only 2 or 3 men. Each student in each trait received anywhere from zero to 9 judgments, the average number being about 5. In the 5 traits which were finally used, practically all the 76 subjects scored at least 2 judgments.

The list of traits follows:

Pr-1. GENERAL INTELLIGENCE. Total intellectual ability of the man as well as you can judge it. Not to be confused with interest, effort, nor mere rote memory. High marks in studies may or may not be a close index of this. Other things being equal, of course they will.

Pr-2. GENERAL AGGRESSIVENESS. Same as J-1.

Pr-4. Degree of INTEREST IN INTELLECTUAL THINGS of any kind, whether in studies or side lines, as opposed to indifference to the same; not ability but *interest* and *curiosity* is meant.

Pr-6. SELF CONFIDENCE as opposed to lack of confidence.

Pr-7. PERSEVERANCE as opposed to tendency to quit or change.

3. *Objective Performance Records.* It has been impossible to secure the scholarship grades of the men kept by the college. To make intelligence tests upon the 76 men was not practicable. Two objectively determined variables were, however,

measured: (1) social popularity or leadership; (2) athletic achievement and activity. (1) was measured by scoring points, according to importance, for each position or office held by election (in a few cases appointment) by one's fellow students. The aim was to measure achievement as determined by popularity and as far as possible to eliminate the factors of specific abilities, scholastic or athletic. Of course this measurement was somewhat arbitrary, but was the best securable in a reasonable time. The records were taken from write-ups for the college year book, plus some assistance from question 15 of the questionnaire. The result of this measurement was an exceedingly skewed distribution, 12 men all getting zero points, many getting 3 and 4, whereas the best 25 per cent of the men made scores ranging from 11 up to 38 points. To make this variable easier to handle, the men were ranked from 1 to 76 and rearranged in a frequency distribution of 15 class intervals, with frequencies 1, 2, 3, 4, 6, 8, 9, 10, 9, 8, 6, 4, 3, 2, 1; whose mean is 0, standard deviation 3 intervals, and total range $2\frac{1}{2} \times$ the standard deviation on each side of the mean.

(2) Athletic score was obtained from the same write-ups; plus additional information given in the questionnaire. It was likewise determined by transmuting the point-measurement to a rank order and then to an arbitrary frequency distribution. The score gives credit primarily to athletic *ability*, but also to effort to make teams; it gives no credit to athletic activities outside of the regular organizations nor to mere liking for physical activity.

4. *Physical data.* The physical examinations and strength tests given to the men at their entrance to college, 3 years previously, were secured for 70 out of the 76 men.

B. Information given by the men themselves.

5. *Advertisement Tests.* Each man in the class was asked to perform an experiment essentially like that reported by Dr. Hollingworth in "Judgments of Persuasiveness" (29). The test was given in 2 sets of 24 slips each, the sets to be kept entirely separate and independent. Each slip contains copy advertising some abstract commodity, with a heading which emphasizes or sums up the point of the appeal. The 24 advertisements of series A correspond respectively to the 24 of series B; two corresponding advertisements are supposed to appeal to the same general motive—but are worded differently, both as to heading and body. The subject is asked to arrange the 24 advertisements in order of their per-

suasiveness or strength of appeal to him; then to do the same for series B independently. The slips and direction sheets were given out to the men in one of their classes, and the experiment performed by each man in his own time. With about half the men or more, an interval of over a week occurred between arranging the two series. The advertisement slips are given below:¹

1. LEADERSHIP. 1E3.—There are plenty of mediocre men, but there is always a need for leadership. 1E3 will insure your rapid rise to a position of importance and authority in your business. Why not start climbing today?

2. AMBITION. 2E1.—There's always room higher up. Capable leaders are always in demand. Why stay among the incompetent when 2E1 will bring you a better position and increase your salary? 2E1 will guarantee your recognition and rapid promotion.

3. POWER. 1X8.—Leaders of men throughout the world make use of our 1X8 system. It will help you get that sense of confident mastery and power which is absolutely essential to him who would hold a position of command.

4. MASTERY. 2X5.—When big problems arise and crises threaten, the master of the situation is he who can exert the most genuine influence and power over other men. Our 2X5 method will help you fit yourself to be a commander in the world of affairs.

5. DIGNITY. 1P3.—Many an otherwise able man has failed because of the lack of that dignity which is necessary to influence other men. Our 1P3 is noted for the dignified appearance and air of prestige which it gives its users.

6. DISTINCTION. 2P1.—Personality is what counts nowadays. One of the chief elements of a powerful personality is a dignified presence. 2P1 lends prestige and distinction to its users.

7. SELF-RELIANCE. 1U4.—The man who uses 1U4 need not wait upon his associates nor rely upon the whims of other people. The most helpful of all U's is the one which helps a man to help himself.

8. INDEPENDENCE. 2V1.—No self-reliant man likes to bother his friends or depend upon his neighbors for—. The man who possesses 2V1 can stand upon his own feet and face the world with confidence. 2V1 makes for independence.

9. POPULAR. 1G7.—The name is on all tongues. You will find 1G7 in the ladies' dressing room, in the scholar's study, in the nursery, in the kitchens of the humble, in crowded eastern cities and on limitless western plains. Used in millions of homes.

10. APPROVED BY THOUSANDS. 2G7.—From coast to coast traveling men hear the praises of 2G7. Why hesitate to try it when thousands of others are using it daily with genuine satisfaction? Popular approval is the best recommendation.

11. STYLISH. 1H8.—Our new 1H8 is fresh from the center of fashion, representing the latest creation of accepted artists of style, in exclusive pattern and dressy designs.

12. NOBBY. 2H5.—Made by our smartest designers, 2H5 products

¹ I am indebted to Dr. Hollingworth for permission to use some of his material.

are especially intended for those who love nobby and dressy models. Exclusive patterns and dashing styles, unequalled in snap and color.

13. CIVIC PRIDE. 1Y4.—Our 1Y4 is made in your own city, by local workmanship, and it is backed by strictly home capital. Stand up for your community and encourage home industry. Ask for 1Y4.

14. PATRIOTISM. 2Y5.—When you buy 2Y5 you get a product that is made for American consumers, of strictly American grown materials, by an American firm, employing exclusively American labor and American capital.

15. UP TO DATE. 1J6.—Are you a back number? Then why hesitate to try 1J6, which is recognized as the most up-to-date J— on the market. It will help your establishment to meet the approval of all thoroughly modern business men.

16. PROGRESS. 2J9.—Don't be a dead one. 2J9 is an essential part of every progressive and thoroughly modern establishment. Let us help bring your plant up-to-date by showing you 2J9.

17. CONSERVATIVE. 1B2.—1B2 is the only conservative and widely used article of its class on the market. Its value is demonstrated by many years of successful use. Don't invite the ridicule of sensible people by experimenting with new and untried makes.

18. NORMALITY. 2B3.—The value of 2B3 is proved by years of experience. The man who tries to be radical and independent in buying B's is simply eccentric. If you would hold the respect of the rank and file of normal people, trust their judgment and buy 2B3.

19. RARE VALUE. 1Z5.—Your new 1Z5 may cost a little more than the ordinary brand but it possesses absolutely superior quality and finer finish. One trial will convince you that it's worth the slight difference in cost.

20. QUALITY. 2Z7.—Why keep on wasting money when for the price of the older type of article you can get your own superior 2Z7. Goes just as far and lasts just as long but does more sensitive work and yields a finer product.

21. DURABILITY. 1W5.—Combine equal utility with durability by using 1W5. It lasts one-third longer than the ordinary article, combining equal quality with greater permanence and longer service. Stands the wear and tear of constant use.

22. STANDS THE STRAIN. 2W8.—Our chief argument for 2W8 is on the score of its ever-lastingness. It does the same work as other brands with equal ease and it costs the same as others of its type. But experience shows that it will stand harder use and longer service.

23. EXPEDITIOUS. 1T8.—Save the minutes and the hours will save themselves. Time is money and our latest 1T8 is the biggest time saver on the market. Does in 20 minutes what requires, with other brands, a half an hour.

24. TIME SAVED. 2T5.—Elimination of useless movements is the equivalent of many days added to a man's life. The ordinary — requires 17 distinct manipulations. 2T5 reduced this to 12 processes and reduces the time from 15 to 20 per cent.

25. EFFICIENCY. 1D9.—Actual earning power is what counts in modern business. Recognition no longer rests on pull and social influence. 1D9 will increase your efficiency 25 per cent. By no other means can you secure such prompt and sure increase of earning capacity.

26. GETS RESULTS. 2D8.—Actual results are what count in the

modern world. Good intentions and reputation are no longer the keys to success. 2D8 will increase the efficiency of your day's work and your consequent earning power by 25 per cent.

27. STANDARD. 1O6.—Our 1O6 article is manufactured by approved scientific methods and by scientifically tested processes and by technically trained men, working under the constant supervision of experts.

28. SCIENTIFIC. 2O3.—Our latest 2O3 is the result of generations of experience and of scores of experiments. After years of trial 2O3 stands distinctly in a class by itself as the final product of a long evolution—a triumph of mechanical genius.

29. INGENUITY. 1M1.—1M1 is equipped with every advantage and ingenious device known to modern invention. It embodies the latest improvements in pattern and is a model of skillful contrivance. Let your head save your heels.

30. INVENTIVE GENIUS. 2M4.—2M4 is not a makeshift but a real invention. It takes advantage of every known device to save time and trouble by the use of intelligence. It embodies also a new contrivance just invented for its special purposes.

31. MECHANICAL ACCURACY. 1V6.—No. V—, however well built, gives satisfaction unless it can be controlled quickly and accurately by the operator. 1V6 does not run by guesswork but its mechanism is so nicely adjusted that it responds to your slightest touch.

32. CONTROL. 2V7.—Our 2V7 device will enable you to operate your — with ease and precision. Why continue the old clumsy and unsatisfactory methods of adjustment when 2V7 will give you perfect control of every part of the mechanism.

33. HYGIENIC. 1O3.—As a general tonic 1O3 is unequalled. It nourishes the system, enriches the blood, builds up firm healthy tissue and gives tone and color to the whole body.

34. HEALTH. 2O8.—The bad effects of shock and worry can be combated only by building up strong native resistance. 2O8 when appropriately used, invigorates the system, giving it vigor, firmness, and heightened tone and resistance.

35. TEMPTING. 1N7.—Try 1N7. It comes fresh from the field and its appetizing flavor is a treat to the palate. It makes a dainty breakfast, a delightful luncheon and a delicious dessert.

36.—APPETIZING. 2N4.—Ripe solid—with the dew standing on them. When you open them the juice glistens temptingly and the delicious flavor is unexcelled. The 2N4 process retains all their native quality and freshness and all their delicate aroma.

37. PURITY. 1F3.—This is the only sanitary 1F3 on the market. Put up in germ-proof, dust-proof, hermetically sealed packages and made of strictly pure and unadulterated ingredients.

38. CLEANLINESS. 2F7.—No human hand touches 2F7 until you take it from the package. It is prepared by thoroughly hygienic processes, in well ventilated and dustless premises, with the most painstaking sanitary precautions.

39. ECONOMICAL. 1S3.—A dollar saved is a dollar earned. 1S3 will help you save your money. Why not cut down expenses items and start a bank account. 1S3 will help you do it.

40. BARGAIN. 2S9.—No 2S9 was ever offered before for half the money. We are enabled to offer this proposition only by virtue of our mammoth plant and our enormous producing capacity. As good as others and only two-thirds their cost. Why pay more?

41. SELF-DEFENSE. 1A6.—Your life is always threatened by some lurking danger. 1A6 in your home secures you and enables you to protect the rights and person of yourself and of those whose safety is your chief concern. Forearmed is forewarned.

42. SAFETY. 2AS.—Avoid danger by using the only absolutely safety-built, accident-proof 2AS. Don't court danger by taking chances. This is the only 2AS in which you get all the protection and none of the risk.

43. SYMPATHY. 1Q6.—Kindness is the first law of humanity. Much of the pain and discomfort inflicted on dumb animals can be relieved by the general use of 1Q6. Be human to your beast. Use 1Q6.

44. PHILANTHROPY. 2Q5.—Our 2Q5 is manufactured for our trade by the inmates of the Mendow Institution for Crippled Children. This article is one of the very few things that these little invalids are able to produce and every 2Q5 sold adds to their comfort and welfare.

45. AFFECTION. 1H3.—1H3 makes a suitable gift for parent brother, sister or friend. Those whom you profess to love are helped by being reminded occasionally of your feeling in some concrete manner. No better token of affection and kindness can be found than a gift of 1H3.

46. FRIENDSHIP. 2H7.—Show your gratitude and regard toward your friend by making him or her a present of 2H7. Not words but acts of thoughtfulness and kindness are what count in cementing real friendship.

47. WEIRD. 1L2.—If you want to read something strange, weird, and fascinating, get a copy of our "Travels in —". It describes real situations and experiences so unusual that nothing like them is known even in fiction.

48. INTENSELY INTERESTING. 2L4.—Our new — will explain briefly the five most marvelous discoveries of modern times. The secrets and mysteries of Oriental magic are unraveled by the most unexpected findings of science. The pages will prove a continuous source of wonder and interest.

6 and 7. *Questionnaire Data.* A month after the advertisement tests, a questionnaire was given to each man. These ask questions of two general kinds. (6) to secure information about personal history which might be of significance in determining character. (7) to secure data of present interests and ideals, likes and dislikes (i. e.—stimuli). 73 out of 76 men finally gave adequate responses to the advertisements and questionnaires. The questionnaire is reproduced below:

Name..... Class.....

1: List all your brothers and sisters, including also any other children, *who grew up in the home* with you, if any; giving the age of each with respect to your own. (Names, etc., not wanted). Thus: Brother, six years older; sister, two years younger, etc. Exclude any who died before age 2.

2: Where did you live most of the time from age three up to age fifteen? Farm, town or village under 8,000, city 8,000 to 100,000 population, or city over 100,000

3: Which do you prefer to live in now? Country....., City.....?

4: Tell the nature and extent of all (a) employment, (b) home duties, you have had before entering college: Kind of work....., between what ages..... Average hours per day.....

(a)
(b)

5: What employment have you had in college?

6: What per cent. of your play time, on a rough guess, did you spend

	Age 6-12	Age 12-17
(a) in gangs or large groups
(b) with chums or groups of 4 or less
(c) alone

Indicate in both cases whether this was from preference or necessity.

7: Did you, up to the time of your entrance into college, take an interest in constructing or building things, or engage (for pleasure, not necessity) in mechanical or constructive activities of any kind?..... If so, give list of things constructed and activities engaged in that you can remember.

8: What is your intended vocation? If not decided yet, what is the difficulty, and what possible lines of work are you considering? Please mention briefly, *in order of their importance*, the chief motives of your choice..... If your choice is not your real preference, what would you most like to do?

9: Go through the following list of activities and give everyone a mark as follows:

Your extreme favorites, + + + Those you like very well, + + Those you rather enjoy, but are not very keen about, + Those you dislike, take no pleasure in,—

Notes: Consider yourself a participant, except where otherwise specified. No feminine companion assumed except in dance. Consider your enjoyment of the activity for its own sake, without regard to whether it is compulsory or not.

Mark:

Baseball
Football
Basketball
Tennis
Swimming
Rowing
Canoeing
Bicycling
Track and running games
Jumping and vaulting
Gymnasium work (apparatus)
Skating
Boxing
Wrestling
Fencing
Handball
Bowling
Rifle-shooting
Tramping in woods and fields
Mountain climbing
Camping

Mark:

Agricultural activity—garden-
ing, etc.
Collecting any natural objects
Caring for and watching Ani-
mals
Photography
Building or making something
Experimenting with mechanical
or electrical apparatus
Experimenting in chemistry or
biology
Public speaking or debate
Writing, composing, journalism
Taking part in amateur drama-
tics or entertainment
Attending club, fraternity class
meeting, smoker, etc.
Running or directing social and
business affairs, meetings, etc.
Social dance

Mark:

Hunting
 Fishing
 Travelling
 Pool or billiards
 Card games
 Reading, good fiction
 Reading anything else. What?
 Chess, checkers, etc.
 Musical practice
 Artistic work—drawing, design-
 ing, decorating, etc.

Mark:

Watching—
 A good play
 Good moving pictures
 Good opera
 Varsity game of the kind you
 like best to watch
 Business contact and interviews
 with men
 Meeting strangers
 Anything else

10. (a) Number the following nine groups of studies in the order of *your* interest in them. (Use pencil—erase and change till you get the order to suit you). Be sure to number all of the nine. Consider each subject in its broadest sense—as including all its special branches and applications: (b) Mark all those which you actually like and mark those which you dislike, thus indicating where the zero point comes in your scale of interest. (If you have not studied some of these in college, judge from outside reading and general acquaintance.) Be careful to give every one of the nine a mark for both (a) and (b).

(a) Rank (b) or—
 Number

- A. Mathematics
- B. Foreign languages
- C. English literature
- D. History
- E. Physics, mechanical and electrical sciences
- F. Chemical sciences
- G. Biological sciences
- H. Psychological sciences (including ethics, religion, pedagogy,
 philosophy, etc.)
- I. Economics, political social sciences

II.

THE VARIABLES AND THEIR CORRELATIONS

Treatment of data, results, and discussions.

The data of the investigation can best be conceived, as noted previously, as so many *variables* of behavior traits, interest, physique, etc., each in practice appearing as a column of numerical values running parallel with the column of 76 names of individuals in the group. Some variables are directly determined from the original data, while others are various composites (usually by addition or subtraction or corresponding values) of two or more other variables. In the case of a great many of the variables, from 2 to 6 of the individuals out of the 76 lacked records (in the physical records 6 are missing). In most cases, the procedure employed was to assign arbitrarily the missing values. These values assigned were the integer nearest the group average in that variable, except in a very few cases where there was good reason for an

estimate of a value farther from the mean. The tendency of such arbitrary assignments is of course to lower slightly any correlations that exist.

1. *Classmates' judgments.*
2. *Professors' judgments.*
3. *Objective records.*

The lists of traits to be judged, given above, were selected from the following provisional viewpoint:

(1) Traits aggressiveness, gregariousness, kindness, desire for admiration, mental activity, manipulative, intellectual interest, refer to the strength of certain instinctive tendencies, considered as units of behavior. Self-confidence is considered as an aspect of the aggressive or self-assertive tendency.

(2) Perseverance, cheerfulness and enthusiasm are considered as more basal, temperamental characteristics common to many or all instinctive behavior tendencies.

(3) The others are variables of appearance, activity, and finally, intelligence, whose relations to the other traits were thought worth investigating.

It is to be noted that the traits are purposely described as far as possible in terms of behavior: they are meant to be thought of as *characteristics of behavior* rather than as "qualities" of "character" or "mind."

The judges were kept in two halves of 14 judges each. In the second half were put the 8 judges who had worked by themselves and two who spent only a part of the time at the meeting, and a random four others. The first half consisted of 14 judges, all of whom did their work entirely at the meeting and thus received more oral coaching and explanations. Of course the others were given full instructions also, but had no chance to ask further questions. Now the grades given to each individual were averaged. In doing this, the grades A, B, C, D, E, were translated into numerical values 5, 4, 3, 2, 1, respectively, and the final result multiplied by 100. Thus the scores obtained by averaging these grades would have in each case a possible range of from 500 (for a subject getting all A's) to 100 (if he got all E's), with a mean of about 300. The average was taken for the two halves of 14 judgments each, and then for the whole 28. This latter of course gives the complete final score of each subject in each trait. When any trait-variable is mentioned hereafter, it will refer to this final average score of all the judgments for each subject in that trait.

Naturally there were many omissions made by the judges, and the actual number of judgments to be averaged was not

always 28, but often a few less. For only 11 of the 76 subjects, however, was this number less than 26, and the lowest was 18.

The purpose of keeping the judgments in two groups was to determine the reliability of the total score by finding how closely its two halves agreed with each other. In other words, it was found how closely the first 14 judges as a group agreed with the other 14. This was measured by computing the correlation between the two partial scores called the reliability correlation.

The method of correlation was as follows:

The Pearson coefficient is used in all cases, but its computation is abbreviated by grouping all values into class intervals of 25 points each. In all cases 300 is taken as arbitrary origin—as center of the middle interval; 325 is then center of the +1 interval; 350 of +2; 275 of -1, etc. The extreme classes are 8 and -8, thus making a total of 17 classes. Some traits, however, cover a range of only 9 intervals; most of them about 12 or 13. Every value is assigned to the nearest class center. Thus 312 is in the 0 class and 313 is called +1. This coarse grouping method attenuates the correlations, but has been used in all cases with the judgments for the sake of time. In studies of this kind, the data dealt with are so imperfect that great accuracy of the correlation coefficient is not worth the sacrifice of time necessary to secure it, at least when the primary purpose of the research is psychological and explorative rather than statistical and finely determinative. Furthermore, the correction for attenuation covers this error also. This method of grouping and correlating is taken from Yule, (75, 1912 edition, p. 181 ff.)

NOTE.—In correlating the traits with other data, as described later, as a rule a much finer grouping was followed in computing the coefficients.

All correlations were computed by first distributing the pairs of values graphically. By adopting certain standard practice, cross section paper, etc., it was possible after the means and standard deviations for each trait were obtained, to do all the remaining work of computing the 66 inter-correlations of 12 traits in about 16 minutes for each correlation. The great advantages of this graphic method are (a) that one can tell by inspection the general nature of the relation of the 2 variables—as to whether it is linear or no, etc., and (b) instead of having to compute each of 76 product sums individually, they are classified and assembled in such a way as to save much time. The reliability correlations of the traits were computed in the same way. The computing of means and

standard deviations was in all cases by the coarse-grouping method used in computing the correlations.

It is evident that the traits on which the judges best agree, as shown by high reliability correlations, are also those which are given the greatest range of distribution, as shown by the standard deviations; and we infer that these traits are easier to judge and hence the judges are less bashful about giving the extreme high and low grades. The highest agreement is on such directly observable traits as appearance, and the poorest, on such traits as kindness and cheerfulness, less obvious to the observer.

In computing the reliability correlations for the professors' judgments the first half (including the odd judgment if the number was odd) of all the judgments for each subject in each trait, was averaged, and then the remaining judgments were averaged separately. Despite the great irregularity of the data, the reliabilities are fairly high, but of course not as high as with the student judgments where the number of judges for each man averaged about 26 instead of 5.

The objective record scores were not put into random halves to get their reliabilities.

TABLE 1

CHARACTER TRAITS: CONSTANTS AND RELIABILITY CORRELATIONS

	Mean	Standard deviation	Reliability correlation
J 1. Aggressiveness.....	293.1	70.0	+ .913
J 2. Gregariousness.....	308.2	63.0	+ .908
J 4. Kindness.....	308.2	39.5	+ .706
J 5. Desire for admiration.....	308.5	62.5	+ .856
J 9. Cheerfulness.....	308.9	52.7	+ .741
J 10. Enthusiasm.....	299.0	62.0	+ .886
J 13. Perseverance.....	315.5	46.7	+ .798
J 15. Handsomeness.....	296.7	71.2	+ .922
J 16. Pers. appearance—artificial	320.1	68.2	+ .930
J 18. Bodily activity.....	293.8	54.5	+ .760
J 19. Mental activity.....	312.5	53.8	+ .825
J X. General intelligence.....	314.1	45.0	+ .794
Professor's Judgments			
Pr 1. General intelligence.....	338.5	80.0	+ .59
Pr 2. Aggressiveness.....	324.0	68.8	+ .47
Pr 4. Intellectual interest.....	334.6	65.2	+ .42
Pr 6. Self confidence.....	342.7	66.3	+ .60
Pr 7. Perseverance.....	345.0	77.5	+ .61
Objective Records (In class intervals)			
Pop.= Popularity.....	0	3.07	
Ath.= Athletic achievement.....	0	3.27	

1 class interval = 25 p. or original units

Table 1-A gives the same data for a group of 28 students at another college, who were judged by 27 judges (themselves) in 14 traits. The list of traits used was somewhat different. Here, the average number of judges rating each individual was about 18, instead of about 26 as in the larger group. It will be observed, that, as with the other group, the traits aggressiveness, gregariousness and handsomeness show high reliabilities, while kindness is much lower. It is significant that the trait "Depth and strength of EMOTIONS in general as opposed to coldness" was judged with no agreement whatever. This would seem to be evidence against considering emotions in general as a significant variable; but it may be merely that it cannot be measured in this way.

TABLE 1-A
GROUP OF 28 MEN. CONSTANTS FOR TRAITS

Trait	Mean	Standard deviation	Reliability correlation
1. Aggressiveness.....	307.2	53.1	.87
2. Gregariousness.....	309.4	51.7	.81
3. Kindliness.....	329.3	32.6	.39
4. Desire for admiration.....	322.4	38.6	.60
5. Curiosity—interest.....	333.2	41.2	.63
6. Tendency to be disgusted ...	310.3	41.3	.58
7. Readiness to anger.....	290.7	35.6	.60
8. Tendency to fear—timidity..	292.4	41.7	.66
9. Bodily activity.....	302.9	51.0	.93
10. Strength of emotions in general	313.4	21.8	— .03
11. Cheerfulness.....	312.7	39.3	.59
12. Perseverance.....	326.9	39.1	.56
13. Natural handsomeness.....	290.9	56.5	.87
14. Strength of sex instinct.....	314.5	39.0	.69

Table 2 gives the intercorrelations of all the traits, including those judged by the professors and the two objectively determined variables popularity and athletics. Table 2-A gives these coefficients corrected for attenuation due to unreliability in the estimate-averages. The correction formula used was

$$r_{xy} \text{ corrected} = r_{xy} \text{ obtained} \sqrt{\frac{1 + r_{x_1 x_2}}{2 r_{x_1 x_2}} \frac{1 + r_{y_1 y_2}}{2 r_{y_1 y_2}}}$$

where r_{xy} is the correlation between two traits, and $r_{x_1 x_2}$ is the correlation between the two partial measurements of the trait x and $r_{y_1 y_2}$, the same for y . (70, p. 80; and 53.) Where simply 'aggressiveness,' 'general intelligence,' or 'perseverance' are mentioned, they will refer to the students estimates unless otherwise specified.

TABLE 2
RAW COEFFICIENTS. CHARACTER TRAITS—INTERCORRELATIONS

	J1	J2	J4	J5	J9	J10	J13	J15	J16	J18	J19	JX	Pr1	Pr2	Pr4	Pr6	Pr7	Pop.	
Classmates' Estimates'																			
J 1. Aggressiveness	+.82																		
J 2. Gregariousness	+.23	+.32																	
J 3. Kindness	+.84	+.79	+.08																
J 4. Desire for admr., etc.	+.73	+.83	+.57	+.44															
J 9. Cheerfulness	+.89	+.80	+.44	+.20	+.82														
J10. Enthusiasm	+.41	0	+.12	+.34	+.11	+.37													
J13. Perseverance	+.55	+.64	+.26	+.59	+.47	+.44	-.02												
J15. Handsomeness	+.49	+.64	+.26	+.59	+.45	+.41	-.03	+.89											
J16. Per. appear., artificial	+.84	+.65	+.37	+.69	+.71	+.81	+.35	+.50	+.49										
J18. Bodily activity	+.42	+.09	+.13	+.28	+.20	+.42	+.88	+.07	+.12	+.31									
J19. Mental activity	+.63	+.34	+.17	+.46	+.39	+.55	+.74	+.32	+.37	+.46	+.79								
JX. General intelligence																			
Professors' Estimates																			
Pr1. General intelligence	+.24	+.59	+.07	+.70	+.54	+.69	+.72	+.45	+.31	+.55	+.48	+.67	+.52						
Pr2. Aggressiveness	+.10						+.67	+.16			+.72	+.58	+.70	+.35					
Pr4. Intellectual interest	+.32												+.55	+.20	+.64				
Pr6. Self confidence	+.03						+.52	+.19											
Pr7. Perseverance																			
Objective Records																			
Pop. = Popularity	+.72	+.65	+.32	+.56	+.51	+.52	+.17	+.68	+.59	+.70	+.09	+.36	-.03	+.33	-.09	+.17			
Ath. = Athletics	+.51							+.44		+.68		+.15	+.06						+.65

TABLE OF PROBABLE ERRORS of all correlation coefficients where $n=76$, which is always the value of n except when otherwise specified.

It is unnecessary to compute the probable error for each coefficient given, this being little more than a conventional formality. By referring to the following table of generic values of the P. E. for each .10 in the value of r , the P. E. of any coefficient can be quickly interpolated with sufficient accuracy for any purpose covered by this investigation.

$n=76$	
$r=1.00$	p. e.=0
.90	$\pm .015$
.80	.028
.70	.039
.60	.050
.50	.058
.40	.065
.30	.070
.20	.074
.10	.076
0	.077

Discussion of the intercorrelations. This table has not been treated by Spearman's method of computing the correlations of the correlations to search for general factors. Inspection shows, however, that for many pairs of traits such as J1 and J10, this value would be very nearly unity and thus satisfy Spearman's criterion.

Practically all the correlations are positive and many nearly unity. The traits most opposed to each other have a neutral and not a negative correlation. The trait whose average correlation with the other 11 student-judged traits is highest is aggressiveness. This also has the second highest correlation with the objective popularity record or elective leadership. Popularity goes best with bodily activity ($+.76$) and third best with handsomeness ($+.69$). Very clearly, the tendency to take part in and succeed in athletics, to be elected and appointed to offices and societies by one's fellows, and the tendency to be judged handsome, aggressive, sociable, cheerful, enthusiastic, and bodily active by them, are all highly related to each other, so highly, in fact, that we suspect that the success in college social life has biased the estimations of all the traits. We do not know how far this "character" is the cause and how far the result of the student's social attainments.

However, the inspection of Pr2, the professors' estimate of aggressiveness, shows that this highly agrees with the classmates' estimate. The professors are not ignorant of the college activities of their students, however, and are hence open to the same bias, but not to such an extent. It is significant

that Pr2 correlates considerably less with popularity and with handsomeness than does J1, and correlates more with the professors' estimate of general intelligence.

Inspection shows that the two opposite poles of the system, so to speak,—the most opposite groups of traits that can be found—are the aggressive social traits on the one hand and the intellectual traits on the other. The correlations of mental activity and perseverance as estimated by classmates show that they are very much the same thing. The instructors' estimate of intellectual interest, Pr4, is also closely related to these, but with the difference that it is much less correlated with aggressiveness and enthusiasm. Professors' estimate of perseverance seems to be slightly distinct from all these. This intellectual group is nevertheless positively correlated, though low, with aggressiveness. It comes nearest to negative correlations with gregariousness and personal appearance. The most negative correlations are between handsomeness and Pr4 and Pr7 (—.16 and —.19).

Although the correlations of the correlations were not computed, a rough step in this direction was taken as follows (using here the raw coefficients): The 8 traits most clearly interrelated at the social pole of the system (J1, 2, 5, 9, 10, 15, 18 and "pop") were taken in all possible combinations of pairs, and the average of the 12 differences between the correlations of the two members of the pair with 12 other traits were found. These figures hence give an index of the relative agreement of the two traits in their correlations with other traits. Measured thus, the closest relations were, in order, as follows:

Aggressiveness and enthusiasm.....av. diff	.076
Bodily activity and cheerfulness.....	.086
Popularity and handsomeness.....	.092
Bodily activity and desire for admiration.....	.094
Bodily activity and aggressiveness.....	.097
Bodily activity and enthusiasm.....	.098

The sum of these average differences for each trait with the other 7 of the group were then computed. On this basis handsomeness was found to be much more distantly related to the group than any others. It was then thrown out, and the same data computed for the other remaining 7 traits. The results of this show that the most closely related to all the others of the group—the most central—of the group is bodily activity; then follow in order desire for admiration, cheerfulness, gregariousness, enthusiasm, aggressiveness, objective popularity score. This is all very rough, but it seems to indicate that although handsomeness and popularity are highly

related to all the social traits, that neither is the central nucleus or general factor of the system. Neither is aggressiveness, which seemed at first to be the feature of central interest. The general factor if such exists would seem to be something more in the nature of sthenic emotionality or activity, or energy. This conclusion is only tentative, and awaits testing by other data. We have always to consider that such results as this may depend on what traits are included in the system, which is usually a selected and limited one as compared with the whole compendium of human behavior traits.

The other general factor, if such it may be called, is something in the nature of persevering intellectuality—not so much intellectual ability but interest and effort. This has a low positive correlation with the social-emotional factor. General intelligence runs in between the two, so to speak; correlating with both but more highly with the intellectual factor. Professors' estimate of intelligence is almost identical with the latter.

Of the traits judged by both professors and classmates, aggressiveness (J1 and Pr2) shows the highest agreement (+.97 corrected); general intelligence is next best (+.83), and perseverance is only +.63. The agreement between professors' "intellectual interest" and classmates' "mental activity" is higher than any of the above, being +.99. The perseverance of the professors' estimate seems to be a somewhat better distinguished trait than J13, for the latter correlates better with Pr4 and Pr1 than with its namesake Pr7. Perseverance was evidently taken by the students as meaning something very close to intellectual application. General intelligence as judged by students seems to be biased by the social qualities, as witness its correlations of +.67 with aggressiveness, +.35, with handsomeness, and +.38 with popularity. The professors' estimate of intelligence on the other hand is neutral to handsomeness, popularity and athletics. This is similar to the result found by Webb in his study, discussed later. He found that the judgments of students in intelligence qualities by their student prefects were biased by sense of humor, from which bias the lecturers were free. Self-confidence justified the a priori expectation of it—that it would be correlated with aggressiveness, being supposedly a product of the same instinct—masterly behavior or self-assertion.

4. *Physical Data*

The physical measurements and strength tests had been taken on these men three years previously, 6 out of the 76 had records missing.

The measurements were treated according to the method of Mr. C. K. Taylor, as outlined in his handbook "The Physical Examination and Training of School Children." (57). The data were not sufficient to allow our getting the full advantages of this treatment, since two of the most important measurements were lacking: namely, (1) the difference between biceps contracted and biceps relaxed, and (2) the difference between chest fully expanded and chest fully deflated. A variable "Taylor Points" was computed, using the 6 available measurements: upper chest expanded, right biceps contracted, left biceps contracted, hips, thigh average, calf average. From these data the following results were found:

(1) The correlation between the Taylor score (i. e., a score which evaluates not the absolute measurement, but the extent to which it exceeds the *norm* for the *height and weight* of the given individual), for chest and the two biceps with that for hips, thighs and calves, was zero. Hence there is revealed here no factor of *general development* affecting all parts of the body.

(2) The correlation of "Taylor Points" with stature is $-.47$. Mr. Taylor thinks this is sound, and indicates a real lack of development, in his sense, of the taller men. The correlation of Taylor points and total strength is about $+.10$, but would approach $+.40$ except for 7 individuals who depart widely and inconsistently from the regression lines. The Taylor score has no correlation with weight, and $+.39$ with vital index $\frac{L. C.}{Height^3}$.

Correlation of Taylor Points with aggressiveness $=+.18$. Stature and aggressiveness—very low positive correlation estimated, not over $+.15$. Aggressiveness and total strength, estimated 0 or very low. Bodily activity and total strength, estimated low positive (not over $.15$).

Aggressiveness and $\left\{ \frac{\text{weight}}{\text{height}^3} \right\}$ R estimated $=0$.

Bodily activity and $\left\{ \frac{\text{shoulder measurement}}{\text{waist measurement}} \right\}$ very low positive.

Cheerfulness and $\left\{ \frac{\text{weight}}{\text{height}^3} \right\}$ R $=0$.

The latter is the supposed correlation between stoutness and cheerfulness. By the percentage of unlike signs, however, this correlation is $+.30$. We have here the same phenomenon as elsewhere in the investigation: according to the *number* and *direction* of pairs of deviations, there is correlation; but

when these are weighted for *degree* of deviation, the correlation is reduced considerably. That is, the exceptional or minority cases deviate so widely from the general trend of the majority as to neutralize the effect of the latter. In such cases a correlation coefficient computed from a simple four-fold association table may have more meaning than one computed in the usual manner.

5. *Advertisement Experiments.* At the outset of this investigation the leading purpose was to find possible tests for character analogous to the many tests now used for intelligence. It was thought possible that an individual's reactions to various words, phrases, pictures, etc., might be some indication of his general behavior tendencies. If any such tests should correlate with estimates of behavior, then we might be on the track of a method of inferring character from tests without the need of prolonged acquaintance and observation. The initial suggestion toward such an attempt was given by H. T. Moore's suggestion for testing the strength of instincts (42). He takes 10 instincts as provisional units of behavior and tries to test the strength of these instincts by a special form of association test.

It seemed very dubious to the writer that the reactions to these word stimuli would bear any simple relation to the strength of the instincts which the word supposedly arouses. If any tests of this nature were valid, it seemed that a direct statement of likes and dislikes—a frank comparison of various stimuli by the subject according to their strength of appeal to him, would be more likely to indicate the strength of his instincts than would the association test.

Dr. Hollingworth has used the advertisement tests extensively, but has never treated them for individual differences. It seemed worth while to study this kind of data from the differential viewpoint, whatever the final outcome.

Forty-eight advertisement appeals were used as described above. Most of them were taken from Dr. Hollingworth's sets, and the rest were made up specially for this investigation. They were selected with a view to stimulating certain important instinctive-emotional tendencies, as far as such tendencies can be stimulated in this way. (See table below). Thus advertisements Nos. 1-8 are designed to stimulate self-assertion or masterly behavior; Nos. 9-18 are appeals to the social instincts; Nos. 19-32 appeal to interests in *things, mechanisms* and *advantages*, or the material itself; Nos. 27-32 especially appeal to the manipulative-constructive tendencies; Nos. 43-46 to the affectionate-kindly tendencies, and the appeals of others are obvious.

A priori it might seem that an individual whose instinct of self-assertion were strong (if such an instinct is in any sense a unit of behavior) would be judged high in aggressiveness by his classmates, and also would tend to be influenced relatively intensely by verbal appeals to this instinct. But also we might expect inhibiting and compensating factors which would eliminate this correlation and even make it negative.

The rank (1 to 24) given to each slip by each subject was recorded; then the ranks of two corresponding slips of the two sets were summed (Nos. 1+2, 3+4, etc.) The last column below (Table 3) gives the reliability correlation for each of these pairs: i. e., the correlation between the rank given to a given slip in the odd series and the rank given to its corresponding slip in the even series. This coefficient tells how nearly the two slips actually do approach to being the same general appeal, as they are supposed to be. It is evident that in several cases, the differences in wording have greatly changed the value of the appeal and obscured the common element which the writer tried to put into the two.

All the intercorrelations between advertisement ranks, except where noted, are computed by the method of percentage of unlike signed pairs, using Professor Thorndike's table. (61, 2d edition, p. 171, 228).

This method gives theoretically, a short cut approximation to the Pearson coefficient. The variable error between the value thus obtained and the fully computed coefficient will be, however, large in this study, because of the small number of cases. But, as noted elsewhere, with some correlations found in this study, the short cut method has in addition a large constant error in the direction of making the values higher than would the full computation. Where a coefficient is designed as "estimated," it means that it was obtained by this method, using Thorndike's table; "computed" means it was obtained by the regular Pearson formula. In correlating ranked data with other variables not using ranks, the sign will of course be reversed, since the original form of the ranked data is that low numbers mean high values of the interest or appeal, and vice versa. All coefficients will be stated here so as to show the true *meaning* of the correlation.

Nearly all the correlations between corresponding slips are positive and sufficiently high so that we may consider them provisionally as representative of the same general appeal. The only negative correlation is that between "Economical" and "Bargain."

The corresponding slips were combined so as to make 24 appeals instead of 48. These will be designated by the number

of the slips involved: thus (Adv. 1+2), (Adv. 5+6), etc. Then by the method of percentage of unlike signs, the intercorrelations between these 24 appeals were estimated. They are given in Table 4. These coefficients tell us what appeals are relatively associated with each other—tend to be evaluated alike, and what appeals are relatively opposite. Where the coefficients are numerically high, we may say in general that if an individual in this or a similar group reacts favorably to a certain appeal, he will probably react favorably (or unfavorably) to a certain other appeal. These figures also serve to test the a priori theories that certain appeals would be closely related because they seemed to arouse the same general emotional tendencies, etc.

In interpreting correlations between these *ranked* data, such as the advertisements, and the interests in studies, it must be borne in mind that we are dealing with *relative* and not absolute interest values. Since the values are expressed in ranks, there *must be* negative correlations, although no negative correlations might exist between the absolute values of the interest. Moreover, the smaller the number of the ranked items, the more must the negative correlations predominate over the positive ones. If we had only two items, the correlation between their ranks must necessarily be -1.00 . If we had only three, their average intercorrelation would be necessarily some rather high negative value, which could be determined if desired, by statistical formulæ. Hence, with all this material, it is the *order* of the correlation coefficients and not their actual values, which is chiefly significant.

The most conspicuous correlations are those between the advs. (1+2), (3+4), (5+6) and (7+8). These were all designed as appeals to different aspects of the self-assertive or mastering instinct, and they prove to be so well correlated that we have combined them into one large composite which we shall henceforth treat as one variable, calling it the "mastery composite." The Pearson coefficient between advs. (1+2+3+4) and (5+6+7+8) was computed in the regular manner and found to be $+ .61$. It would seem then that the tendency to react favorably to appeals of this general nature is a fairly well defined thing. Whether it bears any relation to actual strength of the self-assertive behavior tendency is a different question.

The two kindness appeals (43+44) and (45+46) are found to be correlated and are combined to form a "kindliness composite." The advs. 9 to 18, inclusive, were designed as appeals to the tendencies called social instincts, including sensitiveness to social approval and to convention and fashion.

But there is little consistency in their correlations and they cannot be combined into a meaningful composite.

Advs. (19+20) and (21+22) correlate +.44 (percentage of unlike signed pairs) and also show great similarity in their correlations with other appeals. They may be combined to form a variable representing a "quality of material" interest. It is to be noted that this is opposed to the mastery composite and slightly opposed to the kindness composite. This variable correlates positively with the following:

	(19+20)	(21+22)
with (17+18) (conservative + normality).....	+.27	+.19
with (23+24) (time saved + expeditious).....	+.15	+.41
with (27+28) (scientific and standard).....	+.15	+.48
with (29+30) (ingenuity + inventive genius)....	+.06	+.17
with (31+32) (mechanical accuracy + control)...	+.39	+.25
with (37+38) (purity + cleanliness).....	+.39	+.25

On the other hand, the mastery composite correlates negatively with all these variables, except (17+18). Leaving this one aside, it will be observed that the other five, together with (19+20) and (21+22), refer to advantages of a relatively objective and mechanical kind—they direct attention to the commodity itself and its characteristics.

Now there are two ways of classifying traits or appeals or tests or other variables. One is the a priori common-sense way of putting together those which seem descriptively similar; and the other is to put together only those variables that show positive correlation, when statistically investigated. The a priori classification of these appeals was according to the instincts—mastery, social instincts, kindness, manipulation-constructiveness. The correlations throw a somewhat different light on the classification. The advs. fall into two opposing major groups, as described above. The central element of the one group seems from inspection of the copy of the advertisements to be a kind of emotional, sentimental, self-reference. The other group seems to center about a relatively unemotional objective interest in the characteristics of the commodity itself.

Now we selected 8 appeals which best represented the first group and 8 appeals which best represented the second, combined them to form two composite variables, and subtracted the second from the first, thus forming a differential variable designed to measure the "relative strength of the objective, thing-quality interest, as compared to the response to appeals of a sentimental, subjective or self-referring nature." We labelled this variable for convenience "objve." The appeals to make up these two groups were selected primarily on the basis of

their correlations, but secondarily, their descriptive content was also considered. Everything put into the sentimental group had a positive correlation with the mastery composite, except (43+44) which it was not desired to separate from (45+46). (39+40) was put into the objective group because it of all the remaining appeals had the highest average correlation with the 5 already admitted to membership in this group. The variable "objve" then was composed of advs. (1+2+3+4+5+6+7+8+15+16+17+18+43+44+45+46) - (19+20+21+22+23+24+27+28+29+30+31+32+37+38+39+40.)

Calling the favorable response to objective appeals its plus pole, the variable "objve" gives the following correlations. These correlations are computed by the formula given by Yule for finding the correlation from a two-by-twofold table.

$$\text{it is } R = \frac{N\delta}{\sqrt{(A)(a)(B)(\beta)}} \quad 75, \text{ p. 217.}$$

This is found in practice to give values numerically lower than the percentage of unlike signed pairs method using Thorndike's table, and usually higher values with this kind of data than the regular Pearson formula. It is suggested elsewhere in this paper that either of these methods may for variables like those derived from the advertisement tests, have more meaning than the full Pearson computation.

with cheerfulness.....	-.32	general intelligence	
enthusiasm	-.21	(Pr1)	+.05
gregariousness	-.16	general intelligence	
perseverance (J13)	-.16	(JX)	+.08
aggressiveness (J1)	-.13	aggressiveness (Pr2)	+.08
desire for admiration	-.13	bodily activity.....	+.08
kindness	-.11	mental activity.....	+.08
perseverance (Pr7)	+.03	self confidence (Pr	
handsomeness	+.05	6)	+.11
personal appearance		intellectual interest..	+.16
(J16)	+.05		

While none of these correlations individually is high enough to be significant, except perhaps the first, the *order* in which they fall, and the differentiation between traits which correlate together very high, do appear significant. The "deeper" emotional traits of the social group, as distinguished from those of objective interests and activity and the objective aspects of the same group of traits, are the ones which most correlate with the responses to the subjective-sentimental appeals. There is then a definite correlation between emotional behavior as judged by fellows and the tendency to react positively to appeals verbally symbolic of the normal stimuli to emotional behavior. If we could find a method of measuring

such relationships which would discover and evaluate the factors which neutralize the correlation, we should have something very significant.

No correlation could be found between this "objve" and per cent of play time in childhood spent alone, nor with the degree of self-reference or interpretation in terms of self of the answer to question 13 of the questionnaire, nor with fondness for reading fiction, nor with interest rank of the studies psychology and literature. One result does, however, add a little argument in favor of considering this "objve" as related to something basic and important. In the answer to question 8 concerning vocational choice and motives, 13 men out of the 73 who answered gave "service" to mankind, or its equivalent, as one of the motives for their choice. Of these 13, 10 men were minus in "objve," i. e., favored the sentimental appeals, the other 3 being plus. Of the 13 who mentioned "service," 9 gave it as the first and foremost motive of choice, and of these 9 only one was plus in "objve." The average "objectivity" value for the 13 men was $-40.4p$, while the average of the whole group of 73 was $+03.7$. Standard deviation of the whole group 67.4p, of the service men 71p. P. E. of the average for the 13 service men is 12.6p. Hence they deviate from the group average by $3\frac{1}{2}$ times their probable error, and from the mean of the 60 non-service men by over 4 times their probable error.

Other correlations of the advertisements with the traits:

	zero	fourfold table formula	Pearson
J1 and advs (1+2+3+4)	zero		
J1 and advs (1+2+3+4+5+6+7+8) (‘mastery comp’.)			+ .08
J4 and advs (43+44+45+46)	zero		
J5 and advs (9+10+11+12)			-.20
J16 and advs (11+12)			-.24
Pop. and advs (11+12)			-.35
J18 and advs (33+34)	zero		
J10 and mastery composite			+ .24
J9 and mastery composite			+ .19

Thus, although the mastery composite does not correlate appreciably with aggressive behavior, it does correlate somewhat with emotional behavior traits. The tendency to respond favorably to "stylish" and "nobby" is negatively correlated with actual neatness of dress, and estimated desire for popularity. This seems to be due to a conventional distaste stronger among the more social groups. Kindness fails to correlate with the kindness composite.

An inspection of several correlation graphs between traits and advertisements reveals a definite trend of the mass of

cases in the direction of the expected correlation, but with smaller isolated groups of points widely separated from this trend which tend to neutralize or reverse the correlation. The correlation between enthusiasm and the "mastery" advertisements illustrates this. If it were not for the outlying groups of points in the first and third quadrants, there would be considerable correlation between these variables. This is further illustrated by the fact that often fairly high correlations are found by the unlike signs table or the fourfold table formula, but the regular Pearson computation makes these coefficients much lower—even to zero. This is because the few cases in the minus quadrants (or plus, as the case may be) of the graph are relatively distant from the origin, and hence their weight in the product sum balances the weight of the majority of cases in the other quadrants. For variables of this kind the correlation computed from the fourfold association table would seem to have more meaning than the full Pearson computation, for the former gives no credit for degree of deviations from the mean, but only their number and direction.

The interpretation is suggested that there is a real and high correlation between enthusiasm and the tendency to respond favorably to such appeals, but that this is nearly neutralized by two groups of cases: (1) those lacking in the trait who as compensation for their lack or from some other cause, have developed an "unnatural," so to speak, favorable response to the appeals; and (2) those who, high in the trait, have through unpleasant association or a conventional distaste or contempt, repudiated the appeals to which they "naturally" would respond. In general, we may be very skeptical about inferring from an individual's responses to words his responses to actual situations. This is the afferent or stimulus aspect of what is popularly termed "bluff."

QUESTIONNAIRE DATA

6. *Personal History. Age.* Average of the seniors on November 15, 1916, when the investigation began, was 21.84 years. It was thought that age might have something to do with the character traits, especially with aggressiveness. This was tested, and there was found to be no correlation between age and aggressiveness. The extreme range of the ages was from 20 to 24½ years.

Parental occupation. It was thought possible likewise that the social and financial position of a man's family might have some influence on his ability to attain popularity, and hence

be judged aggressive, etc. This was roughly tested as follows:

Average popularity score of the 12 men whose fathers had such occupations as farmer, laborer, carpenter, clerk, mechanic, 300p. Of 8 men whose fathers were lawyers, physicians, dentists, and large business executives, 285p. P. E. of the latter average, about 19 points. The difference is hence less than the probable error. Again, this comparison:

	Agressiveness. (J1)	Intelligence (Pr1)
Mean of whole class.....	293p	338p
Mean of 16 sons of professional men.	307p	385p
P. E. of latter mean.....	12p	14p
Standard deviation of whole group...	70p	75p

Thus the sons of professional men are above the group average by about $3\frac{1}{2}$ times their probable error in intelligence estimated by their instructors, but in aggressiveness the difference is not significant.

A brief inspection of the occupations of parents shows that these is no factor of wealth distinction that would have any influence here. The spirit of the institution is such as would make a man's prestige mainly dependent upon his appearance, behavior and ability.

Employment (Questions 4 and 5). There is no significant correlation between amount of employment in college and popularity or aggressiveness. The half of the men who have done the most toward working their way through college exceed the other half in both popularity and aggressiveness, but by only the amount of the probable error. The 27 men who mention the more unskilled and undesirable jobs as part of their employment while in college exceed the rest of the men in popularity by nearly twice the probable error; 56 out of the 76 men have had some employment while in college, outside of summer work. This includes all kinds of work from tending furnaces to tutoring or running Sunday schools. There is no correlation between popularity and total amount of employment and home duties before and during the college course.

Early environment (question 2). Figures are given in class intervals as units.

	No. of men	Aggressiveness	P. E.	Popularity	P. E.
Farm	10	-1.50	.60	-.80	.66
Town or village under 8,000	22	+.73	.40	+1.63	.44
City 8,000 to 100,000.....	23	-1.30	.41	-1.13	.43
City over 100,000.....	21	+.38	.41	-.09	.45

Most notable here is the superiority of the men from the smaller towns over those from small cities, amounting to 5 and 6 times the probable error.

Degree of companionship in play. (Question 6.) The percentage of time estimated to have been spent alone, with chums, or with gangs, when a boy, have no direct relation to present estimates of behavior. The nearest to a significant correlation is $+0.15$, Pearson computed, between popularity and the variable 'per cent of time spent in gangs minus per cent of time spent alone.'

7. *Interests.* Question 10 gives us the ranking of 9 types of studies in their interest values for each individual. The 3 men who failed to answer were assigned the rank 5 in all studies, this being the mean value of all the data. Each study then becomes a variable which can have 9 possible values, the integers from 1 to 9. The means and standard deviations of the 9 study-interests are given below. Remember that here as with the advertisements, a low number means a high interest value, and vice versa.

	Mean.	Standard deviation.	Rank for group.
A. Mathematics	4.64	2.66	2
B. Languages	5.45	2.48	8
C. Literature	4.94	2.18	6
D. History	4.39	2.12	1
E. Physical, mechanical sciences.	4.89	2.67	5
F. Chemical sciences	4.69	2.58	3
G. Biological sciences	5.24	2.81	7
H. Psychological sciences, philosophy, etc.	5.97	2.64	9
I. Economics, politics, etc.	4.76	2.27	4

The correlations between these 9 study variables, estimated from the percentage of unlike signs, are given in the following table. The figures in the lower parts of the squares are the true Pearson coefficients computed in the regular manner, where such computation has been made. Evidently the unlike sign method here also gives coefficients usually too high.

A study of these correlations shows what would be expected, an association of the natural sciences on the one hand, and at the opposite pole, the studies history and literature. It must be remembered that these variables are like the advertisements not absolute, but relative interest values, as is necessarily the case where ranks are used. Hence there *must* be negative correlations and since we have only 9 items, the most probable correlation between any two is not zero, but somewhat less. Justified by their correlations, we now combine the 3 variables E, F, G, and get a composite variable that we call "relative interest in the natural sciences" (studies $E+F+G$). Likewise we combine C+D. Then these two composites were subtracted to get the differential variable ($E+F+G-C-D$)—"interest in the natural sciences minus interest in the humanities." In making this combination the variable (C+D) was first multiplied by 1.60 so as to make its mean and standard

TABLE 5
INTERCORRELATIONS OF INTERESTS IN STUDIES

	A	B	C	D	E	F	G	H	I
Math. A. ....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lang. B.	-.40 -.27	.....	.....	.....	.....	.....	.....	.....	.....
Lit. C.	-.24	+.28	.....	.....	.....	.....	.....	.....	.....
Hist. D.	-.40 -.24	-.12 +.03	+.40 +.26	.....	.....	.....	.....	.....	.....
Phys. E.	+.58	-.40	-.55	-.50	.....	.....	.....	.....	.....
Chem. F.	+.32	-.50	-.73	-.50	+.58 +.39	.....	.....	.....	.....
Biol. G.	-.08	-.20	-.61	-.48	+.04 -.05	+.61 +.41	.....	.....	.....
Psych. H.	-.48	-.12	+.08 +.14	0	-.44	-.48	-.24	.....	.....
Econ. I.	-.39	-.08	+.12 +.03	+.20	-.32	-.44	-.51	+.28 +.38	.....

In ordinary type = method of unlike signs.
In bold face type = regular Pearsons.

deviation approximately equal to those of (E+F+G), in order that both factors might have equal weight in the composite.

There is no correlation between the number of the advertisements actually disliked and the number of studies disliked.

Recreative activities. Question 9 enumerates most all the important types of recreative activities common to young men. It is purposely made comprehensive; most any other activities that could be mentioned could be brought under this classification. These activities are evaluated as to interest not by ranking, but by the use of one of the 4 possible marks as indicated in the instructions. The variables are hence absolute rather than relative interests. In making up the variables, the marks were evaluated thus:

— 0 points; + 1 point; + + 2 points; + + + 3 points.
For the present study, the separate items were not intercorre-

lated, but on the ordinary descriptive criterion alone were added up to form 5 more generic variables, as follows:

Activities column 1: competitive athletic sports, 6 items: baseball + football + basketball + tennis + boxing + wrestling.

Act. col. 2: less competitive, more individualistic sports, 8 items; swimming + rowing + canoeing + bicycling + track and running games + jumping and vaulting + gymnasium work + skating.

Act. col. 5: aggressive-social activities, 3 items: public speaking or debate + running or directing social and business affairs, meetings, etc., + business contact and interviews with men.

Act. col. 6: non-aggressive social activities, 3 items: taking part in amateur dramatics or entertainment + attending club, fraternity, or class meeting, smoker, etc. + meeting strangers.

Act. col. 7: manipulative-experimental activities, 3 items: building or making something + experimenting with mechanical or electrical apparatus + experimenting in chemistry or biology.

This classification is of course open to objection: it is simply a provisional grouping of activities according to the instinctive behavior roots, just as the traits and advertisements were grouped.

The following correlations were found:

(1) between the activities themselves.

Competitive sports and less competitive sports $R=+.41$ (Pearson.)

Aggressive and non-aggressive social activities $+.46$ (Pearson.)

This justifies our combining the variables to form these new compounds:

Act. col. (1+2), "total athletic sports."

Act. col. (5+6), "total social activities."

Now we find the correlations:

Total sports and total social activities, estimated $R=0$.

Total sports and manipulative activities, estimated $R=\text{very low } +$.

These data seem therefore to be reliable and consistent: like groups of interests correlate with each other, and unlike groups, in absolute values, are independent of each other. As we should rather expect, if a man were fond of certain social activities, he would likely to be fond also of other activities involving many of the same elements of stimulation, but we should have no clue as to his fondness for athletics or constructive activities.

(2) Correlations with other variables. "Total sports" interest has no significant correlations with the qualities aggressiveness, enthusiasm, mental activity, perseverance, intelligence, or even with bodily activity and athletic achievement. Neither part of the sports composite has any relation to ag-

gressiveness. "Subjective" fondness for sports and exercise evidently has no relation to the tendency actually to engage in them under the college organizations and to succeed in them.

"Total social activities" has a computed Pearson correlation with aggressiveness of $+0.36$. This shows that the subject's report of his own interests and dislikes is not an arbitrary meaningless thing. This variable has a correlation with desire for admiration of $+0.40$ (Pearson). Its correlation with objective popularity score, computed, is only $+0.16$ (Pearson). Thus fondness for social recreations is more related to aggressive, popularity-desiring behavior than to the actual prestige obtained.

Act. col. 7, or fondness for manipulative-constructive recreations, has the following correlations:

With professors' estimate of manipulative constructive interest, trait Pr3 (obtained for the 46 technical men only), $R = +0.45$ (computed Pearson), P. E. $= \pm 0.08$.

With studies (E+F+G), "interest in the natural sciences," $R = +0.53$ (Pearson). With advs (19+20+21+22+27+28+29+30+31+32), the quality-of-material-technical appeals, $R = +0.16$.

We now make up another differential variable by subtraction of act. col. 7 from act. col. 6, i. e., "fondness for social recreations as compared with fondness for manipulative-experimental-constructive activities." In doing this, the two component variables are first put in terms of their respective standard deviations, so that the two parts may have equal weight in the result. Now this differential is correlated with the differential variable described under study interests, "interest in the natural sciences as compared with interest in history and literature." The Pearson coefficient, regularly computed is $+0.53$, giving the sign according to the true meaning of the correlation. Now we have two variables, correlated $+0.53$ with each other, one derived from study interests, and the other from recreations, which seem to measure a common factor "interest in human relationships and character as compared with interest in things and their mechanisms." This is the trait which Prof. Thorndike mentions as a rather important variable of human nature, being for one thing one of the chief directions of greatest variation of men from women. (60, vol. 3, p. 201.) If we now combine these two, by reducing each to multiples of its own standard deviation and adding, the resulting variable will be the best measurement we can make of this trait with the data in hand. This we shall designate for brevity "(hum.-mech.)"—"human minus mechanical interest."

This (hum.-mech.) has the following correlations:

With aggressiveness (J1), $+.24$ (computed Pearson.)

With desire for admiration, $+.25$ (computed Pearson.)

With kindness and gregariousness, low positive correlations are estimated.

With most of the other traits, and with popularity, the correlations estimated by percentage of unlike signs are zero.

With the advertisements of the quality-of-material-objective group, and with this compound as a whole, the correlations are very low negative, the only significant one being with (31+32), which by unlike sign method is $-.40$.

It is rather significant that the tendency to be interested in human rather than mechanical affairs is slightly correlated with aggressive and social behavior as judged by fellows. If it were legitimate to correct the above coefficients for attenuation due to assumed errors in the measurement of (hum.-mech.), the correlation would be raised to $+.30$. This is suggestive of Veblen's classification of humanity in his "Theory of the Leisure Class" (66, 67), in which the dominating, predatory, exploiting character on the one hand is opposed to the mechanical-minded workmanship character on the other. Before taking this too seriously, however, we should like to see this correlation computed in other kinds of groups. If any such correlation were found to be true in high degree in the universe of the whole population of a country, we should still have to inquire whether it was due to original nature, or to early experience of a relatively individual and independent kind, or to the culture and traditions of different social and occupational groups.

This (hum.-mech.), however, it may seem to resemble the variable "objve" derived from the advertisements, is a very different thing, as its correlation with the latter is practically zero.

The answers to question 7 were evaluated simply by judging them as wholes, giving them 4 possible grades: 0 for complete denial of any mechanical or constructive activities in childhood, 1 for some such, 2 for much, 3 for very much, as well as could be inferred from the answers. This degree of childhood mech.-constr. interest correlates with:

Act. col. 7, present manipulative-experimental activity interests, $+.40$.

With studies (E+F+G), the natural sciences, $+.06$.

Both coefficients Pearson computed.

Thus the childhood activities bear some relation to the present fondness for the same general kinds of activity, but very little to present interest in science in general.

III.

GENERAL DISCUSSION IN RELATION TO OTHER WORK IN THIS FIELD

The general orientation for classifying behavior traits was derived in this study from Thorndike (60, Vol. 1) and McDougall (40), especially the former. Dr. Thorndike's seems to be by far the best description and classification of the original tendencies; and it is especially desirable because phrased in terms of behavior. From the physiological work of Cannon (8, 9), Crile (13, 76), and the Freudian psychology as interpreted by Trotter (64, 65), we seem to have a very good basis for classifying all the original tendencies in the four great instinct groups of nutrition, reproduction, self-defense and herd-instinct. To this perhaps a fifth group might be added, including many subsidiary instincts such as curiosity, vocalization, manipulation, whose function is a more indirect and long-range adaptation. The present study fails to give satisfactory evidence either for or against using as basic variables for differential psychology the several instincts, or the four great instinct groups.

Wells gives a particularly good classification of character variables, which unlike many others is dynamic and is devised with regard for the balancing and compensating mechanisms of character. It is especially significant because it suggests how functional data such as the Freudian method gives can be translated into statistical variables for correlation (71).

Schneider's list of traits for classifying men and jobs is very significant in that it shows a tendency to classify in terms of *stimuli*, instead of simply enumerating vague "qualities." Thus several of his items answer the question: How does the individual react to certain very frequent stimuli which are common elements of many situations of daily life and occupation? (49.) A man's efficiency in his vocation may depend very largely upon these conditioned reflexes that he has formed to certain stimuli. Take the case of one who is made ill by riding on trains, or one who is always angered by criticism, though not a pugnacious person in general, or one who cannot endure staying indoors. This inadaptability to indoor work may not best be interpreted as due to some general quality of restlessness, or adventurousness, or lack of concentration, or whatnot, but as a reaction to the specific situation "indoors," brought about by a past association of this stimulus with unfavorable or annoying conditions. Hence if we could draw up a list of *situations* that are frequent and vocationally significant, such as "responsibility" vs. "carefree-

ness," "having to wait," "uncertainty," "being criticised by a superior," "routine," "outdoors," "disorder," "machinery in general," etc., and catalog the individual's reactions to these, we should have a better record of his character than a list of reactions in general. It would be still better to specify each stimulus more in detail for each individual, because, for example, a man may react favorably to some kinds of routine but not to others.

It has been also a favorite activity in this field to classify men into types on some anatomical basis and then to assert that various mental characteristics are associated with or indicated by the anatomical characteristics. Some of these attempts have been the grossest charlatanism; in other cases there is plausible scientific evidence, on a priori grounds, to expect the alleged correlations. But nearly all such attempts, even those made by scientific men, fall down because they fail to demonstrate statistically that the correlations actually exist.

Thus, Lewis (39) has summarized excellently much recent medical literature by Bryant (7), Goldthwait, and others, on the so-called carnivorous and herbivorous types in man. From the descriptions of the types we gather that the chief variable—the central differentiating factor between the types, is bodily fulness, or, in statistical terms, height-weight index. In fact, some of the writers would substitute the words "heavy" and "slender" for "herbivorous" and "carnivorous." That certain diseases and bodily characteristics are associated with the heavy type, and others with the slender, we will not at present question, although we should like to see their medical evidence presented more in statistical form—in correlation coefficients.

But when statements like the following appear, the patience of the statistical psychologist is at an end. Thus, Bryant says:

"The carnivore is the restless pioneer, inductive, dying ever on the outskirts in search of something new. . . .

"The herbivore is the sedentary stabilizer, deductive, ever at his appointed task."

The editor of the Boston Medical and Surgical Journal, in discussion of this, says:

"Racially the carnivorous type is more active, energetic, and dominant; the herbivorous type is more stable, artistic, contemplative. . . . The herbivorous type tends to survive by virtue of its stability, the carnivorous by its superior energy and versatility." (39, p. 302.)

Now the present study fails to show any significant correlation between weight-height index and the traits aggressiveness or perseverance, nor with any of the traits. With ag-

gressiveness, which certainly measures or correlates very high with the mental characteristics just ascribed to the carnivorous type, the correlation by the method of unlike signs is $+.09$, which is in the wrong direction if thought suggestive even. With perseverance the correlation by unlike signs is $+.18$. A differential variable of aggressiveness minus perseverance was made up: this measures the degree to which each man's aggressiveness, in terms of its standard deviation, exceeds his perseverance in like terms. The graph of the correlation of this variable with weight-height index shows not the slightest sign of more than strict neutrality.

The research most nearly comparable with this is Webb's study on English college students and schoolboys (70). Webb's correlations differ from mine in being in general lower. He has many negative coefficients. This is probably due to his using more traits and more specific traits, and to his having judges who trained for the task by observing their subjects closely. He had only two judges to each subject, and 20 subjects for each judge. The reliability coefficients averaged about $.50$, not varying greatly from trait to trait. He had 48 variables, of which 46 were judgments. His correlations in general agree roughly with mine. Among the chief specific differences are that in his study kindness is more highly correlated with the perseverance and intelligence traits, and that there is a much wider opposition between these latter and the "lighter social qualities," as he calls them.

By Spearman's criterion that the correlations of correlations should be $+1.00$, Webb finds two "general factors;" one the "general intellective energy" of Spearman; the other, of which he is the original discoverer by statistical methods, is something related to persistence, or will, or consistent reaction. He finds his clue to this in notable differences between the correlations of quick intelligence and those of profound intelligence. With the former are related more highly the traits (a) readiness to anger, eagerness for admiration, and bodily activity in pursuit of pleasure. With the latter go relatively more: (b) perseverance traits, kindness on principle, trustworthiness, conscientiousness. Now the groups (a) and (b) both satisfy Spearman's criterion within themselves, and each gives correlations of correlations of -1.00 approximately with the other. He concludes that these groups of traits represent the opposite directions of some fundamental general factor "w," "that a second factor, of wide generality, exists, and that this factor is prominent on the 'character' side of mental activity (as distinguished from the purely intellective side)" (70, p. 58). He relates this

"w" to the perseveration tendency of Muller and Pilzecker (43), the secondary function of Heymans and Wiersma (28), the secondary function of Gross (25), the interference of Culler (14), the will of Ach (1), and to various observations of character differences by Meumann and Partridge (47).

Lankes (37) has tested this perseveration hypothesis, and although he found a correlation of $+.86$ between tests of perseveration and a weighted interrogatory concerning phenomena of personal experience (such as feeling the motion of a boat for a time afterward) supposed to be indications of this tendency, on the other hand estimates of persistence qualities of character correlated negatively with the tests and the interrogatory!

What general factors shall be found in this way may depend largely upon the purpose and interests of the investigator and the list of traits used. It is possible that Webb could have found other general factors in his traits, and it is also likely that the "w" he found might better be interpreted in another way. It might for example be a differential variable of the still more fundamental factor of energy-emotionality in general minus a learned factor of morality and repression. We are at least impressed by the general moral coloring which pervades this persistence group of traits—it includes religious interest, pure mindedness, while the (a) group includes anger, superciliousness, etc.

In regard to "general factors," the following possibility, though speculative, must be borne in mind. In all judgments of human behavior, the subjects judged are in a particular environment and known to the judges in selective respects only. No judge and no list of traits covers exhaustively all the characteristics of behavior. Every environment tends to make conspicuous individual differences in certain respects but to conceal differences in others. Thus my study made the two axes of greatest variation, so to speak, the social traits on one hand, and the intellectual on the other. These might be not as fundamental as supposed, but simply the two variables which the college environment and traditions select as most important and emphasize in the minds of observers. In a business office, differences in general *efficiency* would loom up large and obscure many differences noticed in college life. Furthermore, the environment and resulting selection of conspicuous differences determine to some extent what traits can be used for judging, and the interpretation the judges will put upon the traits that are used. The only way to get an unselected list of traits would be to gather them equally from all the original tendencies, as described for example by Thorndike.

A careful study of the correlations such as Webb made and I have made to some extent, may get beneath what seem superficially to be the important factors, and reveal such more basic factors as his "persistence" and my general emotionality and energy, but we cannot be sure that even these are free from the bias discussed above. Possibly they come close to designating the really basic factors, but are each colored somewhat by the point of view and environment of the research.

As Prof. Hollingworth says, it is difficult to say how far all such systems of intercorrelations of judged traits "measure definite relations between different and specific traits, how far they measure the degree to which one's impressions of various traits conspire to make up one's notion of other characteristics, or how far they measure only the degree of confusion that exists as to the precise meaning of the various words." (30, p. 171.) To this may be answered, of course, that such is all we expect: that a trait is nothing more nor less than its estimates say it to be—that they in fact are its definition. But this answer only transfers our ignorance from the reliability of judgments back to the nature of the traits themselves, and makes them subjective impressions rather than objectively definable behavior characteristics. In short, intercorrelations of judged traits alone can never solve the problems of character. The hope lies in correlating these traits with data from other sources, and especially with anatomical and physiological characteristics. This study has aimed to suggest how this might be done.

This suggestion comes from my own study and from many others in this field; in regard to the traits or variables that should be used in measuring human nature. The most fundamental and significant variables will probably be neither the conventional list of adjectives, nor yet a list of the relative strengths of the several instincts, which Moore and I have been in a way trying to measure. They will rather be variables of the two following kinds: (a) Certain innate, "temperamental" variables that underlie and influence all instincts, and which are related to anatomical and physiological differences and may in time have correlations therewith demonstrated, such as bodily energy, general sthenic emotionality, tendency to be phlegmatic. In this category might, however, be admitted such variables as "strength of self-preservative tendencies in general" or "sex," etc. (b) Certain *acquired general factors*—general because they are reactions to stimuli which are *common elements* to a great many situations in life—cultural variables, such as for example, "morality," in large

part; "mechanical interests," etc. These variables refer to *stimuli* rather than the responses—are in McDougall's class of "sentiments." Many of them, however, may be related in some obscure way to innate differences of class (a).

It would seem that in the variable "objve" we have something of interest. There arises a strong temptation to try to identify this or relate it in some way to that striking character distinction which seems to appear in James' "tough-" and "tender-minded" types (32), Ostwald's romantic and classic types (46), Jung's extraversion and introversion (77), and in other literature (referred to in 77).

But supreme caution must here be observed. "Objve" seems to represent a tendency to matter-of-fact interests as opposed to love of introspection. If we could find a correlation between this love of introspection and Jung's introversion, or dementia praecox or paranoiac tendencies, we should be on the road to something very significant. But until we can demonstrate such a correlation, we have no right to say "objve" is anything fundamental. It may be a very superficial variable which appears here simply because it is the thing which these advertisement tests are best adapted to test.

In fact it is not at all clear that the distinctions made by Jung, James, Ostwald, and others, are the same thing, in spite of their remarkable similarity though coming from independent sources. If they are identical, however, we still must investigate the possibility that the distinction so celebrated is essentially a distinction in the world of *stimuli* or objects rather than in the nervous system or temperament. This offers a most important field for research.

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BOOK REVIEW

La Grande Guerre. Catalogue raisonné des estampes, originaux, affiches illustrées, imageries, vignettes, cartes postales, médailles, bons de monnaies, timbres, etc., du 1er Août 1914 au 31 Décembre, 1915. Préface de GEORGES CAIN. Tome premier. Collection HENRI LEBLANC. Destiné à l'Etat. Paris, Emile-Paul Frères, 1916. 434 p.

This collection of material relating to the war was begun in the first days of August, 1914, by Mr. and Mrs. Leblanc in a very small way by laying aside the newspapers and periodicals that might prove of interest to their friends when they returned from the front. They found that their task was a far more important one as the weeks went by so they decided to broaden its scope and lay the foundations for a great national collection. They have now associated with them seven others who are assisting in the work and they announce that the second and third volumes are in preparation.

The volume before us is a detailed description or catalogue of the pictures, portraits, images, toys, programmes, calendars, posters, postal cards, stamps, and war money. Down to September 30, 1916, they had collected 25,051 separate items. There were 5,188 books and pamphlets; 396 periodicals; 936 pieces of music; 4,632 pictures; 522 original drawings; 202 illustrated posters; 4,012 postal cards; 511 correspondence cards; 1,908 cartoons from journals; 824 pieces of war money; 2,493 photographs, besides a large number of other items. Mr. and Mrs. Leblanc have devoted time and money most prodigally in their efforts to make the collection one worthy of acceptance by the nation. Monsieur Georges Cain in his introduction to the volume says that Madame Leblanc, whose special part of the work has been the collection of prints and pictures, has, by special permission of the Minister of War, made periodical trips to Switzerland to pick up German and Scandinavian material not otherwise permitted to enter France. Monsieur Leblanc is preparing the catalogue of printed books and pamphlets which will appear in a later volume.

If any nation should have a complete Museum and Library of the Great War it is France, and we hope the publication of these volumes may bring to the Leblancs many missing items. Their collection of the English Recruiting Posters is very incomplete as we notice but 50 of the 150 or more that were printed. We bespeak for them the cooperation of those who may have duplicates, or material they may be willing to give to the French National Collection.

This collection is probably only one of the many that will be made in different countries. Nearly two years ago rumors reached us of the activities of certain German libraries in the collection of literature on the war; we were even told of the number of tons of newspapers that were turned over to them each week and of their training large numbers of women and girls to arrange and catalogue them. Again, we were told that librarians were sent out with the German armies to care for and preserve all the literature in the conquered territory. How much truth there is in this will only be known when peace is restored.

Lange and Berry's Books on the Great War had reached its fourth volume in July, 1916, volume 4 containing over 2,500 titles. These will

some day be cumulated into a single volume and will be of inestimable service. Recently Mr. Alexander J. Philip, Librarian at Gravesend, England, has announced his intention to issue a full bibliography of books and pictures on the war in card form. He expects to issue from 2,000 to 3,000 cards a month at a cost of two and a half cents a card. The London *Times* of February 15, 1917, says of it:

"In addition to books and pamphlets, posters, handbills, circular letters of the Army, the Navy, and announcements relating to war savings, national economy, etc., will be included, as well as cinema films, and the many bills, leaflets, and circulars issued or published by local authorities, societies and private persons. Much of this literature is already lost for good, unless stray copies remain in forgotten drawers in private houses. Even the records of these fugitive pieces, other than in the International Bibliography of War, are in danger of disappearing. A full catalogue will do everything required by the student of history and sociology. Only seven sets of the card catalogue are to be made and one set only will be deposited in any country. The catalogue, alphabetically arranged, will give all information under the author, the title, and the subject. The work entails a world-wide organization with correspondents in all countries collecting records in all languages."

The Library of Congress may also issue its own Bibliography of the War, and the New York Public Library might render a great service by reissuing, at some later date, a cumulated list of its books on the European War, which has covered from six to twelve pages of each issue of its Monthly Bulletin since February, 1915. Perhaps we may yet have a union list of all the war material in the larger libraries of the United States and thus avoid an enormous amount of duplicate printings.

LOUIS N. WILSON.

BOOK NOTES

Science and learning in France; with a survey of opportunities for American students in French Universities. An appreciation by American Scholars. Society for American Fellowships in French Universities, 1917. 454 p.

This is a coöperative volume designed to show Americans the contributions of France in all branches of scientific knowledge, and to show her status in the forefront of the world's progress, and especially to give American students information as to graduate work in France. Each chapter (and there are over a score of them, some with various sub-divisions) takes up a particular topic, beginning with anthropology, archaeology, astronomy, etc., and gives briefly its history and prospects. President Charles W. Eliot and Dr. George E. Hale write introductions, and then follow the contributions of some two-score authors, with a long list of some thirty double-column pages of sponsors. It is designed to be a token of national homage on the part of America to France. While most heartily commending the purpose of such a work, it must be admitted that the chapters on the different topics are not, as a whole, very luminous. Some of them particularly are very perfunctory, superficial, ill-informed, and do scant justice to their subject. A great deal of the space of most is devoted to the great men of the past, and in the present writer's estimation too little attention is given to the actual present-day opportunities. It is doubtful whether this book would really contribute much in the way of either informing or inclining young graduates to go to France.

English literature. By EDWIN L. MILLER. Philadelphia, J. B. Lippincott Co. (c. 1917), 597 p.

The author has read books all his life, not with the desire to improve his mind, being satisfied with it as it is, but he has read in the spirit with which boys play ball, girls play dolls, men attend prize-fights, and women gossip; that is, he has read for fun. He has written this book to convey to young people "the secret of the location of the source of this perpetual fountain of refreshment." The quiz is a melancholy practice. He hopes his pages will be interesting to read, and in his nearly fifty chapters he begins with the Saxons, Normans, Chaucer, etc. has successive chapters on Spenser, Shakespeare, Bacon, Milton, Bunyan, Dryden, Swift, Addison, Pope, Johnson, Goldsmith, Burns, Wordsworth, Scott, Coleridge, Lamb, Byron, Shelley, Keats, Carlyle, Macaulay, Tennyson, Browning, Dickens, Thackeray, Ruskin, Stevenson, George Eliot, and last of all Kipling.

The authority has written an interesting book, which brings out the individuality of the writers, which are usually illustrated by picture.

Productive plant husbandry. By KARY CADMUS DAVIS. Philadelphia, J. B. Lippincott Co., (c. 1917). 462 p.

This book touches first the subject of plant-life and growth, and methods for improving plants. It holds that a preliminary study of botany is not essential. Then come soils, their improvement and maintenance, treatment of various farm crops, their enemies considered somewhat fully, and much emphasis is laid on the improvement of the home and the community. There are field and laboratory exercises,

at the close of each chapter, and the work is designed for the more than forty-six hundred high schools now giving courses in agriculture. The book had its origin in the discussions formulated by agricultural teachers of these schools in their conferences since 1914. An effort is made to get away from the one-year plan, and also there is a feeling that students should not have to purchase too many separate texts for each year of the high-school course. The book is copiously illustrated with 312 cuts, and among its 32 chapters are those devoted to water and soils, drainage, rotation, corn, potatoes, cotton, sugar-cane, small fruits, tobacco, weeds, economic insects, etc.

The book of worship of the church school. By HUGH HARTSHORNE. New York, Charles Scribner's Sons, (c. 1915). 170 p.

An old wine in a new bottle. By N. O. RUGGLES. Boston, Gorham Press, (c. 1917). 50 p.

Manual for training in worship. By HUGH HARTSHORNE. New York, Charles Scribner's Sons, (c. 1915). 154 p.

School efficiency; a manual of modern school management. By HENRY EASTMAN BENNETT. Boston, Ginn and Co., (c. 1917). 374 p.

This work is a product of experience in school management and supervision and the teaching of these subjects. The first aim is to help teachers and the next, set higher ideals, and to overcome the gap between theory and practice; also to reconcile conflicting theories. Its thirty-one chapters treat school grounds, buildings, lighting, seats, apparatus, housekeeping, health, curriculum, organization, promotion, progress marking, reports to parents, schedules, home-study, right start, routine, eliminating waste, work and drudgery, marking exercises, motives and incentives, punishment, constructive government, community cooperation, extension, special days and occasions, teachers' rights, duties and self-management.

How we learn; a short primer of scientific method for boys. By W. H. S. JONES. Cambridge, University Press, 1916. 64 p.

This is intended for the use of pupils of about sixteen, who for some terms have been trained to work out exercises. It sums up what they have been learning, and contains the minimum of what every pupil of sixteen ought to know. The chapters are on "Words" and "Scientific Method." It seems to the writer of this note that such a work as this should never have been written, and is hardly less than preposterous. To turn the minds of young people, who are naturally very objective, inward upon the processes of thinking, perceiving, etc., can only tend to paralysis. There is nothing here that could interest them, and every vestige of interest must be a pure artifact. But if something of this sort is to be done, this is very far from the way to do it.

The science of human nature; a psychology for beginners. By WILLIAM HENRY PYLE. Boston, Silver, Burdett and Co., (c. 1917). 229 p.

To our thinking, it is rather presumptuous to call a book which deals only with the following topics: race and individual, mind and body, inherited tendencies, feeling and attention, habit, memory, thinking, individual differences, and applied psychology, "The Science of Human Nature." The book, to be sure, is broader than most textbooks on the subject, as befits a primer, but to conceive the whole matter of

individual differences as lying within the realm of these boresome tests that meet us everywhere to-day, is presumptuous.

A scale of performance tests. By RUDOLF PINTNER AND DONALD G. PATERSON. New York, D. Appleton and Co., 1917. 218 p.

This book is an attempt to contribute to the few scales already in general use another kind of scale for testing intelligence. The work grew out of the psychological examination of deaf children, for which purpose ordinary scales were useless. These, therefore, do not involve any kind of language response. Some of these tests have been standardized. The tests are fifteen in number and considerable space is devoted to their presentation. The year scale, median mental age, point scale, and percentile method, are given special chapters.

Rational sex ethics. By W. F. ROBIE. Boston, Richard G. Badger, (c. 1916). 356 p.

This book is based, on the whole, more upon the physician's personal experience than upon literature. The writer speaks with the utmost plainness, especially in his chapters on extracts from the popular teaching in sex matters, abstracts from case-book, analysis of sex instinct, marriage vs. free love, the psychology and physiology of sex involving the art of love. The concessions the author makes to autoerotism perhaps will seem to many the most salient feature of the book.

The children's library; a dynamic factor in education. By SOPHY H. POWELL. White Plains, N. Y., H. W. Wilson Co., 1917. 460 p.

This book is addressed to those interested in children, whether teachers, librarians, or parents. It does not present definite conclusions or technical information, but discusses such topics as the place of books in education, early libraries for children, elementary, high-school, country and public libraries, and relation to education, the children's room, the child librarian, aids to her work, book selection, social aspects of library work with children.

The psychology of religion. By GEORGE ALBERT COE. Chicago, University of Chicago Press, (c. 1916). 365 p.

This work is intended primarily as a handbook for beginners in the psychological analysis of religion. Hence its first purpose is to make clear the nature of the problems, kind of data, the methods and results. Such a thing is needed, because of the difficulty of analyzing religious experience and because of the difficulties due to the youth of the subject. The author tells us the religious enterprise is to him the most important undertaking in life, but he does not appeal to any of his own experiences as settling any of the questions of psychology but he is cautious with regard to the content of religious tradition, while his own experience has been as free from mysticism as it has from dogmatism. Fundamental to him are the rational possibility of faith in a personal God and life after death, for he conceives the ethical in social terms. He is averse to dogmatism in science or religion. Some of the most interesting of his nineteen chapters are, religion as an object of psychological study and the mental mechanisms, and psychology of persons, the data and how they are got, the analysis of the religious consciousness, racial beginnings, genesis of the God-idea, religion as group and as individual conduct, conversion, mental traits, the subconscious, the religious revaluation of values, religion as discovery, as social immediacy, mysticism, the future life as a psychological problem, prayer, the religious nature.

The religion of power. By HARRIS E. KIRK. New York, Hodder and Stoughton, (c. 1916). 317 p.

This book is the outcome of personal experience. When the author began to preach, eighteen years ago, he was content to proclaim only what he had been taught to believe. Then came the need of more intimate appropriation of truth, and he sought to gratify it in philosophy. But soon this was inadequate and he felt the need of a firmer hold on the influences that had stabilized the past, so that this book is a record of this fresh endeavor to interpret Christian experience for himself. It has been a power in his own life. Hence in Part I he treats of the quests for safe conduct, ritual, ethical and legal. In Part II, the religion of power, he treats Christianity, also as a justifying and constructive power. The last chapter treats of it as a finality.

Method in prayer; an exposition and exhortation. By W. GRAHAM SCROGGIE. New York, Hodder and Stoughton, (c. 1916). 172 p.

First the author discusses the practice of prayer. In the second chapter, under adoration, the idea of worship, its object, character and meaning. Under confession, he discusses its meaning, habit and fruits. Under petitions, their warrant, conditions of prevailing prayer, promises to those who pray, proper subjects for daily prayer, practical outcome of our requests. Intercession treats of its ministry, values and obligation, while thanksgiving discusses the ordinance, action, and object of praise. The last section is on the study of prayer.

Virgil C. Hart: missionary statesman. By E. I. HART. New York, Hodder and Stoughton, (c. 1917). 344 p.

This is a worthy biography of a great man, who has left his indelible mark upon the east. His two great missions testify to the comprehensive insights he had of China's needs and her potentialities, as well as his appreciation of the forces which would free her from her age-long stagnation and lift her into a new life and influence. He planned not only for pioneer work but for expansion and on these foundations which he laid the religion of the west has become a great influence in the east. His work, too, had great reflex influence in the west.

Handbook of the New Thought. By HORATIO W. DRESSER. New York, G. P. Putnam's Sons, 1917. 263 p.

This seems to be the fourteenth book of this fecund author. The foreword tells us the New Thought stands for the affirmative attitude. It affirms success even against failure, would compass the whole life, stands for the power of mind as over against environment, means the elimination of fear, depression, unbelief, is a gospel of health and healing, believes in the supremacy of good, etc. The chapters are on exposition, historical sketch, the silent method, estimate, mental theory of disease, reconstruction, practical suggestions.

The essentials of religious education. By CHARLES WILLIAM HEATHCOTE. Boston, Sherman, French and Co., 1916. 289 p.

The heart of humanity goes back to the Bible, which critics cannot kill. The chief topics here are, the scope of religious education, its history, principles of psychology, child development, early and late, the teacher's requisites, preparation and teaching, questions and illustrations, Bible study, Bible school organized, order, graded lessons, and a bibliography.

Indian moral instruction and caste problems. By A. H. BENTON. New York, Longmans, Green and Co., 1917. 121 p.

This is an intimate and detailed study of one of the most central problems of Indian life. The writer treats of the various unique features of that life, of the education department, relations of the state to religion, and of religion to morality, moral improvement and reformation, remedial measures.

Christian Science and the ordinary man. By WALTER S. HARRIS. New York, G. P. Putnam's Sons, 1917. 343 p.

This is a discussion of Christian Science and Mrs. Eddy. The chief topics are, "Is God All?" Do Matter and Evil Have Reality? The Mortal and Immortal Mind. Cure of Sickness. Carnal Law. Mind and Spirit are All. The Way of Salvation. Correction, not Punishment.

Revelation and the life to come. New York, G. P. Putnam's Sons, 1916. 216 p.

This anonymous work was originally printed privately. It contains three parts, (1) Resurrection in the Light of an Experience, (2) The Comforter or Spirit of Truth, (3) Revelation and the Life to Come, with a number of appendices.

The building of cities. By HARLEAN JAMES. New York, Macmillan Co., 1917. 201 p.

This book first tells us of Washington, our capital city, then discusses the plans of four large cities, and then passes to its proper theme, city-planning, with sections of purpose, which is defined as health, schools, morals and business sites, outside connections by water, railroad, street-car, parks, zones and blocks. The last section is on the city of to-morrow.

Association of American Universities. Journal of proceedings and addresses of the eighteenth annual conference. Published by the Association. 99 p.

This eighteenth annual conference of the twenty-three institutions, members of this association, was held at Clark University, November 10th and 11th, 1916. It was well attended, and the chief theme of the sessions was research, although the inevitable subject of degrees (this time especially for law and medical schools) occupied most of one session.

Faith, war, and policy; addresses and essays on the European war. By GILBERT MURRAY. Boston, Houghton Mifflin Co., 1917. 255 p.

This is a general review of the war and its interest is mainly historical. It is a fair representative of the mind of an English liberal, standing just outside the circle of official politics. Hence the papers are arranged in the order of time, and discuss the faith with which England entered the war and continues it.

English grammar, descriptive and historical. By T. G. TUCKER AND R. S. WALLACE. Cambridge, University Press, 1917. 175 p.

This work attempts to bring a knowledge of comparative and historical grammar of English to bear on the phenomena of our language as it is. Without these, descriptive grammar is dry and over-detailed. Accordingly, the work is divided into two parts, (a) descriptive, (b) historical.

- His family.* By ERNEST POOLE. New York, Macmillan Co., 1917. 320 p.
This is a novel with various pedagogical, psychological, medical, social, and other factors, the review of which belongs elsewhere.
- Selections, moral and religious, from the works of John Ruskin.* With notes and comments by Frederick W. Osborn. Boston, Richard G. Badger, (c. 1917). 65 p.
- Outline and suggestive methods and devices on the teaching of elementary arithmetic.* By FRANKLIN P. HAMM. Philadelphia, J. B. Lippincott Co., (c. 1916). 40 p.
- The battle of the Somme.* By JOHN BUCHAN. New York, George H. Doran Co., (c. 1917). 264 p.
- The British navy at war.* By W. MACNEILE DIXON. Boston, Houghton Mifflin Co., 1917. 95 p.
- Ontario Department of Education. *Summer courses and examinations in 1917 for teachers.* Toronto, A. T. Wilgress, 1917. 109 p.
- Ontario Department of Education. *Regulations, instructions and courses of study in elementary agriculture and horticulture for public and separate schools.* Toronto, A. T. Wilgress, 1917. 26 p.

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MENTAL HYGIENE AND THE CONDITIONED REFLEX

By WILLIAM H. BURNHAM

In the human infant the immaturity of the nervous structure at birth and the long period of development which must elapse before functional maturity is attained, give especially favorable opportunity for education. This was long ago pointed out by the philosopher Anaximander and has been emphasized in modern times by John Fiske, President Butler, and others. Apparently, as has been suggested by Rubner, the vegetative functions predominate for a long period in the human infant in order to give a better opportunity for the development of the brain. The activity of the child at birth is controlled by the lower brain centers, the paleocephalon, or old brain; the neocephalon, or new brain, which began to appear in the evolutionary series with the lizards, and controls the higher mental processes, does not yet function.

The outstanding difference between the nervous mechanism of the child at birth and that of the adult is that the child is a paleocephalic organism. Its nervous mechanism responds to biologically adequate stimuli, but not to associative stimuli. The neocephalon, the special organ of association, is undeveloped. But, while the child is born without the use of this master organ of the human body, gradually after birth the higher functions of the brain are developed.

Thus in mental hygiene and the hygiene of school education we are concerned primarily with the normal development and hygiene of the new brain, or neocephalon. How shall we study

what goes on in this vast laboratory of millions of neurones, where, to adopt Mosso's phrase, one reads "No admittance" at every door and corner. Two ways of determining concretely what occurs normally in the brain have been used, namely, first, by observing the activities of an individual; second, by studying in the laboratory the reactions of a muscle or of a gland. The first method, especially the study of the spontaneous activities of children in play and other forms of motor reaction, gives important indication of the functioning and development of the brain. Some of the older investigators, Mercier (12) and Warner (15), for example, attempted a systematic study of cerebral development by the study of movement, supplementing observation by the use of various motor tests. The most important result of such investigation, apart from the determination of certain symptoms of disease, was perhaps the formulation of the general law of the sequence of this development, viz., that in a given physiological series the nervous control of the larger, more central, and more fundamental muscles, is acquired before that of the smaller, more peripheral, and accessory muscles; those of the shoulder and arm, for example, before those of the hand and fingers. But in regard to the higher processes of association, and the like, these investigators never succeeded in getting to very close quarters with the problem.

Recently the other plan of studying what occurs in the brain by studying in the laboratory the reactions of a gland or motor organ has been tried; and new and most ingenious methods devised. It is too soon to foretell the outcome; but the attempt to devise an objective method of studying the functions of the neencephalon is so important that a description of it in some detail should be given.

The pioneer of this objective study of the specific activity of the brain was Setchenov (11). The result of his study was published in Russian in 1863 in a work called "The reflexes of the cerebrum." His work was followed by that of Pavlov in Petrograd, whose preliminary results were published in 1897 in his book, "The work of the digestive glands;" and the most serious and most extended objective studies of the development of the associative function have been made by him and the Russian school of investigators who have collaborated with him. Assuming that associations are formed in the brain cortex, Pavlov (14) devised an objective test for association, and thus was enabled to study what happens in the neencephalon. His method is called that of the conditioned reflex.

The Conditioned Reflex. If I give a dog a piece of meat, immediately the salivary glands of the animal begin to function

and to secrete saliva. This is an ordinary reflex act. Now, if every time I feed the dog meat I ring a bell, after a time I may ring the bell without giving the meat, and yet the saliva reflex will occur and saliva be secreted. In the latter case an association has been formed between the auditory stimulus of the ringing of the bell and the ordinary stimulus of the meat. Physiologically the difference between this reflex and the simple reflex is that, in the former, lower centers alone function; in the latter, the connection between the peripheral stimulation and the response of the gland is mediated by the brain cortex.

The ordinary reflex act Pavlov calls an *unconditioned reflex*. The odor or taste of the meat is a biologically adequate, or as Pavlov calls it, an unconditioned stimulus; the secretion of saliva, the natural reaction. The salivary reflex on occasion of the ringing of the bell without meat he calls a *conditioned reflex*. This is due to the association of the indifferent stimulus of the bell with the biologically adequate stimulus of the food; and the ringing of the bell is called a *conditioned stimulus*.

Pavlov (4 and 14) and his students have made many investigations with an elaborate technique, chiefly upon dogs; and Boldirev (4), Kasherininova (4), Wurzel (4), and others have shown that every phenomenon of the external world for which an animal has perceiving organs, such as a tone, whistling, noise, cold, heat, mechanical stimulation of the skin, movement, and so on, is capable of association to produce a conditioned reflex in the animal.

Pavlov's students (4) have succeeded in establishing in certain dogs five or six conditioned reflexes and for different sense organs. Orbéli has made interesting observations on vision and the reflexes obtained by means of the visual organ. Zéliony and Bielakov have established a most marvelous acuteness of the auditory organ, and Kacherininova has shown that mechanical stimulation is a stimulus for the salivary gland, and still others have made similar observations for other senses. As a matter of fact any stimulus from any receptor organ may become associated with the biologically adequate stimulus and form the conditioned stimulus producing a conditioned reflex.

The significance of the conditioned reflex is simply this, that an associated stimulus brings about a reaction; and this associated stimulus may be from any receptor organ of the body; and it may be formed of course, not merely in the laboratory by our specially devised experiments, but by association in our ordinary environment.

We are familiar with the doctrine that a definite stimulus produces a definite reaction, that a group of stimuli, a situation, produces a definite reaction. We are familiar too with the doctrine that a normal organism is made up of tendencies to react, certain definite tendencies fitting definite situations like keys fitting locks. But in the conditioned reflex we have an indifferent, an arbitrary, if you please an unnatural stimulus, bringing about a reaction similar to the natural reaction because associated with it.

One should keep clearly in mind the way these terms are used. The ordinary reflex is called an unconditioned reflex, the reflex resulting from an associated stimulus is called a conditioned reflex, and the associated stimulus which produces the conditioned reflex is called a conditioned stimulus.

The formation of a conditioned reflex involves association; and the brain, especially the cortex, is generally assumed to be the organ of association. While we can find no dramatic beginnings, even for associative memory and the ability to profit by individual experience, nevertheless the neencephalon has developed especially as the correlative of associative memory, and the cerebral cortex has developed, we must believe, according to the neural law of association as suggested by the studies of Kappers, and we may best study its ability in different stages of maturity by testing its associative function.

That this method of the conditioned reflex actually indicates processes that occur in the brain cortex has been shown by the Russian investigators. Orbéli (4) expresses the results as follows: "We are altogether completely justified in considering the conditioned reflexes as a function of the cortex of the cerebral hemispheres. At least Tikhomirov, Makhovsky, and myself have succeeded in extirpating different zones of the cerebral cortex in rendering the formation of conditioned reflexes impossible for special receptive surfaces."

THE STUDY OF CHILDREN BY THE METHOD OF THE CONDITIONED REFLEX.

Dr. Krasnogorski (9 and 10) of Petrograd has employed Pavlov's method of the conditioned reflex in the study of children, taking as the response of the child to the conditioned stimulus a motor reflex, namely, the opening of the mouth in case of older children and sucking movements in case of infants. By the aid of this method he reports that he was able to observe in children quite accurately the origin, development and extinction of different conditioned reflexes and to establish certain laws for such reactions. In its simplest form his

method was merely to give a chocolate bonbon to a child and at the same time to give a sensory stimulus, for example, a dermal stimulus or the like. After a few repetitions the response of opening the mouth occurs without the bonbon if the dermal stimulus is given.

The investigation by Krasnogorski was a pioneer piece of work, the number of children tested was small, his apparatus was defective, his methods crude, the report of his results incomplete; but his work is so important as an attempt to use an objective method in the study of the functioning of the brain cortex in children that we may well give attention to it somewhat in detail. I shall give the account very much as he reports his results, even though they may need to be modified in view of more recent studies.

The mechanism of the conditioned reflexes in the child varies from that of the animal in different respects. The first characteristic in the child is the extreme rapidity of its acquisition. In the case of the normal child it is enough to let the effect of any stimulus occur in connection with the opening of the mouth from two to ten times for the temporal association to be formed and for the associated stimulus to call forth independently the opening of the mouth. Further characteristics of the conditioned reflex in the child are the high stability of the association formed and the ease with which it is broken down. The newly formed conditioned reflex in case of a normal child lasts for a long time, but at any time it can be quickly broken up and again reestablished.

The ability to form conditioned reflexes develops earlier for some children probably than for others. It develops earlier perhaps for some receptor organs than for others, and apparently it develops earlier for normal children than for the feebleminded.

In the first two or three months of life, according to Krasnogorski, the cortical innervations are so little developed that the different associations in general cannot be formed. In the second half of the first year of life the formation of such associations for all receiving surfaces, the eye, the ear, the nose, skin, is possible; but it occurs more slowly than in later life. Not until in the course of the second year does the mechanism of the conditioned reflex attain its complete development and functional perfection. Miss Mateer (11), however, was able to establish conditioned reflexes at an earlier age in many children.

Memory Reflexes. The reaction of the salivary glands, as we have seen, will occur in response to an indirect stimulus, the stimulation of the skin, for example, occurring simultane-

ously with the feeding. Not only is this true, but Pavlov found that the mere memory of the indirect stimulus may also bring about the response of the glands. If, for example, a dog is repeatedly fed, not during the period when the skin is stimulated, but not until two minutes later, that is, after the immediate stimulation of the skin has passed and there are in the cortex only traces of this stimulation, then after some repetitions the direct stimulation will call forth no secretion, this does not occur until two minutes afterwards; thus not the skin stimulation as such, but the memory of this becomes the excitation for the salivary glands. The same is true of the child. If a child is repeatedly given a chocolate bonbon, not when the dermal or other sensory stimulus is applied but two minutes later, then after a dozen or more repetitions the response of opening the mouth will occur, not when the dermal stimulus is applied, but two minutes later. This class of conditioned reflexes Krasnogorski distinguishes as specific residuum reflexes, or we may call them memory reflexes. The characteristics of these distinguish the functioning of the human brain from that of the animal.

The memory reflexes in case of the dog show quite distinct characteristics. They are completely free from any specific character, such as characterizes the usual conditioned reflexes. If, for example, a reflex is formed for the memory of dermal stimuli, then the secretion of saliva occurs not only after the skin stimulation, but after all other possible stimuli—tones, noises, smells, etc. Another characteristic feature of this reflex is its unusually quick almost sudden extinction, the great secretion of saliva, and the vigorous motor reaction. It is very different in case of the child. A highly specific character and extraordinary precision are characteristic marks of memory reflexes in them. If, for example, in case of a child the memory of the sound of a metronome is made the excitation for opening the mouth, then the motor reaction occurs from the beginning only after this stimulus, while other stimuli, even related ones, for example the blow of a hammer, are absolutely ineffective. Every memory of a stimulus in case of a child is highly specific and can quickly be brought into temporal association with any activity whatever.

There are also essential differences between man and the animal in respect of the *formation* of the memory reflex. In case of the dog the memory reflexes are formed with great difficulty and easily destroyed. In case of a dog too, it is enough to repeat the memory reflex only once without the unconditioned stimulus to destroy the reflex. In case of children, on the other hand, the memory reflexes are formed as easily as the

usual temporal associations. The memory reflexes are destroyed in case of the child, not suddenly, but just as the simple conditioned reflexes are. Thus the highly specific character of the memory reflex, the quickness with which it is formed, its duration, its regular and gradual extinction, are the characteristics of this group of reflexes in children.

The development of the mechanism of the memory reflex in the child occurs much later than the development of the mechanism of the usual conditioned reflexes. While the ordinary conditioned reflex may be formed in the first year of life, the mechanism of the specific memory reflex, on the other hand, according to Krasnogorski, it is not developed until during the second year.

It is interesting that in case of a definite type of "over-excitable neuropathic" children, the specific character of the memory reflex is greatly reduced. In case of imbecile and debilitated children its formation is difficult; in case of many idiots it is altogether impossible. As a clinical test, according to Krasnogorski, the memory reflex is of great importance since it determines the degree of development and the accuracy of the functioning of the cerebral hemispheres and makes possible the diagnosis of cerebral anomalies at an early age.

Analysis. The next fundamental mechanism in the functioning of the cerebral cortex studied by Krasnogorski is what he calls the mechanism of analysis, or sensory discrimination. Besides the ability of forming temporal associations there occurs also in the cortex the extraordinarily extended analysis of stimuli from the periphery. According to Pavlov's terminology Krasnogorski names the nervous mechanisms functioning this, analysers. The analysers separate the external stimuli into parts, and by the mechanism of association these parts at any moment can be brought into contact with any desired activity. In a word, the function of the analyser is the differentiation of stimuli, or sensory discrimination.

Inhibition. Pavlov and his students have made interesting investigations of inhibition. If one scratches a dog every time he is fed, then the scratching becomes a conditioned stimulus; that is, it occasions a secretion of saliva when no food is given. Now when a conditioned reflex of this kind has been formed, if during the scratching stimulation a new stimulus, say, for example, a tone which has been made a special stimulus is added, immediately the scratching stimulus loses its effect. Also the adding of another unusual tone to a usual one inhibits the salivary reflex, and the intensity of the inhibition is dependent on the strength of the given tone. In like manner a great

number of subtle and most varied influences act to arrest the conditioned reflex.

In all development and training of the central nervous system, inhibition is as important as response. According to Krasnogorski stimulation and inhibition are in a certain sense the two halves of one and the same activity of the nervous system. Krasnogorski maintains that in the conditioned reflex we have an almost ideal method of investigating the process of central inhibition in children.

In the child's central nervous system all kinds of inhibitions are occurring, but the mechanism of inhibition attains its highest development in the human brain. In Krasnogorski's earlier investigations, when studying the memory reflex, the fact of the extremely fine and high development of the mechanism of inner inhibition in case of the child appeared. The formation of the memory reflex, as shown by these investigations in Pavlov's laboratory, rests on the development of special processes of inhibition. But this inhibition develops very slowly in case of a dog and is incomplete. Consequently the memory reflexes have only a general character and disappear quickly. It is very different with the child. The quickness of the formation of the specific memory reflex, and the quick development of the inhibition produced by a definite stimulus, the high specific character of the memory reflex, its slow gradual extinction, and its easy revival, appear to be fundamental characteristics of the reflexes of this group in case of children.

The formation of conditioned inhibitions similar to the conditioned reflexes occurs more quickly in children than in animals. The development of the mechanism of the conditioned inhibition occurs in case of the child at the end of the first year of life. This result is important as it shows that at this time the child can be educated. The mechanism is formed differently in the case of different children. In the case of the normal child, five to ten experiences is enough. The rapidity of development, the strong inhibitory effect, the quick extinction and the slow fading out in course of time, are characteristic marks of the conditioned inhibitions in case of the normal child. It is different with pathological children. With many idiots and imbecile children the conditioned inhibition cannot be formed at all or only with great difficulty, and the inhibitions formed for the most part have a very weak inhibitory effect and are very quickly extinguished.

Storing and Discharge. Dr. Krasnogorski (10) studies also another mechanism, that of nervous storing and discharge, which in his opinion represents the greatest complexity and the greatest power of adaptation in the child's cortical activity.

In the case of a child five years of age a conditioned reflex had been formed for the sound of a loud ringing bell. For some days repeated dermal stimulations were made without giving bonbons. As a result the skin stimulation as such was made, he thinks, completely indifferent for the child's nervous system. Then he began again the ringing of the bell, between the separate dermal stimulations, without accompanying the ringing with chocolate, but giving the bonbon only during the dermal stimulation following the ringing. The ringing served as a signal that the first dermal stimulation following would be accompanied by the giving of chocolate. As a result the first dermal stimulation after the ringing became specific and after some repetitions produced the motor act.

The following is a concrete example. A definite point on the skin of the upper arm was stimulated. No reaction followed. After ten minutes this stimulation was repeated, with no reaction; then after ten minutes more the bell rang for half a minute. The child showed no reaction. After three minutes the given place on the skin was stimulated, and then a vigorous reaction of the mouth occurred. Thus neither the ringing of the bell nor the stimulation of the skin alone could excite the motor apparatus. Not until the skin stimulation followed the ringing did the motor act occur.

It is clear that by the stimulation with the ringing a center of stimulation is developed in the cortex. The energy remains stored up in a latent or inhibited condition, but can be discharged at will as soon as the dermal stimulation is received. In this case the dermal stimulation in a certain sense is like pulling the trigger of a loaded gun. We load the nervous mechanism with the ringing stimulus, and this load remains in the cortex and can be discharged at any moment if we move the trigger, that is, if we give the dermal stimulation.

The mechanism of storing and discharge is broken down also in the usual manner by withholding the bonbons which served as the stimulus.

The mechanism of positive and negative storing and discharge, according to Krasnogorski, gives man his great superiority over the animals. It is developed relatively late in children, later than the other mechanisms described. It begins its function at the end of the second year of life, but is still incomplete. Not until the third year of life does it attain its full functional development.

This mechanism is most easily affected by pathological conditions. In case of the majority of nervous children it is seriously disturbed. In the case of one class of neuropathic children, what Krasnogorski calls the over-excitabile type, the

formation of this mechanism is very quickly completed, but it persists only for a short time and is soon dissipated. In other words we have children here who learn very easily and who lose very quickly what they have learned. In case of a second type of neuropathic children, the dull type, the storing of energy is effected with extreme difficulty. In the case of still another type, the storing is extremely easy, the discharge on the other hand occurs with great difficulty. There are children with weak inhibitory mechanism who are very hard to educate since errors are acquired quickly and held very obstinately. With many idiots and imbeciles the formation of positive and negative storing of energy is completely impossible.

What we have in such cases of storing and discharge is a delayed reaction, and the amount of delay possible seems to be roughly correlated with the mental development of the individual. Mr. Hunter (8), in a recent number of the *Behavior Monographs*, has reported experiments on delayed reaction which are very interesting in connection with some of Krasnogorski's work. Mr. Hunter experimented both with animals and children and found that within certain limits, "rats (one excepted), dogs, raccoons and children, made successful reactions in situations where the customary determining stimulus was absent at the moment of response." In case of children the experiments were arranged as follows: The child when released by raising a gate was told to push one of several buttons on the wall, and told that one of them would make a noise, and, if the child pushed the noisy button first, he would receive candy. Then a light was placed over the noisy button. The child was held five seconds and then allowed to push the button, then the period of delay before releasing the child was increased continuously until an error was made. The maximum delay for rats was ten seconds, for dogs five minutes, for raccoons 25 seconds, for children twenty-five minutes.

The cortical mechanisms described by Krasnogorski represent fundamental forms of the child's cerebral activity. Only by the clinical test of the ability of the child to make temporal associations, conditioned inhibitions, and specific memory reflexes, only by determining the power of analysis and by the investigation of the mechanism of storing and discharge, can we understand and analyze the true relations in the child's cortical activity. The neurological basis of these associations is apparently the development of temporary centers or foci of stimulation in the cortex. According to Krasnogorski the fundamental characteristics of these centers are their temporal and conditioned character and extreme instability. Their size and extent is in constant process of change according to the

degree of the differentiation and the conditions of function of the other parts of the cortex. We must assume that the whole cortex is sown with such conditioned centers, which now arise, now disappear, now enlarge, now grow smaller, and are connected with this or that cortical system according to the conditions of their origin.

As pointed out by Krasnogorski, many things modify the ability to form conditioned reflexes, especially all sorts of pathological conditions; fever, cerebral lesions, and idiocy, for example, making the formation of associations much more difficult or entirely impossible.

Among neuropathic children as regards the conditioned inhibitions there are different types. With the over-excitabile type the conditioned inhibitions are very easily formed, very quickly extinguished, and extraordinarily quickly destroyed by time. On the other hand in the case of the dull neuropathic children, they are formed very slowly and relatively strong stimuli are necessary. In the case of certain children of this group the conditioned inhibitions persist for a long time, although in the case of others they show a very unstable character and are likely to be quickly destroyed. The latter are the children who learn with great difficulty, forget quickly what has been learned, and for that reason are very difficult to educate.

The most extensive and thoroughgoing application of the method of the conditioned reflex with children has been made by Dr. Florence Mateer (11) in an investigation carried on at Clark University. Her study has demonstrated the practicability and value of this test as an objective method of studying child behavior.

The results of this method as stated by Krasnogorski must, of course, be verified. This to a large extent Dr. Mateer has done. She has modified and improved his method and used it in the study of both feebleminded and normal children, 67 in all. Her task was primarily to test the value of the method, but she obtained interesting and significant results. Furthermore Dr. Mateer compared the results found by this method of the conditioned reflex with the results of the other usual methods—the Binet-Simon, Yerkes, etc., and calculated the correlation coefficients of the results found among her unselected group of 50 children.

Dr. Mateer's results are significant and suggestive in regard to the development of the child's ability to form associations. The one general significant result being that the power to form associations increases with increasing age. She sums up her results as follows:

"It is clearly to be seen that up until the age of five the

number of trials necessary for the formation of the conditioned association decreases rather regularly as the chronological age of the child increases. Above this the curve is not only less regular but the range of trials necessary for any one age is also greater than for the ages just preceding. This can hardly be due to any great difference in the ability of the older children as a group, for they were in most instances (in 15 out of 20) the older brothers and sisters of the younger children used. It may be possible that we have here a symptom of an innate difference of different periods of development. The older child may see or imagine, because of his greater experience, and consequent greater potentiality of associations, possibilities of variation in the procedure to which the younger child is oblivious being absolutely sure after he has been fed candy under a given condition once or twice that it will appear again under like conditions. Genetically viewed, this difference may be as significant as a mark of old stages of development as are the differences recognized to-day between the adolescent and the pre-adolescent."

The ease and quickness with which children develop the ability to form associations differ greatly with different children. Representative results are given by Dr. Mateer (11), who says:

"It may be interesting to note that no child over two years of age needed more than eight trials while none under that age used less than seven, none under three years needed less than six, while the minimum number, three, was all that were required by a child in the fourth year. Out of the fifty children, regardless of age, ten needed only three trials, eleven needed four trials, eleven used five trials, while only seven needed six; five needed seven, four needed eight, and two, nine trials."

As President of the American Psychological Association at its annual meeting in 1915, Dr. Watson (16) gave an account of preliminary investigations that he has made using one of Bechterew's methods, namely, producing the reflex by giving a sound stimulus in connection with a strong electro-tactual stimulus.

Dr. Watson's device was to give an electric stimulation of the finger, the experimenter sitting in a different room provided with a bank of keys by which he could give at will the sound of a bell coincidentally with the electric current or separate from the current.

He proceeded as follows. In beginning the work with a new subject he first sounded the bell to see if this would directly produce the reflex. In no case did he find the reflex

evoked by the bell alone prior to the electric stimulation. Next the bell and shock were given simultaneously for five trials, then the bell was tried again. If there was no reaction then five more stimulations with the bell and current simultaneously were given, and so on. He found that the conditioned reflex would appear at first haltingly, that is, appear once and then disappear. Punishment, or the electric shock, is then again given. It may next appear twice in succession and then disappear. After a time it appears regularly every time the bell is sounded and he reports that he obtained a conditioned reflex in the best cases after 14-30 combined stimulations.

Watson's experiments were tried on eleven human subjects, one dog, and seven chickens. In the case of the dog he stimulated the sole of the foot and recorded the resulting leg movement. Six of the seven chicks showed the conditioned reflex in the respiratory curve. In one he failed to get a reflex.

In the course of twenty minutes the investigators obtained the reflex several times upon an eight year old boy. "When first punished by the electric shock he cried and was somewhat reluctant to continue the experiment. He was promised a moving picture show after the experiment and this made him complete the series with smiling fortitude."

Watson summarizes the various uses to which he thinks this method may be applied, as follows:

"1. To all forms of experimentation on light, size, form, visual acuity, etc. It is apparently the only method which will enable us to study visual after-images in animals.

"2. It is apparently the only existing method of testing auditory acuity, differential sensitivity to pitch, range of pitch, timbre, etc., in any reasonable length of time.

"3. It affords us, by reason of the fact that the stimuli may be given serially, a method of testing the rôle of olfaction. We know nothing now concerning olfactory acuity, differential sensitivity to olfactory stimuli, classification of stimuli, the effect of such stimuli on the emotional life of the animal, etc. Nor is it very feasible to carry out such experiments by the discrimination method.

"4. The method gives a reliable means of testing sensitivity to temperature and to contact and to the fineness of localization of such stimuli—factors which likewise cannot be determined by methods now in use."

Illustrations of the significance of the conditioned reflex in pathological phenomena have been given by Heilbronner and Watson. The latter gives the following examples of conditioned motor reflexes:

"In the moving picture tragedies the suicide of the villain is often shown. Usually the hand only of this unfortunate individual is displayed grasping a revolver which points toward the place where his head ought to be. The sight of the movement of the hammer on the revolver brings out in many spectators the same defensive bodily reaction that the noise of the explosion would call out. Again we find in persons recently operated upon numerous reactions such as deep inspirations, cries of pain, pronounced muscular movements, the stimuli to which are the cut and torn tissues themselves. For many days after the disappearance of the noxious stimuli the reactions will appear at the slightest turn of the subject's body or even at a threat of touching the wound. Similar instances of this can be seen in many chronic cases. In such cases the charitable physician characterizes the patient as having 'too great a sensitivity to pain.' The patient, however, is not shamming in the ordinary sense: conditioned reflexes have been set up and the subject makes the same profound reactions to ordinary attendant stimuli that he would make to the noxious stimuli themselves."

This method of the conditioned reflex has now been used by a number of Russian, French, and American investigators. The demonstration of its value in the study of children by Krasnogorski in Russia and Drs. Mateer and Watson in this country constitutes an epoch-making contribution to genetic pedagogy and school hygiene.

Krasnogorski has suggested that the so-called tests of intelligence should be replaced by the purely physiological investigation of these cortical mechanisms. He emphasizes the great clinical importance of this conditioned reaction. With the help of this, it is possible, he says, not only to follow the whole development and growing complexity of the cortical activity of the child from the first weeks of life, but also in different pathological processes to establish objectively the degree of disturbance. The test of the cortical mechanism gives also the possibility of showing in the first months of life the peculiarities and defects of the cerebral functions, and thus of beginning pedagogical training at an early age. If the method is all that Krasnogorski claims for it, it would seem likely when developed to give an objective and more satisfactory method of testing the intelligence of children, especially young children, than any other tests we now have.

HYGIENIC SUGGESTIONS

The study of the conditioned reflexes throws light on many things in human behavior, not only on the obvious phenomena

of habit and association; but on many other things in ordinary everyday life, for example, the peculiar behavior of many children, the tricks and mannerisms and forms of misbehavior of normal children as well as the hysterias and defects of the abnormal, the bizarre acts of adolescents and adults, the peculiar disorders and neuroses that often occur, the eccentric character of many crimes, as well as many ordinary forms of behavior. The writer will venture to suggest a number of examples where the question may be raised whether they be not cases of conditioned reflexes.

The question naturally arises how is the conditioned reflex related to habit. Habit is a generic term used rather loosely for any customary reaction. From any instinctive reaction or response a habit or group of habits can be developed. But also conditioned reflexes may be developed in connection with any instinctive response. Eating, for example, is an instinctive reaction. Of the habits connected with the instinctive response of eating, are those in regard to the method of eating whether one chews on one side of the mouth or the other, whether one eats rapidly or slowly, whether one takes large mouthfuls, or small mouthfuls, and so on and so on. Of the conditioned reflexes connected with eating, of which Pavlov has given us illustration, is the response of the secretion of saliva and the digestive juices to the dishes perhaps in which the food is served, the flowers that may be on the table, the companions, and what not.

The line of distinction between habits and conditioned reflexes is not clearly marked. All conditioned reflexes are incipient habits. Many habits are conditioned reflexes at the outset. But we use the word habit in a loose sense referring to many instinctive reactions or those developed pretty directly from the instinctive reactions as well as to more artificial responses like the conditioned reflexes. Habit is a more generic term. Again habit usually connotes reactions of a rather stable and permanent character; conditioned reflexes are usually unstable and often temporary in character.

Modern study, however, has made the doctrine of habit much more vital and significant. The studies of the conditioned reflex suggest that a habit involves a series of such reflexes; and this has brought quite a new point of view, a new conception of habit, and emphasized the significance of habit for the health of the individual.

For every form of motor activity, for all the situations of our daily life, for all the receiving organs of our body, such habits are developed. And all this shows emphatically the significance of the education in this sense during the early

years of life. We see again that the acquisition of habits of healthful activity both physical and mental is the one thing of prime importance in the education of children in the early years. If this is acquired, it does not matter if little in the way of scholastic education is given, but nothing can atone for the loss of opportunity at this period and the acquisition of undesirable and pathological reflexes.

We know relatively little about the conditioned reflexes and habits developed by our ordinary school and home environment; but the studies made show the vast number of them developed in a child during the period of school life, groups of habits and associations for every subject of study in the curriculum, perhaps for every teacher and companion, and the importance of these for the mental health of the individual. Let us note some examples of conditioned reflexes in animals and children.

In the training of animals, of course, we have many illustrations of the conditioned reflex. Kallischer has given so-called tone training to different animals; to monkeys, for example, giving them food with a certain definite tone and withholding it with other tones; and he habituated them to grasp the food only at the proper tone, that is, the tone associated with the giving and eating of the food. In all such training of animals it is very easy to spoil the animal by a mistake or an unfortunate occurrence, which may act as a permanent inhibition, examples of which could be furnished by all animal trainers.

The remarkable inhibitory power that certain trained dogs show is a noteworthy illustration of the conditioned reflex. For example, a Boston terrier was taught to sit in a chair while meat or other food was placed on the floor until permission was given to take the food. Again the dog's favorite food was placed directly under his nose and he was told not to take it; and then, even if the people went out of the room and left the dog alone with his food, he would not touch it until they returned and permission was given.

If one reads a book like Bostock's "The Training of Wild Animals," (1) one sees how largely the training consists in the development of conditioned reflexes. A wild animal, as Bostock points out, is trained but never tamed. A shock, an unusual occurrence, or any one of a hundred unconventional things may arouse again the old savage instinctive reactions. Hence the trainer must always give the performance in the same way and must always give the conventional signals as stimuli.

"If an animal is sent to the right side on entering the arena the first day, he is sent to the right every day thereafter, and the direction in which he goes after leaving his pedestal, and before taking his place in the group, is always the same. Each animal, too, in a group has his own place and his own time for assuming the place; and should he once leave it, there would be danger to the whole performance. The trainer, too, even in walking about the arena, always walks in the same way, and gives his closest attention to the prevention of the happening of anything unusual.

"Performing animals particularly dislike a change in the stage setting, and it is absolutely necessary, whenever a new one is contemplated, to accustom them to it by the most gradual means. There have been times when an animal, seeing a new barrel or block for the first time, would attack it with such gusto that not only would the objectionable piece of furniture be destroyed, but so much excitement would be communicated to the other animals that it would be found impossible to go on with the act."

According to Bostock most wild animals are fond of music and in most cases it is their principal cue. Naturally enough it becomes a conditioned stimulus for many reactions. He relates the following experience which is instructive.

"Some time ago the band of a traveling show went on strike in the middle of a performance, and left in a body. Three trained tigers were the next feature on the program. When they came on they looked inquiringly at the orchestra for the music, and then two of them quietly settled down on their haunches and refused to go on. The third, who was of less experience, made a feeble start and then joined his companions on strike. Orders, commands, threats, and flickings of the whip were useless. No music, no performance, was obviously the motto of these tigers; and they stuck to it until finally the trainer, finding that to try to force them further was dangerous, was obliged to let them return to their cage without giving any performance at all."

Bostock feared that he could never get the animals to perform again, but the next day when the musicians had returned to their work the tigers seemed perfectly satisfied as soon as they heard the music and acquitted themselves better than ever. Clearly the sound of the music had become a conditioned stimulus to the performance of the animals.

In the special training of animals we have to do chiefly with the establishment of conditioned reflexes. A great part of the more special training of a dog, for example, consists precisely in this. The best illustrations perhaps are furnished by those cases where a conditioned reflex closely related to a natural reflex is established.

A friend of mine taught his dog to sneeze at the word of command. I asked my friend how in the world he succeeded in teaching the dog to do this. He told me that in the first

place he rubbed the dog's nose and made him sneeze in this way, and then praised him for it, and after a time the dog acquired the habit, so that he would sneeze at any time at his master's command.

Here we have apparently an excellent illustration of the development of a conditioned reflex. First, by rubbing the dog's nose an unconditioned reflex was produced, sneezing in response to the peripheral stimulation; then giving the word of command to sneeze in connection with the stimulus of rubbing the nose we have in the ordinary way a conditioned reflex developed; the word of command being of course the conditioned stimulus, and this becoming associated with the unconditioned stimulus of rubbing the nose, until finally the associated stimulus, namely, the command, was sufficient by itself to produce the reaction.

In the training of children the development of conditioned reflexes is quite as important as in the training of animals. On the functional side, as we have seen, the most important difference between the child and the adult is that the child is lacking in experience and its brain relatively free from paths of association, and the possibilities of development of conditioned reflexes and habits are great. And again the child has great ability for developing and for breaking down conditioned reflexes because of the plasticity of its nervous system. This apparently is quite apart from the fact that in childhood the field is not yet occupied.

In children one may often note the development of conditioned reflexes by careful observation of incipient habits of speech, gesture, or the like. An observant mother notes that her baby reacted to the first stimulus of the bath by closing her eyes. Now at six months she always closes her eyes when she sees the ordinary preparation for the bath. The associations formed in connection with bathing and the like offer perhaps quite as good an opportunity for testing the child's ability to form conditioned reflexes as those formed in connection with eating. Apparently the child can form conditioned reflexes at a much earlier age than Krasnogorski seems to suppose. Experiments indicate this and observation as well. Apparently a case in point has been reported to me of a child about a month old that was fed with orange juice from a spoon, and at the mere sight of the spoon would open its mouth at once.

Such conditioned reflexes and inhibitions are formed in the early years under the stress of circumstances and by the training of parents and nurses. Many of these are distinctly important habits of health. The young child soon learns, for

example, not to void secretions at the direct stimulus of pressure, but only on occasion of associated stimuli—the customary place, or seat, or the like. The processes of secretion and digestion even are modified by these acquired conditioned reflexes.

Some individuals, for example, cannot have a proper movement of the bowels without smoking a cigar. In the case of others a definite time of the day is necessary. Many must have customary surroundings, and as a result suffer from indigestion in the first days when on a journey. And here there is great danger that undesirable and unhygienic habits may be formed by children. In many individuals the lack of proper habits in regard to digestion and secretion is a most serious menace to health.

Again the habits of cleanliness in the case of the child involve the development of conditioned reflexes.

Especially significant for the health of children are the conditioned reflexes developed in relation to sleep. If with Claparede we look upon sleep as an active process, the act of dropping asleep comes under the general class of reflex activities, and under certain conditions may become a conditioned reflex.

In the course of recent years different workers in Pavlov's laboratory have complained that a somnolent condition of the animals experimented upon handicapped them in their investigations. This difficulty appeared if one chose as a stimulus a heat of 45° or zero condition of cold. In the latter case the experiment would terminate in a profound sleep and complete cessation of all nervous activity.

For a long time the workers in his laboratory noted with surprise the contrast which appeared between the great vivacity and mobility of a dog before the experiment and before his condition of somnolence, then the sleep as soon as the experiment began. It appeared that the cause of this was not in the conditions of the experiment, but that it must be sought in the action of the temperature. Different experiments showed that on one and the same place of the skin one and the same degree of heat or cold inevitably brings the animal sooner or later to a condition of somnolence, and even to a profound sleep. Thus it is argued that a determining agent in the external world can arrest the higher nervous activity in the same way that other agents stimulate the same functions.

As is well known, any number of things may become conditioned stimuli for going to sleep. This is well known in the case of children and many who are troubled with insomnia.

In case of the child it is easy to develop unfortunate conditioned reflexes in regard to sleep. Many children, for example, are trained so that they cannot go to sleep unless there is a light in the room. It is quite as easy and more natural and healthful to train a child to go to sleep as soon as the light is removed from the room.

The ordinary reflex in many cases is strengthened by the conditioned stimulus. Some individuals who use an alarm clock find that they are most sleepy when the alarm clock strikes, and so set the alarm at an early hour in order that it may serve as a conditioned stimulus to give them the pleasure of another nap. In the case of others the alarm serves as a distinct help toward getting up. The ordinary stimuli are not sufficient to cause the reaction of arising from the bed, and the conditioned stimulus furnished by the alarm makes the reaction easy.

As we have seen, the sensation from any organ of the body and probably any event may become a conditioned stimulus for the reaction of a gland or a motor organ. Since the tendency in everyone is strong to form such reflexes and since the opportunity in our complex environment is so great, one wonders that more unfortunate habits rather than less are not developed in children, and one is surprised that not more rather than less abnormal cases should occur. And one sees, finally, the great importance of normal pedagogy and mental hygiene in the care of the young.

PATHOLOGICAL REFLEXES

Heilbronner (6) has attempted to show, how many of the bad habits and neuroses of children are really conditioned reflexes, and he quotes a number of specialists in children's diseases to illustrate this point. He emphasizes further the fact that the opportunities for developing pathological neuroses by the formation of conditioned reflexes is very great. In fact the tendency to this is universal.

The ease with which a pathological conditioned reflex may be developed and the great danger of the development of such reflexes in case of children, are indicated by such neuroses as the so-called tics and the like. In such cases, at greater or less intervals, in severe cases at intervals of fractions of a minute, convulsive twitchings occur which cannot be suppressed. It is very probable, as Heilbronner points out, that the most identical phenomena may have a different origin in different cases; but for a part of the cases, undoubtedly he thinks, the course of development is as follows. First some

external stimulus, frequently a stimulus from the conjunctiva of the eye on account of an inflammation or a foreign body in the eye, gave occasion for a thoroughly normal tendency to winking and twitching as a defense reaction, or a pain reaction, which, after the passing away of the stimulus by cure of the inflammation or removal of the foreign body, still persisted; just as everybody has noticed how long the tendency to protect the eye by the hand continues after some dust or the like has been removed from it. The movements also persist at a time when the patient himself believes that he no more perceives the stimulus, when he has even forgotten perhaps the original occasion of the reaction. The process corresponds throughout to the development of conditioned reflexes with this difference, that it is not a question here of the association of one reaction with a quite new stimulus, as in case of the secretion of saliva on occasion of a definite tone, but of the occurrence of reactions which otherwise appear on occasion of qualitatively identical but quantitatively much stronger stimuli, but now occur on occasion of minimal and subjectively imperceptible stimuli. And further proof that in this case something analogous to the conditioned reflexes occurs, appears from the fact that in favorable cases a cure can be effected in the following way. If one has eliminated the twitchings for a time by reducing the sensitivity of the conjunctiva by a drug they no longer appear when this treatment ceases, that is, when the same stimuli which previously produced the twitchings become active again. The same is true in case of the dog if one does not reinforce the conditioned reflex from time to time by connecting it with the unconditioned reflex.

Heilbronner discusses the well known tendency for diseases once cured to recur, and for habits once broken to appear again. Pathological habits of course are no exception to this general rule. The result of the most fortunate cure is always subject to this danger of a relapse. This danger is especially great if the same circumstances, that is, the same conditioned stimuli under which the pathological habit originally developed return in much the same form. But under certain conditions other stimuli apparently quite indifferent are able to revive the habit supposed broken. In hysterical conditions this rôle is most frequently played by shock or some other emotional event. The old habit returns again more easily the more frequently the breaking and revival of the habit have occurred. This corresponds with the experience of daily life in regard to habit as well as with the results of experimental investigation.

"Another observation more removed from the experiences of daily life is frequently made. It is well known that the result of treatment in many pathological cases is not connected with the kind of cure adopted, but with the form in which it is applied. Thus the psychiatrist may fail with his efforts at cure until he decides to resort to some measure which, as the patient says, has always helped, and which perhaps some old shepherd has recommended. There are many analogies with the artificially created conditions for normal activity of the intestines. Whoever is concerned with the treatment of convulsive or periodically acute disturbances is acquainted with these peculiarities and has ultimately to consider them. In the clinic there is an abhorrence of the electrical treatment of hysterical disturbances. And the electrical current therefore plays a very small rôle, but if a servant girl has come to the polyclinic with an hysterical paralysis of the vocal cords in order to be treated by electricity, because this 'has always helped,' and because on account of her hoarseness she fears she will lose her position, we are not so doctrinaire as to refuse the fulfillment of her wish."

Ibrahim has attempted to show that the so-called *Wegbleiben* of the Germans, that condition where children scream, lose their breath and grow black in the face, is to be considered as a conditioned reflex. This author assumes that in such children on the basis of some special inherited disposition it is only necessary for the cessation of respiration to occur once in a fit of passion for a conditioned reflex to be established. That is to say, when the child loses his breath in a fit of passion and crying, the crying becomes a conditioned stimulus for the stopping of the respiration, and so afterwards every time the child cries in a fit of anger the losing the breath will occur.

While this explanation may not be the true one, it is suggestive, Heilbronner points out, of what is probably the true explanation of a number of other phenomena observed in children. In this *Wegbleiben*, or losing the breath, in children, it is clearly a question of conditions in which psychic factors have a great influence, but which can scarcely be subject to voluntary choice and clearly not a question of the child's design.

For illustration, a child has to pass by a dog's kennel, when suddenly the dog rushes out barking, without, however, being able to do any harm because chained. The child cries, tries to run away, falls, and remains crying and trembling, and is calmed again after a longer or a shorter period with or without any clear recollection of what has happened. The event for the time being remains without any result; but it is noticeable that the child attempts to go around this spot in which the event occurred. It is thought unpedagogical to permit this timidity; the child is forced to walk again by the kennel; but before it comes into the vicinity of the dog

again, the attack of fear recurs. Further attempts at education in this direction are given up; but at any opportunity brothers and sisters or playmates tease and laugh at the child for his timidity. The result is a new attack. This occurs more and more frequently, and under continually varying conditions with each unpleasant impression, a difficult school task, the denial of a wish in case of very slight physical indisposition; and finally even on occasion of pleasant events and a pleasant surprise, or the expectation of such.

The analogy with what has been discussed before in regard to the conditioned reflexes is unmistakable; but an essential difference exists here in the fact that in the typical cases of the development of a conditioned reflex it is a question of the regular and legitimate combination of an accurately circumscribed stimulus with a definite reaction; but in the last example we can trace the way the circle of factors effective as stimuli keeps becoming larger—from the repetition of the original affective situation to the mere mention of the same, and from this to unpleasant situations in general, and finally, to events which have nothing more in common with the original conditioned stimulus than the quality of their affective tone.

The type of the course of events described here is one of everyday life in hysterical attacks, which arouses feeling under similar circumstances. Passion is the first factor which acts as a stimulus. Then one or more repetitions in a certain connection with this, then a mere reminder of this is sufficient, and soon a habit, with the result that the attack then becomes an habitual reaction to all affective occurrences. Finally it is so extreme that it is impossible for the observer to show the affective origin of the separate event, which may be rooted in internal events, memories, or the like, so that the latter appears to result without any cause, of itself. What is true for the hysterical attacks, with slight modifications is true also of other hysterical conditions. A patient has perhaps as a result of an inflammation of the larynx an hysterical paralysis of the vocal cords. The danger is great that every slight cold, which in case of other persons would be cured entirely in a few days, will again leave behind it for a while the same symptoms; not infrequently one finds later that paralysis of the vocal cords is connected with every affective condition in the widest sense.

We can go through the many symptoms of hysteria for the most part in a similar manner. The cure of hysterical symptoms can be based also on the development of conditioned reflexes as pointed out by Heilbronner.

The study of the conditioned reflexes shows that the condi-

tions likely to produce pathological habits are universal, and that everyone is in danger of acquiring pathological reflexes. A number of problems at once arise. Why do those habits we call abnormal develop only in case of a minority of individuals? Why does one individual show a tendency to their development in one direction and another in quite other directions? Why in the case of one individual do hysterical symptoms appear, and why in the case of others some other form of pathological symptom? Heilbronner suggests that the answer to these questions is, that at the foundation of these habits are certain inherited defects, a disposition. Pathological habits presuppose an abnormal individuality as the soil on which they develop.

We may stop just a moment to consider one of the trials and frequently one of the dangers of childhood, namely, the taking of medicine. Probably we can all recall this experience; with fond and ignorant parents it has been well nigh universal. It is a curse of childhood that like the blessings of rain and sunshine falls upon the evil and the good, upon the just and the unjust, alike.

The evil from the taking of medicine is due not only to the drugs contained in it, but also to the ease with which conditioned reflexes are formed. The medicine becomes a conditioned stimulus for sleep, or digestion, or the like. With children there is danger that a drug habit, or if nothing worse, a medicine habit, may be developed. Here especially it is usually wise to let children alone if one does not know what to do for them.

The instincts of children are usually wholesome, and as regards eating and drinking and play and sleep and the like, they are usually more nearly right than the over-anxious parents. In hygienic matters an intelligent ignorance on the part of parents is especially desirable, and unfortunately this is precisely what is usually lacking. And even intelligent parents sometimes do the most atrocious things in the management of their children. Many perhaps can recall the decoctions of herbs and muddy mixtures they had to take in the spring of the year. Booth Tarkington has given a beautiful example, which, if it be not true, is invented with sound hygienic insight. Penrod's Nervous Breakdown should be read and pondered by every fond parent.

Mrs. Schofield became anxious about the health of her boy Penrod. A neighbor told her about a medicine that she had given her own boy with good results. Mrs. Schofield procured it at the druggist's. She attempted to give it to Penrod. The boy rebelled and asserted that he was well. The father was

called in; the boy was forced to take the medicine. The medicine proved odorless and gave no warning of what it was about to do. In the case of Penrod the surprise was complete and the effect shocking. But the dose was two tablespoonfuls before each meal, and the feat of giving it to the boy was finally accomplished.

"So the thing was done and the double dose put within the person of Penrod Schofield. It proved not ineffective there, and presently, as its new owner sat morosely at table, he began to feel slightly dizzy and his eyes refused him perfect service. This was natural, because two tablespoons of the cloudy brown liquor contained about the amount of alcohol to be found in an ordinary cocktail. Now, a boy does not enjoy the effects of intoxication; enjoyment of that kind is obtained only by studious application. Therefore, Penrod spoke of his symptoms complainingly, and even showed himself so vindictive as to attribute them to the new medicine.

"His mother made no reply. Instead, she nodded her head as if some inner conviction had proven well founded.

"'Bilious, too,' she whispered to her husband."

Three doses of this alcohol mixture, which the mother was unwittingly using, were given. And then the boy showed a surprising readiness and willingness to take the medicine. This continued until two bottles and a half were taken; the mother noted improvement in her son, or rather perhaps forgot to worry about him; and after some ten weeks we find the boy playing drugstore with his companion. To increase his stock of medicine he brings out the big bottle from which he had been dosed and the following conversation occurs between him and Sam Williams.

"What's all that stuff in there, Penrod," he asked. "What's all that stuff in there looks like grass?"

"It is grass," said Penrod.

"How'd it get there?"

"I stuck it in there," the candid boy replied. "First they had some horrible ole stuff in there like to killed me. But after they got three doses down me, I took the bottle out in the yard and cleaned her all out and pulled a lot o' good ole grass and stuffed her pretty full and poured in a lot of good ole hydrant water on top of it. Then, when they got the next bottle, I did the same way, an—

"It don't look like water," Sam objected.

Penrod laughed a superior laugh.

"Oh, that's nothing," he said, with a slight swagger of young and conscious genius; "of course, I had to slip in and shake her up sometimes, so's they wouldn't notice."

"But what did you put in it to make it look like that?"

Penrod upon the point of replying, happened to glance toward the house. His gaze, lifting, rested a moment upon a window. The head of Mrs. Schofield was framed in that window. She nodded gaily to her son. She could see him plainly, and she thought that he seemed perfectly healthy, and as happy as a boy could be. She was right.

"What *did* you put in it?" Sam insisted.

And probably it was just as well that, though Mrs. Schofield could see her son, the distance was too great for her to hear him.

"Oh, nothin'," Penrod replied; "nothin' but a little good ole mud."

Where the child is unable thus to appeal from parental nervousness to nature's wholesomeness, it is very easy in the

early years to establish undesirable conditioned reflexes by the use of medicines of different kinds, soothing syrups to put the child to sleep, the use of suppositories, and the like.

The problems involved in the care of children may well make one discouraged; but the one rule should be, when we do not know what is best in the education of a child from a hygienic point of view, to let him alone. With our preconceived notions and the stress of convention, even this is a hard thing to do, as hard as it is simple. The feeling of most parents and teachers is that the least they can do in case of a child is to interfere, whether they know what to do or not.

This doctrine of *laissez-faire* for children as regards hygiene is likely to be deemed dangerous, because we are inclined to be omniscient in regard to the best training for children in ordinary matters concerning health and wish to direct them in our own way, but before we use powerful drugs we should at least consult some competent physician who, we may reasonably suppose, does know.

Probably conditioned reflexes, as has been pointed out, can be formed for other glands, perhaps for all the glands with internal secretion. Especially does this seem probable for the adrenal glands. Unfortunately experiments, so far as I am aware, have not been made to show the reaction of these glands to conditioned stimuli. The experiments of Cannon (3, p. 75), however, have shown that while a football game apparently increases the flow of adrenalin, as indicated by the increased amount of sugar in the blood and the like, also the mere watching of the football game by those players who are ready for it, but not participating, has a similar effect. He reports his results as follows:

"Fiske and I examined the urine of twenty-five members of the Harvard University football squad immediately after the final and most exciting contest of the season of 1913, and found sugar in twelve cases. Five of these positive cases were among substitutes not called upon to enter the game. The only excited spectator of the Harvard victory whose urine was examined also had a marked glycosuria, which on the following day had disappeared."

Why may not this be a case of a conditioned reflex? It is possible that if a football team should choose a dog or the like as a mascot, the mere sight of the animal might in the case of some players on the team stimulate the flow of adrenalin. If so, this would be a clearer case of a conditioned reflex; because the sight of the animal would in itself be an indifferent stimulus, and potent only because associated with the original stimuli.

We are dealing here with definite facts. There is no question in regard to the results found by Pavlov. A conditioned stimulus will produce the secretion of the salivary glands in the dog's mouth. Pleasant surroundings increase the flow of the digestive juices in man. We may naturally assume that a conditioned stimulus may also cause the flow of adrenalin. We can see then what probably may happen in concrete cases in our daily activity.

For illustration take the following example. A man is obliged to do some very strenuous work, perhaps work that strongly arouses his emotions, immediately after dinner for several days. The emotional disturbance right after his dinner causes an increased flow of adrenalin, this checks the processes of digestion, and the same thing goes on for several days; and indigestion results. Here the emotional disturbance is the unconditioned stimulus, or in other words the ordinary biologically adequate stimulus. The secretion of adrenalin is the ordinary or unconditioned reflex. Under such conditions conditioned reflexes are likely to be formed.

The man has had this emotional experience while sitting at his desk in his own office. Naturally enough the situation itself, even the customary place at the desk and the familiar surroundings of the office may become associated with the emotional experience, or in other words, become conditioned stimuli. In that case, after the emotionally trying situations have passed, this associated stimulus, the mere sight of the office, may produce the emotional experience; or perhaps the flow of adrenalin as a conditioned reflex. If this be true, then in such a case every time the man sat down at his desk, the sight of the office would stimulate the adrenal glands, cause an increase in the flow of adrenalin, which in turn would check the processes of digestion, and thus the indigestion become chronic. Precisely this seems to be what happens in certain cases; and the best means of cure is to take the man away from his desk for a few weeks.

In the case of a child, of course, the same thing may happen; any situation or any event may become a conditioned stimulus, stimulating the adrenal glands and causing indigestion. Suppose the child, for example, is punished by his teacher immediately after dinner, or merely scolded or laughed at; the emotional experience resulting may cause an increased flow of adrenalin and indirectly stop the processes of digestion, the schoolroom becomes associated with the emotional experience, and then after the days of punishment or of reproof are over the sight of the schoolroom itself may act as a conditioned stimulus

and cause indigestion, until every time the child enters the schoolroom he is affected in this way and as long as he goes to school is the victim of indigestion. If anybody wishes an hygienic moral here, it is not far to seek. A teacher should never punish a child or reprove one severely immediately after a meal, not merely because it is bad for the teacher's digestion; but still more because it is likely to cause the child to have indigestion.

The conditioned reflex is stronger and more permanent when frequently reinforced by the unconditioned stimulus. Inversely the unconditioned reflex may be assumed to be stronger when reinforced by the conditioned stimulus. Thus the dog is likely to show a greater flow of saliva and of the gastric juices if meat is given in familiar surroundings with all the conditioned stimuli that this implies. So too with man, accustomed surroundings become conditioned stimuli and determine a better secretion of the digestive juices. Better digestion results in case of most individuals when agreeable companions are present furnishing conditioned stimuli. And with other individuals solitude may furnish conditioned stimuli that aid digestion. A vast number of accidental and accessory circumstances may become conditioned stimuli—attractive furniture, beautiful dishes, flowers, views from the window, conventional serving, and so on. President Hall (5, p. 335) has put this tersely as follows:

"We eat more or better or both if the dining-room is illuminated and sunshiny, the walls artistically treated, the dishes, knives and forks, table-cloth, napkins, the personnel and attire of the waiter, satisfy us. Color standards are often prescribed for certain foods. So are forms and modes of serving. Flowers, music, song, help."

"People who eat alone, and especially those who cook their own food, are prone to eat less, with less mastication, more rapidly, with less variety, to become careless and irregular. Man is gregarious, and social converse at meals is one of the best of appetizers, while depression and a sense of isolation are keenest to those who are solitary when they eat. A few of these day-dream of imaginary companions and even set chairs for them, while more think of their friends. The health and spirits of a homeless girl who eats alone are in danger, and she is otherwise a pathetic object. Some young women in our returns confessed that they ate better if there were one or more men present, that an enemy, critic, or other objectionable person might wreck a meal, and so might disputation or violent argument. Harmony, wit, humor, help both appetite and digestion, and converse with a friend is best of all."

Many other illustrations of conditioned reflexes that may occur in our ordinary everyday life might be given. The number is, of course, indefinite. Some of these are favorable to the health of the individual, some are unfavorable. Why is it that odors affect some people so seriously, why do certain

apparently relatively indifferent sounds, or slight dermal sensations, a draft of air, or what not, affect some individuals? Why are some individuals affected so seriously by a slight change in the weather or change of location or the like? In regard to many of these things we may find an explanation perhaps from the study of conditioned reflexes.

In regard to any of the conditions of life we may have conditioned reflexes that favor or that retard health; for example, take the weather. Apart from the direct influence of humidity, temperature, stimulation, or what not, perhaps in case of all persons, a group of conditioned reflexes are developed which largely determine the influence of the weather.

Everyone has perhaps his individual reaction to weather conditions. Personally the writer is rather susceptible to climatic changes. Bad weather is apt to cause more or less nervous disturbance, nervous pains and the like, what a few years ago would have been called rheumatism; but in case of a vigorous snowstorm this is largely offset by a distinct exhilaration which comes from watching the storm or being out in it. I am inclined to think this is a conditioned reflex or group of conditioned reflexes developed probably when I was a child and played in the New Hampshire snowdrifts or walked to school in the storm, since fortunately in those days we lacked any no-school bell. At least a pretty definite attitude tinged with pleasing emotion has been developed toward a severe snowstorm.

Everyone has many such conditioned reflexes. To take another personal example, the writer has plenty of unhygienic habits, but one other group of conditioned reflexes developed in early life has been distinctly helpful and is distinctly hygienic, namely, the group of conditioned reflexes produced by the stimuli of a locomotive and a seat in a railway coach. I may start on a journey tired and nervous; but as soon as I am seated in a comfortable car I relax, the throbbing of the engine soothes me, the freedom from care rests me and the motion cheers me. This habit was perhaps acquired when a child. Like most children I was interested in trains of cars, and the like, and a wise mother never allowed me to be frightened by them. It is certainly much more hygienic for an individual to have such reactions on occasion of a journey than to have the dislike or fear of traveling common with many persons.

Hygiene has plenty of wise suggestions in regard to conditioned reflexes; but most men are deaf to her voice. They are more prone to seek the conditioned reflexes developed by drugs or by doctors. Bad as the drug habit is apt to be, the paradox

is true, nevertheless, that the more harmless drugs often have an hygienic effect because they act as conditioned stimuli for healthful conditioned reflexes. Better still is the assurance of the physician that one is in good health, which many of us need periodically.

Children should be trained to healthful habits in regard to all such important matters as eating, sleeping, and the usual activities of life, that is, healthful conditioned reflexes should be developed. For example, as it is more healthful to be social than unsocial, children should develop in connection with eating conditioned reflexes for society rather than for solitude as a conditioned stimulus. And, as Dr. Cannon has pointed out, our companions at table should be agreeable; and meal-time is not the hygienic situation for reproof and punishment.

If there were time to consider the inhibition of conditioned reflexes, the significance of all this for hygiene would be made still more emphatic. Pavlov, as we have seen, finds that almost any thing whatever, a slight stimulus of almost any kind, is sufficient to inhibit a conditioned reflex. The same we may naturally suppose is true of the conditioned reflexes developed by the stimuli in our everyday environment. To take a concrete case; an individual rises in the morning on a pleasant day, all the favorable stimuli of sunshine, fresh air and one's bath, the conditioned stimuli of an attractive breakfast and pleasant companions and the like, tend to favor appetite and digestion and put one in a condition of well being or euphoria for the day's work. But if bad news, or the slightest domestic friction; or the like, occurs, these favorable reflexes may be inhibited and the individual goes to his daily work handicapped from the start. It has now been shown, if I mistake not, that many of the accidents that occur in industry can be traced pretty directly to some domestic trouble that occurred in the man's home, putting him in a condition unfavorable for his daily task. This opens up a wide and significant field in mental hygiene; but no special investigations have been made here, and this must be passed over.

Pavlov found that a great number of the most different influences can act to cause an arrest of the conditioned reflex. Frequent repetition will also remove this arrest or make it tend to disappear. The process reduced to its simplest terms illustrates how it comes to pass that we no longer perceive disturbances which threaten to hinder us, by developing the orientation or attitude reflexes. Pavlov includes under arrests also the case when the conditioned reflex disappears because it is no longer repeated in connection with the unconditioned reflex, that is, his so-called conditioned arrest. He refers to

further results according to which even this arrest may again be inhibited by a new stimulus, perhaps the flaring up of a lamp, so that therefore the conditioned reflex may again appear; all this may throw light on the experience that an unexpected stimulus, a shock, for example, may suddenly revive a habit supposed to be conquered.

All the passive reflexes are important for the health of the individual and a good part of mental training consists in acquiring such reflexes. All this means adaptation to the conditions by which one is surrounded. Education shows us the importance of noting and registering facts in regard to objects about us. It shows us the importance of giving attention. Hygiene, on the other hand, shows that it is just as important to learn to ignore unessential sensations and impressions as it is to give attention to the essential.

LEARNING AND THE CONDITIONED REFLEX

In all the processes of learning we have long known that the law of association is the fundamental psychological law. The study of the conditioned reflexes has shown that this law of association is more fundamental and far reaching in education than even the association psychologists had supposed, because stimuli not consciously perceived become associated and conditioned reflexes formed. The old view that everything in human acquisition is made up of reflexes and complex reflexes is seen to be far too simple, and now we have to study not only these but conditioned reflexes as well; and the number of conditioned reflexes developed in the course of education may be quite as great as that of the simple reflexes.

The significant thing is that the child at birth has one of these mechanisms, namely, that of the ordinary reflexes, and does not have the other. The child possesses, however vast potentiality for the acquisition of such conditioned reflexes. This gives it its great capacity for learning. And it should be noted that real learning, in distinction from the mere performance of activities for which the neural mechanism is congenital, consists in the acquisition of such conditioned reflexes. Hough (7) has put this very fittingly in making the contrast between such acquisition as what we call learning to walk and real learning, as in learning to talk. In the one case, the mechanism for walking is probably innate in the child as well as in an animal like the colt. The child cannot walk at birth because the neural mechanism which functions walking is not yet fully developed: but there seems good reason to believe that as soon as this neural mechanism is developed, as

indicated by such studies as those of Kirkpatrick, the child walks without any real learning.

It is very different with such acquisitions as that of learning to talk. There may be an inherited mechanism, and undoubtedly is, for making articulate sounds; but the learning to speak a particular language is the case of the acquisition of a vast number of conditioned reflexes.

There are, thus we see, three kinds of learning. first, is the acquisition of those reactions for which the apparatus is congenital and inherited, such activities as learning to walk, the normal reaction of the fundamental organs of the body, suckling, chewing, secretion, and the like. Although we speak of learning to walk and the like, strictly this is not learning at all, but merely the putting into action of these congenital mechanisms which the individual inherits readymade, or which are partly developed at birth and complete their development with normal growth afterward. All these, however, are tremendously important for the health of the individual.

Second, is the form of learning which consists in the acquisition of temporary associations, the temporary conditioned reflexes. A great part of the learning consists of this kind, the associations are formed merely for a temporary purpose, and are normally soon broken down to give place for others.

As Krasnogorski has pointed out, we must then look upon the brain of the normal child as a place where temporary associations and temporary centers of association, are continually being formed and continually breaking down to be replaced by new ones, and we must infer that it is only the general result of all this activity, not usually the particular form of it, that persists and constitutes the general permanent training of the individual. All these acquisitions, however, are important for the general development and character of the individual, leaving probably even when broken down a residuum of character which may be important in determining the generic attitudes and habits of the individual.

Third, is that form of learning which consists in permanent acquisitions. Such permanent associations or habits may be acquired in two ways; first, by many repetitions of the association until the paths become permanently organized; and second, by a single intense initial reaction, or by shock, as we may say. The most important parts of our learning consist of these permanent acquisitions.

There is a significant difference between the temporary associations, temporarily organized conditioned reflexes, and permanent associations. What the difference is in the mode of acquisition which makes one temporary and another permanent

we do not adequately know. Why, for example, should most of the associations and conditioned reflexes that the child forms fade out in a short time if not repeated, and why, on the other hand, should a remarkable sight or the odor of the smoke of a locomotive or a factory or the perfume of a flower bring back after many years the memory of some definite scene and experience in childhood. Or why, again, should a single association of two events or two objects, remain so permanently impressed upon consciousness that no effort can eradicate the memory. The answer to these questions we cannot give, but the difference seems to be largely in the intensity of the initial reaction. A single intense nervous discharge apparently marks out a permanent path in the nervous substance which may be more permanent than that formed by many repetitions of responses of less intensity.

We come here upon some of the most fundamental problems of mental hygiene and of pedagogy. And we see here some of the aims of education from the hygienic point of view, among them the following:

First, the aim of education from the hygienic point of view is to enable the child's organism to acquire those fundamental organic reflexes necessary for normal health and development. For this end it is necessary in the early years that the child be protected from injurious conditions and that opportunity be given for the apparatus necessary for all such activities as the normal movement of the limbs, such as walking, and the normal reflexes of the digestive and secretory apparatus, the normal reflexes of the eye, and the like, to develop. In most cases all that is necessary is to let the child alone and protect from injurious influences.

The second aim of hygienic pedagogy is the acquisition of conditioned reflexes, or habits, if you prefer, essential for health. That is, the child in the early years should acquire those habits which represent the alphabets of normal healthful activity both physical and mental.

The third aim of education from the hygienic point of view is the retention and preservation, so far as possible, of that plasticity of the nervous substance which makes possible not only the acquisition of conditioned reflexes, but also the breaking down of such reflexes, and the acquisition of new and perhaps more important ones. This apparently makes all the difference between the possibility of indefinite growth and that arrest of development which we call feeble-mindedness if it occurs below the stage of normal development for the age of 15 or 16, and dementia praecox, senescence, or the like, if it occurs after that.

The greatest of all differences between individuals is the difference in that subtle inherent character which gives an individual the power for form, to hold, and to break down associations. This is what indicates the learning capacity of the individual in the larger sense of the word, this signifies the individual's capacity for growth and development, or, on the other hand, his susceptibility to arrest of development, feeble-mindedness, or senescence, as one may please to call it.

The bearing of all this upon the concrete problems of school hygiene as well as mental hygiene is probably significant, although we may know little about the whole matter. A few studies already made indicate that in examinations in any of the school activities conditioned reflexes important for health are likely to be formed, for example:

"Of thirty-four second-year medical students tested, one had sugar before the examination as well as afterwards. Of the remaining thirty-three, six, or 18 per cent, had small but unmistakable traces of sugar in the urine passed directly following the ordeal. A similar study was made on second-year students at a women's college. Of thirty-six students who had no sugar in the urine on the day before, six, or 17 per cent, eliminated sugar with the urine passed immediately after the examination." (3, p. 76.)

As regards the higher mental processes, the conditioned stimuli often become a very important condition of thinking. An interesting illustration of this is shown in the experiences of many students. One student reports, for example, that in order to study effectively she must very carefully prepare her toilet and can go to work effectively only after doing this. In the study made by Jones many authors and distinguished men reported that they did their thinking and writing in very peculiar postures. The advantage of this was not purely physical, but the posture was probably to a certain degree a conditioned stimulus producing a conditioned reflex.

It has been reported that certain distinguished men have required certain peculiar stimuli as conditions of intellectual work, varying from the beating of a kettle drum resorted to by one English writer, to the habit of working under the pelting rays of the sun, a habit attributed to Byron, if I mistake not. Such experiences as well as that of the ordinary writer who to do his best work feels the need of his favorite desk, or den, are probably due in part to the conditioned reflexes developed.

That children are likely to acquire the dependence on such conditioned stimuli is, I think, a matter of almost everyday observation. Sir Walter Scott reported that when he was a

boy a schoolmate always stood above him in the spelling class until having noticed that his schoolmate on occasion of a difficult word always fumbled a certain button on his waistcoat, he surreptitiously removed the button, as the story goes, and at the next recitation the boy lacking the ordinary stimulus was unable to spell his word and was displaced by Sir Walter.

The number of things which in case of children and adults as well may become conditioned stimuli for thinking are innumerable,—one's accustomed posture, one's favorite chair, the surroundings of one's study, with many men the inevitable cigar, with some the favorite pen, or even the click of the typewriter, and with others the comforting sensation of the hand in the trousers pocket. Of course some of these are more than mere conditioned stimuli, but in a very important sense it does not seem straining the point to speak of them as conditioned stimuli of our thinking. That scratching the head furnishes a stimulus to thought has become proverbial; but anything whatever may become a conditioned stimulus.

Finally, the whole aim of the school is largely the development of conditioned reflexes, and the work and discipline and surroundings of the school all tend to develop conditioned reflexes favorable for mental work. Thus it comes to pass that children can usually study far better with other children, with the familiar surroundings of the school room, with the presence of the teacher; and even the furniture and adornment of the schoolroom, the posture of the pupils, and the like, all favor the work to be done if the school is rightly organized.

On the other hand, with anything whatever in connection with the school unfortunate and unwholesome conditioned reflexes may be formed. An unfortunate circumstance in discipline or instruction, or an unfortunate method, or a poor textbook, or what not, may arouse conditioned reflexes which mean confusion and repugnance to the given subject. Again in connection with one or more of the pupils an unfortunate circumstance may develop a conditioned reflex of sub-acute rage or fear or the like, so that whenever that individual is seen this unfortunate and unwholesome reflex has its detrimental effect. Even in connection with objects in the schoolroom, anything whatever, such unfortunate reflexes may be formed.

Unfortunately it frequently happens that in connection with the teacher unfortunate conditioned reflexes are formed. Any injustice or cruelty or sarcasm on the part of the teacher may arouse emotions of rage or fear in the pupil, which naturally are suppressed; and then afterwards the sight of the teacher or the sound of the teacher's voice may always act as a conditioned stimulus, bringing up a sub-acute emotion of rage

or fear. All this is usually distinctly unfortunate and unhygienic; and it may not be strange if in many cases indigestion, nervous prostration, or the like, may be developed simply as a result of these conditioned reflexes connected with the careless teacher who has shown injustice or cruelty.

Still more serious results sometimes occur where apparently an unjust teacher becomes a conditioned stimulus that inhibits the pupil's will. Meumann (13) has reported the following case:

A child that he knew entered a new school. His former teacher, who had an antipathy towards the thirteen-year-old boy, introduced him to the new teacher in a tactless manner and blamed the pupil. From this moment the boy, who had been distinguished up to this time, could do nothing more. Not only did his intellectual performance decline from day to day, but his attention and behavior became bad, his affective life became shy and depressed, at the end of the term he was not promoted; in a word, the boy would have gone to pieces if his parents had not taken him away from the school. In the new school the teacher treated him trustfully, and from this moment on the boy was transformed in all his activity; became obedient, had excellent marks, and left the school as one of the best pupils.

This case with will inhibited by the injustice of an unwise teacher and therefore unable to do anything, is apparently a case in point. The sight of his unjust teacher, and the sound of his teacher's voice, always aroused a conditioned reflex which inhibited the normal mental activity of the pupil. We do not need to evoke any transcendental power of the will or the like, it is even more natural to consider that the unfortunate result came from such unwholesome conditioned reflexes and the fact that the child's will was not strong enough to overcome them. And good evidence that this is the correct interpretation is furnished by the fact that removal of the boy to another school at once restored his ability to do good work.

Watson (17) has pointed out the other side of all this and called attention to the fact that the conditioned reflexes connected with the emotions of rage or fear or love may act distinctly as a help and a stimulus to the individual enabling him to do more and better work. Undoubtedly in case of the emotion of love this is often the fact, and it may be true in case of the other emotions:

"As we look back upon our school life," says Watson, "we are convinced that those teachers, both men and women, for whom we have had strong attachments have been the ones from whom we have received lasting benefits. Nor is the case very different with the other two emotions. A teacher who has

on occasion a sharp and caustic tongue can by the use of it induce a modified rage response in his pupils which may be extremely useful in raising the level of achievement of the class. Likewise the teacher who can and at times does induce the fear reactions becomes a powerful factor in the lives of his pupils."

Watson is probably quite right in regard to the influence of many teachers. More commonly, however, it may be feared that the effect of the teacher's sharp words is to cause an inhibition of the pupil's will which often brings it about that the teacher furnishes a conditioned stimulus which inhibits the pupil's activity whenever work is attempted.

Thus we see that a child's education consists largely in the development of conditioned reflexes. These are important both for the physical and mental health of the child. So complex is the whole problem, and we know so little, that the task is a difficult one. To give attention properly to such hygienic education is about all one can do in the early years; but on this the emphasis should be placed.

THE COMPLEXITY OF THE PROBLEM

The significance of the conditioned reflex is that it furnishes an objective method of studying the development and function of the cerebral cortex. Pavlov's discovery that any sensation from any receptor organ may become associated with the original or biologically adequate stimulus and produce the same reaction, furnishes a possible explanation of many unusual and bizarre phenomena of human behavior without resorting to mystical or transcendental hypotheses. It promises a method by which it may be possible to study objectively not only many pathological phenomena, as suggested by Watson and Heilbronner, but many of the phenomena that have been the subject matter of various fads and theories in regard to mental hygiene and the like. The infinite number of possible stimuli that may become associated with the original stimuli and the vast complexity of anything which deals with human behavior, make the study of concrete cases extremely difficult, although distinctly promising.

Of the motor reactions of the animal to the constantly changing stimuli of the environment Mlle. Dontchef-Dezeuze says:

"Constantly at each minute we may say during the experiments positive active reaction appears with each change of the environment. Each sound, however feeble, supervenes between the constant sounds and noises which surround the animal. Each decrease or increase of these constant sounds, each variation of the intensity of the general illumination, whether the sun is concealed by clouds or a ray of light traverses

them, each subtle increase or decrease of the light of an electric lamp, a shadow which crosses the window, each new odor diffused, a whiff of hot or cold air which reaches the animal, even the slightest caressing of the skin excites the activity of such or such a part of the animal's muscular system. The eyelids, the eyes, the ears, the nostrils, are put in movement. The head, the trunk, and the other parts of the body, are moved or placed in such or such a position, while these movements sometimes are repeated and augmented or sometimes the animal places himself in a definite posture."

When we reflect that the child is quite as sensitive to stimuli as the animal and forms conditioned reflexes even more readily, and that what is true of the impressions from external stimuli is probably true also in greater or less degree of mental impressions, we get a glimpse of the vastness and complexity of the problem of the conditioned reflex in relation to education and hygiene. In the view of Dontchev-Dezeuze, what is true of an auditory stimulus associated with the feeding of a dog is true also for the impression received from any receptor organ. It does not matter what the stimulus is, it may be visual, olfactive, auditory, tactile, thermal, or probably even organic. If such an indifferent stimulus of any modality whatever is associated with the ordinary stimulus it becomes an active agent determining the secretion of saliva. It is only necessary that the indifferent stimulus be presented simultaneously with the ordinary stimulus so that it may become associated with the latter.

If an entirely indifferent stimulus like the mere sound of a bell, or the striking of a certain note can call forth a definite physical reaction like the secretion of a gland, we may well imagine that any mental image or idea and even any attitude or *Einstellung* may in like manner be associated with the ordinary stimulus, become a conditioned stimulus, and call forth a definite physical reaction of a gland or a motor organ. Thus we can see why an individual's mental processes and the various associations formed with a situation or any form of activity may be so significant for the health. The ordinary teaching in regard to mental hygiene is largely vague and indefinite, but this method of approach from the study of the conditioned reflex shows a solid objective foundation for some of the generally accepted doctrines in regard to the effect of the mind upon the body.

The student, however, should remember that the law of association both in its application to mental states and conditioned stimuli is merely a general law, and perforce gives a mere method of approach. Human experience is also infinitely complex on its qualitative side. In studying any concrete case the problem is always an individual one. It is the task of the psychologist to analyze the mental states in question and the

processes involved, and hygiene must often wait for this work of psychology.

The writer may be all wrong in some of the concrete examples given, but the general principles and method suggested are sound. And if the illustrations used suggest a claim to a vast field, it would be far from the writer's intention to suggest that mental hygiene could dispense with the help of psychology and pedagogy. He is well aware that the law of association, even as it appears in the conditioned reflex, bakes us no bread; but it does give an objective method of study of the first importance, and the possibility of its application is obvious when one reflects that not merely the sensation from any receptor organ, but also ideas and probably mental attitudes and affective states as well may be associated with the biologically adequate stimuli as potent factors in the production of conditioned reflexes.

SUMMARY

1. As regards conditioned reflexes we have to note especially the ease with which they are formed in the child and the ease with which they are broken down. This indicates probably that the path of association is established in the gray matter of the cortex.

2. They are not to be identified with ordinary reflexes. They form a group by themselves. The essential thing about them is, as expressed by Hough, "that the connection between afferent and efferent fibres is a path blazed through the nervous substance rather than a definite localized conduction through specialized neurones." (7 p. 411.)

3. Any receptor organ apparently may furnish a conditioned stimulus. In other words, any impression whatever from any receptor organ may become associated with the ordinary unconditioned or biologically adequate stimulus and produce the same result.

4. Theoretically for any motor organ or perhaps any gland one may develop a conditioned reflex.

5. The conditioned reflex is stronger if frequently re-enforced by association with the unconditioned stimulus.

6. The unconditioned reflex in many cases is made stronger by re-enforcement from a conditioned stimulus.

7. In some cases apparently, the ordinary or the unconditioned reflex will not occur unless re-enforced by a conditioned reflex.

8. Many pathological reactions, hysterias, and tics, and the like, are conditioned reflexes.

9. The conditioned reflex may be used as a method to determine a defect of a sensory organ.

10. Education consists largely in the formation of conditioned reflexes.

11. Conditioned reflexes are especially important from the hygienic point of view, some being favorable to health, others unfavorable.

12. Many habits are conditioned reflexes in the initial stage of their development, but the word habit is a loose generic term used to cover all forms of acquired reactions or tendencies to react that are permanent.

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REFLECTIONS OF AN IMMATURE INTRO- SPECTIONIST

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The habit of introspection is not conducive to contentment, however valuable it may be to the psychologist. It brings the self into closer touch with the self; and what the self would seem, on most occasions, to desire is not a first-hand acquaintance with self but a view of self's reflection in the mirror of one's fellow beings. It is what they think of us that gives value to ourselves. And, lacking the looking-glass which others' eyes hold up to us, we turn, more or less naturally, to some clear pool for communion with our own image. Even amid the throng on the sidewalk we do not disdain to halt a moment to study, in the polish of some shop-window, the tilt of our hat, the shapeliness of our ankle, the hang of our skirt, the contour of our bust. We are dualists by nature. We run away from ourselves in the loneliness of our rooms to greet others for their companionship; and when we find it, we inwardly praise or condemn them according as we see or do not see in them the duplicate of ourselves. What is not kin to us, we turn away from as unpleasing if not abhorrent. We love them for having something in common with ourselves; we blame them for disagreeing with ourselves. We like to cultivate not a first-hand acquaintance with ourselves but an acquaintance with our reflections. We desire not introspection but what—if it were permissible—might be termed *extrasppection*.

In the family-circle the case is much the same. Before the circle has expanded to embrace units other than the parents, the wedded couple are each fond of believing the source of their happiness to lie in their differences. Brunette likes blonde. Blue eyes love dark. A nose *retroussé* prefers an *aquiline* beak. A downy chin adores a military whisker. A sanguine temperament delights in the mysteries of melancholy in the beloved. And so on, through the categories of the differences, which when paired, unite into oneness and harmony. Sometimes the attraction of opposites has been so extreme as to bring and hold together individuals of different races: the negro and the white; the Gaul and the Teuton;

the Oriental and the Occidental. This magnetism exerts itself not only through the physical self; there is given it a yet wider demesne for its operation in the mental, the psychical, the spiritual, and in whatever other phases of character are not comprised primarily in form and feature; in color of hair, eye, and skin; in movement and habit of body. Yet the contrasts that delight become a source of discord, the opposites that attract are charged with the dynamic of repulsion, the instant the mystery of attraction is removed. And that attraction is what? It is the power Eve has of showing Adam in herself a reflection of his strength; it is the power Adam possesses of whetting Eve's appetite for the sweetness of her charms. It is with ever renewing pleasure that she braids her hair in the mirror because of the halo of approval he has placed there. It is with increasing satisfaction that he fares forth into the environs of Eden for flesh and fruit and figleaf because of her applauding smile when he lays these bounties at her feet. Matrimony, companionship, social intercourse are refractive media that separate for the eye of self the white light of selfhood into the seven rainbow colors of which selfhood is composed.

Probably this side of the thesis has been given sufficient excogitation for a return to the assertion that introspection is not an agreeable operation. Certainly it is not pleasant at first. Perhaps a taste for it may be acquired, like a taste for olives, or caviar, or beer, or tobacco. Yet—and there would seem to be a negative to every positive—there are some persons born with a natural relish for it as there are some who take to olives or tobacco as a duck takes to water or a bird to the air. For them the act of looking inward is not a perversion. It is a source, sometimes of amusement, sometimes of profit, sometimes of melancholy: the amusement or profit which consists—to borrow Richard Burton's quaint phrase—in the 'anatomy of melancholy;' in, it may be, the physiology of the body, the dissection of a muscle, the paring of a toe-nail, the probing of a sore; in the vivisection of an emotion, the reaction to a kiss, the shock of an insult, the birth of an idea, the parturition of an enthusiasm; in short, in the contemplation of the innumerable unnamed experiences of the soul in its contact with life. It is for most eyes a strain to turn inward; and, when they accomplish the feat, they see only darkness. It is for most hands monstrous to prick their own skins; and when they do so, they tremble at the feel of their own blood.

Perhaps the least profitable exercise in which a healthy mind can indulge is to probe into its inner recesses for the purpose of discovering, if may be, the principles of its mechan-

ism or the laws of its operation. If this is not true on all counts, it would seem to be so on the score of health and comfort. I remember quite vividly an experience of mine some years ago with my physician. I called to consult him about what I took to be my disordered liver. I described my symptoms in answer to his queries; and the final, comprehensive, and clinching interrogatory I was obliged to answer was where I thought my liver was. I placed my hand on the offending region and was much surprised to be told this: "My good fellow, your trouble is not seated in your liver. Patients with derangement of the liver always have sure knowledge of the location of that organ. The liver so unmistakably asserts its presence to them that they not only know they have it but they know where they have it. It cries out loudly and persistently. It domineers over every other member of the body, which all point at it as at an incorrigible offender. And all of its importance is due to the fact that it is sick. It invites attention to itself. It wants to be taken out and cajoled and petted and purged. It is like a baby crying for paregoric."

So said the Doctor of Physic. And his voice comes to me across the years as I sit here trying to put on paper a notation of the things that pass through and possess my soul: my thoughts, my feelings; my miseries, my joys; my despondency, my elation; my mood, my disquietude; my reaction to the stimuli of sense, of food and drink, of companionship and solitude. Is the parallel valid? If, by my lack of knowledge as to the location of my liver, I convinced an honest doctor of my immunity from liver-complaint; could I now, by an all-too-overwhelming consciousness of a pressure upon my soul, convince an alienist of some hypertrophy or enlargement or softening or other deep-seated derangement of the mind? Perhaps so. Perhaps, too, the poet Wordsworth was not wholly wrong in his quaint theory of psychic health that, as the child becomes a man, he develops—along with the other diseases of adolescence—the climacteric distemper of self-consciousness: an affection of the soul which closes in upon him and shuts him out from the kingdom of Heaven whence he came as prison-doors shut in a convict and separate him from the sunlit freedom that formerly was his. How well the prisoner knows that he exists. How much better now than when he roamed the windswept hills can he say, "I think, therefore I am!" Would some wise Doctor of the Soul—would Wordsworth—say to him: "It is precisely to the degree in which you feel the burden of thought weigh upon you that you are ill. The stress of consciousness is the symptom of your disease. You are sick of civilization and education and

learning and logic and analysis and cogitation and—psychology. Eureka! Psychologitis! There is only one thing that will cure you. It is a severe regimen, but it is your last hope: You must, instead of standing and walking erect, go on all fours. And whenever you are prompted to go at anything with the full force and weight of your understanding, you must never yield to the impulse in the old way, but you must approach the matter with your head inverted and your eyes directed upon it through the angle made by your lower extremities!"

This is something of what Hamlet may have meant by his phrase 'sicklied o'er with the pale cast of thought,' and yet Hamlet only adumbrates upon the idea; for while his self-analysis was pre-eminently introspective, it was introspective in respect of a given situation and not in respect of any and all situations that happened to evolve out of the kaleidoscope of events. Hamlet might be termed an expert psychological introspectionist, had he, instead of bothering so passionately about his uncle, his mother, Polonius, and Ophelia, and Laertes,—had he simply sat down with, say, a stop-watch in hand, or some other instrument devised for the compilation of statistics, and kept careful tab on the stream of ideas pouring like a mill-race through his consciousness; had he studied the groundswell, the storm, the ebb, the flow, of his emotions: their character, their strength, their correlation, their concatenation, their causation, occasion, and origin. Thus he should have discovered himself not sicklied o'er with the pale cast of thought but aglow with the rapture of a new discovery in the new psychology; for he should have known that the business of the introspective statistician is not so much to think or to feel as to see how thinking is done and how feeling is achieved. Probably his main objective in dispatching Polonius with a sword through the arras would have been to note the initial quickening, the final flickering and cessation of his own as well as Polonius's pulse-rate, together with perhaps a momentary increase followed by a decline in the peripheral circulation both of himself and his victim. In his final unequal passage at arms with Laertes, he would have been more than commonly interested in the effects of poison not so much upon Laertes as upon himself; its effects upon his own senses and motor-activities; the palsy that crept into his arm, the pictures that projected themselves through his eyes, the dryness of his tongue, the clutch at his heart, before the last spasm of agony sent him lifeless to the floor; and a hundred or more unimaginable experiences, which he alone, in his capacity of introspectionist, could have discovered. In a word, if he was mad, he

would have told the world explicitly that he was so. He would have done more: he would have made a minute—perhaps a meticulous—exposition of why and how he came to be mad and how it felt to him to be so. The carping critic should not cavil at the impossibility of a madman comporting himself like a professional introspectionist; for, as he himself said to Horatio, there are more things in Heaven and earth than a sane man's philosophy—like Horatio's, of course—dreams of. Perhaps, finally, he *was* a professional introspectionist to the limit of his capacity—deprived as he was of the machinery of the psychological laboratory; if so, the fact yet remains to be exploited before a scientific public, and the question of his sanity to be adjudicated from a new angle.

Now, if this could be done for Hamlet, it would be fruitful of a few results of importance: first, it would, in all probability, solve once for all a few vexed literary problems; second, it would, with considerable certainty, make the path of the non-professional introspectionist a little easier to go in. For the achievement would have to be gained without the use of the scientific instruments now employed in the laboratory, as there is nothing now left of Hamlet to weigh or to measure except his ghost or as much of it as has not repaired to that bourn from which no traveler returns; yet that remnant, a considerable one, fortunately, is forever embalmed in the immortal lines he once addressed to those who chanced his way at a time when everything was so rotten in Denmark. Would anyone now, when the scientific spirit has come to dominate thinking, have the hardihood to employ a method of introspection unaided by mechanical devices and uninspired by the desire to plot a series of curves? Hardly; for, in the first place, he would at the outset have to deny that his thinking is thinking; he would have to make the denial on the ground that it is not cerebration; and, in the second place, he would have to assert that his introspection is more than looking inward; for he would have to admit that it is hearing and touching and tasting and smelling inwardly; that, moreover, it is sensing with the deepseated muscles, the bones, their marrow, and with the viscera—the lungs, the heart, the bowels—of the body; that, in addition, it is plumbing the depth of moods such as the doldrums and the mulligrubs; that it is scaling the heights of ecstasies and raptures: that it is, for illustration, soaring into the darker outlying reaches of the soul whence Poe's raven came to perch upon a bust of Pallas; that it is to voyage with Shakespeare from Heaven to earth and from earth to Heaven to give to airy nothing a local habitation and a name, and, after having completed the voyage,

to out-Shakespeare Shakespeare by showing how Shakespeare dit it. Nor would the thorough-going introspectionist remain content herewith. He would aspire to demonstrate by what stages and flights and processes and calculations and measurements and tabulations he acquired possession of his knowledge. He would like to know not only how the egg was hatched and laid and fertilized, how it grew into a chick and then into a hen, but how the primal protoplasm was fertilized and grew into countless forms of life, each with its ghost of soul like to and yet different from the unnamable other ghosts of souls that animate the living clay known as animal life. For through such vast and far-reaching vistas as these even Poe's raven may be supposed to have flown to deliver with more wisdom than a passing glance can discern or even the sciences can disclose, his sepulchral 'Nevermore.'

What, then, can I do with my poor self as I sit here contemplating it? Am I to stop sitting and contemplating, and make the decision on the ground of its unloveliness? Am I to take the stand so often assumed by critics that self-contemplation is a morbid act? What, in that case, is to be made of the well-known advice. 'To thine own self be true, thou canst not then be false to any man'? Or of the still older maxim, 'Know thyself'? Plainly, the precept of altruism has its origin in egotism; and perhaps just as surely it has its end there. For good or ill, every man has a self to cultivate and keep; and when he comes to the point of saying to himself, 'To be or not to be,' he proposes a departure from others no less than from himself. No, the confirmed introspectionist entertains the purpose of serving society by ascertaining—as far as may be—who and what he is and why he is what he is. If his method is wrong, he is not to be relieved of the merit of good intentions. He means well. He is tired of looking into a pool. He is weary of studying his reflection from those who approve or disapprove his appearance and acts. He reads history, ethics, philosophy, religion, and finds there a world of shadows—a criss-cross of reflections against the world from some man or group of men to whom and whose deeds the world has reacted. He would start forward on a new tack.

So he turns his attention self-ward. He does it quietly and calmly. He ensconces himself in his cushioned chair with his feet propped on the back of another chair. It is the easiest attitude he can assume: the attitude most favorable to the free flow of the soul he essays to capture and caress.

It is a chill rainy morning in early September; and that

accounts for the sensation of iciness in the feet and of goose-flesh along his calves, with a succession of spiral shivers originating in the nape of his neck, touching his loins, and huddling in the crevices between his toes. He notes on the fist holding his pencil that the shadows between the knuckles are blue and that the pink of the finger-nails is fading into the same color. He asks himself: Is this myself? Are these hands and feet my hands and feet? Is this gooseflesh my gooseflesh? Or are these members, however much I may esteem them mine, yet alien to myself? Perhaps these are the mere possessions of self, and no more my real being than the breakfast in my stomach or the coin in my pocket. If Tennyson was as much of an introspectionist as he was a poet, he yet, apparently, went as far as he could go when he wrote: 'Closer than breathing, nearer than hands and feet.' I might lose a hand or a foot. In that case should I be any the less myself? It has been said that, years after a foot has been amputated, one may feel, where the member once was, certain sensations as if it were still there. This phenomenon of the severed foot would seem to attest its intimacy to, its inseparability from, its identity with, the self. On the other hand, the fact that I can contemplate it as a thing apart would seem to demonstrate not only its detachability but its essential detachment or separateness. Probably this is one aspect of the duality of my nature.

Morning has passed into high noon, and with it has gone something of its chill. Self, meanwhile, has removed its feet from the chair that supported them, and betaken itself to its hotel for dinner. This self belongs to that stratum of provincial society that takes its dinner in the middle of the day and reserves its lunch for the evening. This is partially a matter of choice; and the choice rests upon the experience that the process of digestion is, on the whole, pleasanter in the afternoon than in the early hours of the night. This self has more satisfaction in a quiet hour or two on a full stomach after the sun has passed the meridian than in a distressed period of protracted length on a gorged maw after nightfall. This may be due to the assertion of atavistic habit: that habit in the ancestral ape who sought his meals and consumed them in the glow of the sun rather than in the gleam of moonlight. If this be true, the self has made an interesting guess; of course, he has no assurance of the validity of his guess. Yet the roast lamb that is in him, together with a boiled potato, a quantity of succotash, and a piece of applepie, minister to his comfort as efficaciously as if he were possessed of complete certitude in this matter. He may owe a good deal of

his attitude of laissez-faire to the gentle stimulus of the iced tea he had for a beverage. His mood is one of contentment. He does not like to turn his eyes toward the glare of the sun in his western window. Nothing of the outside world is now of any importance. He prefers to let his eyelids droop and, folding his hands over his heart, allow that organ and the other organs co-operative with it, free rein in the exercise of their single and confederate functions. He can hear the corpuscles sing as they crowd merrily to the uttermost regions of his body, bearing each its precious burden of nutriment for bone and sinew and nerve and tissue, as the bee carries to the hive its freight of honey for the honeycomb.

After a while there ensued a wave of feeling that threatened to plunge the self into the abyss of the doldrums; and bethinking himself of the imminence of this danger, the self repaired with a companion to a haunt dear to them because removed by nine flights of stairs—by actual count of the stops the elevator may be called upon to make on the way up—from the madding crowd of the thoroughfare. They asked for nothing much and for nothing very expensive. The article served was beer; and it was drunk without anything to eat, in order that it might exert its peculiar effect unneutralized by food. The self acted in the interests of introspection; and the self's companion said she wanted nothing to eat because she did not care to spoil her supper, and because, moreover, in the matter of expenditures she has gradually acquired the habit of graceful acquiescence. After the first glass, which was rather bitter to the taste and which induced a momentary sensation of revulsion, there speedily came a sense of lightness, yes of airiness, as of one resting on a downy cushion; a sense of expansiveness as of inner doors opening and barriers vanishing and walls silently melting away. It was not exhilaration, for there was no ascent into higher regions. It was rather a sinking; and yet it was not that either, for all the environment remained the same. It was somewhat akin to an effortless floating upon the salt billow. It was freedom. It was as if inner rooms long locked against intrusion were being unbolted under the compelling command of an 'Open Sesame,' and all the closed windows of privacy were suddenly flung open to the sun-sifted zephyrs of cloudland. It was a sweeping of hidden corners. It was a brushing away of cobwebs. The pulse quickened. The air tasted cool in the nostrils and the inmost recesses of the lungs; and the eye roamed with rapture over inner uplands where the dews of morning refreshed the grass and the feet of delight skimmed like an electric launch over pools made by clear mountain-springs and glowed to the sweet

sting of their spray. It was as when a man loosens his girdle, casts off his vestments and goes forth with outstretched arms to greet the new day. It was inner nakedness.

It is now several hours since this adventure of the soul, and the shades of the prisonhouse have again settled down to shut out that fictitious heaven. Yet there is no craving for any more of the stimulant—not at present. Nor is there a feeling of shame at puritanical traditions violated; nor yet of disgust for having yielded to a plebeian impulse. There is no vision of a warning finger pointing at a signboard on the shore of Avernus with the inscription, 'That way danger lies.' Rather there is a recollection of a saying attributed to the sainted Lincoln and something to this effect: 'The Lord must love the common people for he made so many of them.' True, it is a perversion of his words to make them read, 'The Lord must love intoxicating drink, for he made so much of it;' and the obvious retort would be some forcible reference of drink to the Devil, with some such scriptural embellishment as, 'Wine is a mocker and strong drink is raging.' The introspectionist has little concern with morals as a bone to gnaw. What he is after is every possible reaction of the psyche to every imaginable experience of life as it is lived, and all is grist that comes to his mill . . . There is no headache; the hand does not tremble; there is no nausea, no unwonted thirst for water; no such desecration of the spirit as calls in its remorse upon the Father of Mercies for pardon and purging. The light from the electric table-lamp lies, as before, upon the old familiar objects, each of which starts an endless train of memories; and the psyche is as inscrutable, as hidden, as mysterious as ever.

Yes, almost as inscrutable as when consciousness takes flight and the curtain of sleep descends upon the senses and wipes out their impressions, is the mystery of the soul. The self remembers perfectly well this morning, and with the distinctness of a present occurrence, the process of preparing for bed and the act of falling asleep. As the gong-like noise of a clock striking the hour in an adjoining room announced the approach of midnight, vague questionings obtruded themselves upon the attention: questionings about the past and its futility; fears about the future and its purpose; a wish to let go of everything past, present, and to come, and to renounce all responsibility even for the change in my pockets and the few possessions placed here and there in the room. Forgetfulness, nothingness—that was the dominating desideratum. Let Destiny have her way? No, rather let Destiny stop pestering me. I would have done with her forever. Not

that Destiny has been unkind, nor that she mightn't be kinder ; but that, on the whole, she has been a coy minx—skittish, moody, perverse, bent upon being cajoled and coaxed and courted. Let Destiny and Opportunity and Foresight and the rest of that brood go to the Devil and let me alone with Chaos, Oblivion, Annihilation. A twinge, perhaps of neuralgia, perhaps of rheumatism, served to remind the self of the vindictiveness of its pursuers, and it sought to exorcise them by repeating, as a wizard goes through his incantations, some old prayers learned years ago for the rhythm of their periods. The memory stuck at a word in the middle of the prayer of St. Chrysostum ; and, as consciousness went groping about in the darkness for the missing link, suddenly yet softly it lost its moorings altogether upon the tide of time and then without warning was submerged in the gulf of nothingness. The whirl of a motor-car and the rattle of glass milkjars beneath my window brought the self to the surface again as suddenly as it had descended into the depths of Lethe ; and the brilliant sunshine prying at a chink in the shutter apprised the mind that the interval had been sleep. Sleep, sleep ! Nature's sweet restorer, balmy sleep ! The self here under consideration has another self—a better half, to use a threadbare witticism—who is very indulgent to him in his sleeping, if not in his waking hours, allowing him to sleep according to his own sweet will, quietly or vociferously as the mood seizes him. He does not—so she informs—snore or emit any of those peculiar ingurgitations and puffings characteristic of the usual order of audible sleepers. He does better than that. He sings and whistles ; doing the one some nights and the other on other nights ; but never, by any chance, doing both the same night ; though my other self has often wondered why not, as, to her way of thinking, a judicious arrangement of singing pieces with whistling pieces and an occasional declamation or brief oration would serve to beguile the tedium of her insomnia, and, with a little careful training such as Svengali gave Trilby, might achieve a notable career in vaudeville or high opera. The self cannot of his own knowledge vouch for these his accomplishments, as he has never heard himself exercise them while in a comatose state, nor so much as dreamed that he could exercise them in that condition. It is probably some form of vocomotor somnambulism which seeks an outlet for inhibitions imposed during those waking periods when all of himself is under the control of his consciousness and conscience.

It may be that these psychic eccentricities are due to gastric irregularities, and they could be avoided or controlled by some scientific attention to diet. It may be that four ounces, instead of two, of pork and beans might induce a superior rendition of *Il Trovatore*; or that a double portion of green corn, with a generous topping of mincepie, might yield a performance of the *Goetterdaemmerung* with full orchestration. The only conceivable obstacle to a full house of auditors is the probability that they should have to assemble at the unwonted hour of one, two, and three after midnight and even then should have to wait in their seats for an uncertain period before the psychic muse had gained sufficient control of its resources to begin. In any case, the music would have to come not so much from a cultivated larynx and diaphragm as from a well modulated liver and a thoroughly trained epigastrium. Perhaps the accomplished parodist of Lord Byron divined more than he knew of this discovery when he wrote, 'Maid of Athens, ere we sever, give, O give me back my liver!' Do the juices of deglutition and digestion spread or clip the wings of the psyche according as they accelerate or retard the processes of assimilation and nutrition? How much of matter in the animal is mind, and how much of mind is in the stomach? Until these questions have been given a more thorough-going investigation, it is more or less futile to dogmatize upon the dominance of the one over the other as opposed schools of philosophy are so fond of doing.

How much of the psyche is memory? How much of it is expectation? How much of it is the creation of sense-impressions from within and from without? The self asking these questions is prompted to the act by certain vivid experiences of his within recent years, and they have been of such a character as to weigh heavily upon his heart. He is of a domestic turn: something of a feline domesticity is ingrained in his soul. He prefers a quiet evening by the glow of his own fireside—or in the warmth of his own radiator—to a game of pinoche in a bar-room or even a very long sitting at the 'movies.' Once he was the happy possessor of a home planned by himself and furnished to his taste, and could indulge freely his inclination for propping up his feet by his own mantel on his own hearth-rug. Thus accommodated, the pages of some favorite master of thought and style looked good to him; and their attraction suffered no abatement when courted through a blue haze arising from a roll of tobacco. A shift of circumstances suddenly made it necessary for him to convert his real estate into cash, wrap up his household goods in excelsior and burlap, transmit them by express and himself by the Twentieth

Century Limited with considerable dispatch from the scenes of his domestic revelry. He thought he would never regret the change; nor does he think now that he ever has. Yet, though he has been just as comfortable elsewhere since then, and, withal, healthier in body and mind, scarcely a day or a night has passed that, for a shorter or a longer period of time—perhaps for only a fleeting second, perhaps for an hour or two—some room of the house that once was his, some angle of the premises there, did not envisage itself before him and cast its spell for better or for worse over the serious matters or the trivialities with which he happened to be occupied. 'We are such stuff as dreams are made on,' and so forth. But must the dreams always be some transcript of the past, or some kaleidoscopic disarrangement of it? Shall the self ever learn to dream of the future in terms of to-morrow?

Is not the proper note of all dreaming struck in these wise lines of Longfellow's?—

Not enjoyment, and not sorrow,
Is our destined end or way;
But to act, that each to-morrow
Find us farther than to-day.

Yes; the to-morrow will find us farther than the to-day has found us—farther along toward that port of no-striving and actual non-existence from which there is no turning around. Is the psyche becalmed, like the Ancient Mariner, beneath a copper sky, his companions corpses and himself growing mad for lack of water to moisten his parched lips? What a situation were that for analysis by the psychiatrist, and still better by the introspectionist. Next to Hamlet, there is—if one may venture so sweeping an assertion—no finer bit of introspection in psychological poetry than Coleridge's here cited.

The soul becalmed! No wind from the past or the future to fill the sails of its craft: the past a jumble of sour memories and the future void either of adventure or the hope of ever reaching a haven any more. Is that a mixed figure? Let it stand. It is a faithful representation of the state of mind expressing it. Why should the icily regular, the splendidly null, forever stand at watch over the gateways of the soul? The rules of rhetoric, logic, art—the principles of anything—may in great measure be only the ordered inhibitions of the self, serving better to hide than to reveal it. What soul that is becalmed, at a standstill, dare confess its condition even to itself? Here is a field for the introspectionist, which, if sedulously cultivated, should yield a crop of diagnosis and prescription sufficient to turn aside many a poor sufferer from

self-depreciation and accusation and despair, and save him from the stages of psychic decline ending in a sanatorium, infirmary, or hospital. Could the Fool of every Lear be throttled before jingling his bells in the face of consciousness, many an asylum for the insane might be turned into a school for aviators or a factory for the production of munitions of war.

But what is it to be becalmed? It is to feel one's own pulse and count the beats for symptoms of heart-failure; it is to gather from the state of one's digestion signs of some vague calamity impending; it is to gain from the chill in one's toes omens of an approaching bronchitis; it is to shift restlessly in one's chair under the oestrus of some momentary cutaneous irritation; it is to start some rhythmic twitch of a muscle which, if left unchecked, will develop a tic douloureux; it is to contemplate one's finger-nails for evidence of a needed manicuring; it is to whittle a stick for a reason similar to that which prompted Tennyson to compose his 'In Memoriam' to Arthur Henry Hallam, finding in the 'dull mechanic exercise' relief from depression; it is to jingle the coin in one's pocket with an inward assurance that all is well in respect of the next meal-ticket, at least; it is to rub one's chin with the mute query as to whether a visit to the barber's may be judiciously postponed another day; it is to study the tips of one's shoes with the resolve to save your dimes by polishing your shoes yourself hereafter; it is to recross one's legs with a sense of accelerated circulation; it is to sigh for no mistress's eyebrow but for better aeration of the lungs; it is aimlessly to note the color of the wallpaper, the figures in the carpet, the outline of your shadow on the floor; it may be to bite your finger-nails, to suck the knob of your cane, to twiddle the corner of your mouth, to rotate your thumbs, to drum on the arm of the chair you happen to be sitting in, to count the palings in the fence opposite your window, to touch every tree and post you pass on your way nowither in particular, to whistle a tune, pick your teeth, squint your eyes, wag your ears, or blow your nose when there is no need for that calisthenic. It may be a hundred or more eccentricities of deportment, all of which, singly and in sum, are sure warnings of your psyche's annoyance, but no certain disclosure of any the slightest part of her true self.

And when you get up in the morning, who can say where your true psyche lingers? You awaken to the rattle of milk-jars in the street; to an altercation of two drunken men on the sidewalk; to the chaffering of sparrows in the gutter; to the booming tread of the cook as she steers her portly bulk

from kitchen to corridor and from corridor to pantry. You move your limbs to ease the kink in your spine and straightway bring them back from a cold region of the sheets to the hollow they had been warming for themselves all night. You wonder whether your physician's advice to take a cold plunge every morning is sound after all. You close your eyes against the blinding patch of sunshine that strikes a glass pitcher containing water and breaks, like the clash of cymbals, upon your naked nerves. You note an assertive movement in your alimentary tract and consider whether, by some process of applied eugenics, the human animal could not evolve an improved production of itself in the matter of alimentation so as to obviate the use of an early riser. You bury your face in the covers but, instead of going to sleep again as you want to, you raise disquieting queries as to the lateness of the hour and ruminate upon the day's work before you. That visit of Jones's yesterday and the answer you promised to mail him to-day fix themselves in your attention. The shopping you have to do between office-hours, the winter's supply of coal you have to order, the revolution in Russia—these and sundry other remnants of your diurnal celebration stir and murmur in your consciousness, and behold the stress of living again lays its heavy hand upon you, as it were, seizes you by the scruff of your pajamas, and you are awake. You take the cold plunge, you survey with dismay the toll of hair your brush and comb have taken from the region of your growing bald spot, you are reminded, as you clean your teeth, that the filling in that troublesome molar of yours will require another visit to the dentist, you gulp your coffee with a feeling of gratitude for its grateful effects, you hie yourself away into the street and join the procession of tramping shoes that hurry off toward the middle of another week.

And you go, careless of whether or not your psyche is going with you; content if she—like your liver, your heart, your stomach—does her work without bothering you; and convinced that if she needs overhauling, it would be better to put yourself in the hands of an expert who will diagnose your case on the basis of comparative psychology rather than upon the basis of that intensive branch of the subject which dubs itself introspection.

MUSICAL EDUCATION

By HARLOW GALE

In estimating the aesthetic value of any work of art, or in comparing the arts among themselves, it will help to clarify our subconscious or implied mental processes if we write out our table of aesthetic ideas and emotions in their relative value order. Not that perhaps any of such tables of art values would altogether agree. But they would doubtless have enough in common to greatly aid a mere verbal dispute. If the disputants took the trouble to trace the genesis and evolution of our instinctive and acquired emotions, they could come to more agreement than the mere catalog of the intuitionists. Something like the following list, then, can help to objectify our latent criterion of art discussions:

A TABLE OF PSYCHOLOGICAL AESTHETIC VALUES

Nobility, grandeur, peace. Purity, serenity, genuineness. Ethical struggle, self-control, victory. Grace, sweetness, loveliness. Love ecstasy, longing, dreamy sadness. Friendship, sympathy, hope. Strength, joy, gladness.	} Imagination Ideas and Emotions of Art
Decoration, embellishment. Accomplishment, success. Imitation, custom, propriety. Novelty, curiosity, excitement. Admiration, praise, beating. Display. Jealousy, passion, revenge.	} Instincts of Nature.

In connection with some such table, let us make a modern psychological application, in terms of the value of the feeling element attached to our ideas instead of the compartmental 'faculty,' of Ruskin's 'Definition of Greatness in Art' in his famous 'Modern Painters:—'That art is greatest which conveys to the mind of the spectator, by any means whatsoever, the greatest number of the greatest ideas; and I call an idea great in proportion as it is received by a higher faculty of the mind, and as it more fully occupies, exercises and exalts the faculty by which it is received.' Applying this practical test

to music, let us recall how the former 'Musical Sense,' which has survived with the old intuitional philosophy as the foundation of even such valuable and stimulating books as Edmund Gurney's *Power of Sound*, has vanished, like the 'Moral Sense,' into many and more tangible components. Thus an analysis of the very complex art of music results in such elements as:

Rhythm, tempo, accent, dynamics, tone quality, melody,
harmony, contrast, similarity, variety, repetition,
biographical and historical associations with the composer
and with the listener,
mutual influence with dancing, painting, poetry and the
drama.

When, now, one comes to compare the teaching of music with the other arts, as literature, e.g., it is distressing to see how the lower aesthetic values preponderate. This condition is due to the teachers of music having learned an instrument rather than the literature of music. As an example, a census of some 500 teachers of music in a city of 300,000 people gave only about twenty per cent. who had become known to a constant attendant at all concerts for many years. And, of these 100 known music teachers, only about twenty had proved that they knew enough good music to give a recital program. This situation, too, where there was the stimulus of a symphony orchestra, a chamber music society, several choral clubs and music schools, and a University department of music. Thus the great mass of teachers, absorbed in the difficulties of their instruments, seldom rose higher in aesthetic emotions than accomplishment.

Such musicians are on the literary plane of elocutionists, displaying themselves and their organs, rather than the higher values of art works. Occasionally, of course, the average music teacher will chance to play a Bach fugue, a Beethoven sonata, a Schubert impromptu, a Chopin waltz, a Schumann *Träumerei*, or a Brahms intermezzo; but this is usually because he was taught a stray art work amid the customary round of studies and display pieces. But even the higher elements in these sporadic good works are not apt to be brought out in comparison with works found and studied on one's own initiative. This elocutionary plane in musicians is further intensified by the commercial motives and values, which should be the least stimulus in art, being more prominent in music than in any of the other arts. Outside of society's triflers with music, the great mass of music students begin to give lessons as soon as possible to pay for their own lessons or for spending money.

Like the older fashioned school and college curriculums, the present musical repertories are still passed down mostly by custom and imitation. While the comparatively narrow range of concert and recital programs shows the tyranny of imitation and tradition, so interesting psychologically, it is depressing in the preponderance of display, curiosity, novelty and accomplishment. Imitation cannot lead to very high emotions. To be sure, literary courses have their somewhat stereotyped 'Whan that Aprille with his shoures soote,' 'She was a vision of delight,' 'Weary of myself and sick of asking,' 'Little thinks in the field yon red-cloaked clown,' 'All's well with the world,' and 'Das Ewig-Weibliche zieht uns hinan.' Yet literary students get vastly wider and higher knowledge of the context of these classics than musical students do of their occasional classic. What a shallow imposter we would brand a teacher of such poetic beauties who had never read and felt the whole works and gamut of Chaucer, Wordsworth, Arnold, Emerson, Browning, and Goethe; and yet how very few teachers of music have a corresponding intimacy with the immortal works of Bach, Beethoven, Schubert, Schumann, Chopin, Brahms and Wagner? Or, with the specialization in the literary forms of the sonnets, lyrics, the drama, and the novel, how many pianists have sat down in the calm hour and lived themselves into the some fifty classic piano sonatas, into the art waltzes from Schubert to Brahms, into the tone-poems from Chopin's preludes and Schumann's Carnival to Liszt's Swiss and Italian Pilgrimage Annals? How many violinists know all the Mozart and Beethoven violin and piano sonatas, or have rejoiced in the finest musical comradeship through the joyous strength of Haydn's 83 string quartets, the heavenly purity of the ten celebrated Mozarts, and the noble greatness of the 17 mighty Beethovens?

Singers and teachers of singing, of all musicians, get and give the least aesthetic musical values. Coming through the display and decoration of the Italian Opera and the cheap sentimentality of Protestant church music, there is little hope for most singers' musical salvation. The type winning the greatest applause and money, like Patti, Caruso, Melba, Amati and Tetrizzini, live so almost exclusively in the pleasures of jealousy, tone quality and dexterity as to be a shocking travesty on all that is lovely, pure, and noble in music. All these shallow theatrical trivialities were eradicated by Wagner and his trainers for the great music dramas, so that such heroic figures as the Vogels, Gura, Materna, Schelper, Lehmann, Burgstaller and Griswold embody the most inspiring struggles and grandeur. When oratorio singers can be subordinated

to an orchestra and such exalting text and music as Bach's two Passions, the Missa Solemnis, Mozart's and Brahms' Requiems, they can perform a high public function. But it is an art tragedy that most singers know so little of the purest song gems which make up a large part of the thousand songs of Schubert, Schumann and Brahms. In efforts to find a singer who could give a Schubert song every Sunday morning for a year, along with some chamber music in a liberal church service, the formerly mentioned 500 music teachers could not furnish a single professional who knew enough Schubert, and the rare function was finally filled by a university woman teacher of literature. One needs no voice teacher at all, only normal lungs and larynx, an enthusiasm for lyric poetry, some imagination, and a sympathetic pianist, to live in the purest romantic joys of 'Die schoene Muellerin,' 'Die Winterreise,' 'Die Dichterliebe,' and 'Die schöne Magelone.' That highest ideal of a song interpreter, Ludwig Wuellner, can be followed by many a lesser man than the late John Fiske, as he sang Schubert by the hour in virile ecstasy.

Another important reason, besides the narrow musical knowledge of most music teachers, why so little of the higher musical components are cultivated, is that even the best educated teachers so seldom discriminate between making performers and making cultivated lovers of music. The overwhelming mass of young people studying music can never be public soloists and should not even be inoculated with the bacillus of showing off in private. But it apparently never occurs to most music teachers to do anything different for their pupils than was done for themselves; i.e., a long course of technical studies and then the laborious mastery of a few repertory pieces and concertos. Instead of thus missing about 95% of our wealth of classical musical literature, it would be vastly better for the teacher, as well as for his pupil, for them to sit down together at the piano and leisurely wander through the original four-hand waltzes of Schubert and Brahms, the exquisite 'Bilder aus Osten' of Schumann, and learn to know through their piano arrangements all the overtures and symphonies of Beethoven. Nothing, also, so helps the necessary facility with a musical instrument and with reading music as the stimulus of good music and the necessity of keeping up, with a better player.

Thus far we have considered music taught by private teachers and schools of music, which together still control the great mass of musical instruction. What music has been introduced into our public school systems is largely of the recreation and busy-work type. While it has the advantage

over privately taught music in not attempting to make soloists or professionals, the public school music is limited primarily by the same very circumscribed cultural musical knowledge of its teachers. Here and there, thus, in the scholars' recreation interludes of singing, they chance upon an eternal folk song or even Brahms' famous cradle song, which will stay with them like Lincoln's Gettysburg speech and Silas Marner. But school singing is mostly the exhilaration of fresh oxygen, social competition, novelty and fleeting pretty sounds.

About the same proportion of musical credits can be given to the instrumental and orchestral playing in grammar and grade schools, only that the novelty of fiddles and horns is greater than vocal chords and lungs. For the social good of enticing boys off the streets and giving more esprit de corps to each school by competition, its orchestra can be a very helpful institution. The best that can be hoped for music itself from their enthusiastic hours of ear-splitting practice, however, is that their awakened curiosity will lead them to the children's, Sunday popular, and regular programs of a symphony orchestra.

By the High School age, singing and orchestral playing can reach much more serious art worth. The 'Messiah,' 'Creation,' and 'St. Paul' have begun to uplift adolescent boys and girls above their home level of clothes, bridge and autos. Schubert's Unfinished Symphony and Mozart overtures have already given a genuine art aim to some High School players, whose private teachers have merely started them on various instruments without any inkling of what music can mean. Yet it is only very lately and in few centers that oratorios and real orchestral music, through exceptionally cultivated teachers, have risen above the entertainment level of the grades.

The college and universities present strange musical anomalies. On the other hand there are two adaptations of the Puritanical idea of education by discipline in the college courses in musical theory and in instrumental practice. Harmony and counterpoint correspond to grammar and philology. They are interesting scientific dissection supplements to a living knowledge of music and literature. With the aid of the historical development of musical theory and of philology, some added interest can be given to the products of their rules. But they should be studied only incidentally, after a large body of classic music and literature is accumulated, for they are not necessary for the highest appreciation of art. The music and theory relation is similar to that of reasoning and logic: we can learn logic only after we have unconsciously learned to reason. The modern psychological realization that

all our higher intellectual and emotional processes grow unconsciously through the associations of experience, rather than by the deductive application of rules, should make teachers most cautious about reversing the mental processes.

College courses in the piano and violin are farther from commercialism and display than in the public schools, and are usually supervised by more cultured teachers. But they are still called courses in the piano and violin instead of courses in Beethoven. And the importance given to technical studies and conventional display pieces, surrounding so few musical classics, shows that the universities inculcate musical discipline rather than distinctly aiming at cultivating the highest aesthetic values. How distressing to see college senior women struggling to get in all the notes of a Schütt, Saint-Saens, or Tschaikowsky concerto, with no idea of their mediocre art value, when they do not know a half dozen of Mendelssohn's lovely Songs Without Words, Schumann's poetic Scenes of Childhood, or Beethoven's kings of sonatas. Then, too, concertos on the whole, except as orchestral works, do not compare with our heritage of sonatas, and they should have little place in the piano and violin literature of amateurs. As the final goal of years of technical practice, a true professional soloist, as an honored guest of a symphony orchestra, can humbly add his instrument to the other orchestral instruments in the co-operative rendition of some score of true art concertos.

In the history of music the colleges may get more grounded than the conservatories in Palestrina, deeper in the forgotten lore of Riemann's ponderous handbook, or even to Wallaschek's Primitive Music, but they do not attempt to cover the classics at first hand as in history and literature. When one knows all his Tennyson and Emerson, Schubert and Beethoven, he needs no literary or musical digest. Besides a personal knowledge of the musical classics, the college historical courses hardly yet lead to such classical biographical and analytical works as Spitta's Bach, Jahn's Mozart, Lenz's, Grove's and Thayer's Beethovens, Glasenapp's Wagner and Kalbeck's Brahms.

Both purposes of the college courses in composition are not of high value. For the technical analysis of musical masterpieces is again of supplementary scientific value, like grammar and philology; it does not add greatly to the aesthetic ensemble. The other purpose of practical exercise in composition for developing composers is a relic of the accomplishment stage, which literature had long relegated to that pretence of literature in rhetoric. While the colleges exercise a most

useful function in producing journalists, editors and critics of soundly grounded taste and a trained facility of expression, really creative poets, essayists, novelists and dramatists are not made by the universities. Even less can composers flourish in an academic atmosphere: witness the tragedy of our greatest American composer, McDowell, in Columbia. What would Browning and Brahms,—kindred spirits,—have created amid the routine of committee work, teaching and lecturing? Even the best of university composers, like Professor C. V. Stanford, of Cambridge, would doubtless have risen far higher had he been free to live alone with nature and a few friends, like the great composers. Thus, without disparaging the conventional compositions of university professors of music as contributing to cultural refinement, they are a wasteful diversion, both for the teacher and his students, from their main study of the great musical triumvirate in the three B's. Fortunately, through the more rapid sifting-out process in music than in literature and painting, the composition exercises of the college are quickly relegated to the silent archives of the music store rooms.

When, now, one comes to reflect how more of the higher art elements can be taught in music, let, first of all, a more distinct line be recognized between making professional performers as soloists, orchestral players and opera singers, on the one hand, and, on the other hand, the teaching of music culturally as one of the arts. For the professional purpose let a few recognized and authorized conservatories of music be licensed, like the Leipzig Conservatory, founded by Mendelssohn. This will eliminate the great mass of private music teachers who have neither worthy professional possibilities nor musical culture. They can well be spared along with 'professors' of dancing, the mandolin, and phrenology. Then, with display and accomplishment, the bane of all music, discouraged or eliminated (if human nature can be so far reformed), the cultural study of musical art should start with a pure and distinct standard, as in literature, at the top of our educational system. Let courses in the piano, violin and singing join the shades of Latin and Greek grammar and the quondam pseudo-scientific microscopy and laboratory technique, and, in their stead, let us study directly the ten great composers from Bach to Brahms. Let historical courses in ethnological and folk music, and in the early church, opera and instrumental music of Italy and France form the prelude and postlude and interstices between the great composers at first hand.

More profitable than cross-cataloged courses in the symphony, opera, or sonata will be chamber music, because more

of the real heart of the great composers has gone into their sonatas for the piano and violin or violincello, into their songs for piano and voice, into trios and quartets for strings alone or with the piano, into quintets and sextets, up to the limit of chamber music in Beethoven's Septet and Schubert's Octet. These most intimate art compositions, written for a few friends and for home use, are the most genuine essence of music. Display and accomplishment are here eliminated together with the soloist; the individual player is subordinated in co-operation for the production of joy, grace, purity and nobility.

The University Musical Societies of Oxford and Cambridge have long played chamber music in little groups among themselves for the townspeople, and exchanged programs between the universities. Instead of ascetically practicing on studies and concertos, why cannot our college men and women be arranged into chamber music groups and learn to know the classics which will be an unspeakable joy, comfort and inspiration a life-long in their homes, just like their beloved books? It will be found that very little preparatory technical instruction or practice is necessary to get right at chamber music. Already an occasional amateur quartet of men has found here, as often in Europe, that they can rapidly pass from a few scales and folk song melodies to Haydn and Mozart piano trios, to their 83 and 27 string quartets, to the dozen Schuberts. Playing together only once a week, in the calm and freshness of Sunday mornings, such a quartet can leisurely learn to know thoroughly in one winter all Schumann's wonderfully romantic three string quartets, his three piano trios, his piano quartet and piano quintet. It may take two winters and summers,—for summer Sundays and evenings are the ideal setting for chamber music,—to thus live into Brahms's three string quartets, three quintets, two sextets, three piano quartets, one quintet and five trios. The end and aim of all music in Beethoven's mighty final pentiad of quartets has thus been known through and through in one year by such an amateur quartet, after it had watched and waited in vain for twenty-five years in Europe and America for public opportunities to learn these highest and last words in all music.

If we never read books any oftener than most music teachers read music, we could hardly get beyond the primer. But there is no special trouble in learning to read music, just as with newspapers, if we simply read. Even if our fingers, bowing arm, or vocal chords cannot keep up to our eyes in getting in all the notes, or in speeding them up to proper tempo, our imaginations can fill out how they all would ideally

sound. To play what you can, keep your place, get in again, and not disturb your colleagues, is the practical amateur technique of chamber music. The stimulus of keeping up with the best player in the group, of synchronizing together in tempo and dynamic expression is vastly more helpful than practicing alone.

When it comes to learning the symphonies, overtures, Wagner, Mozart's operas, and 'Fidelio,' it is hardly possible to get together a college orchestra, unless help for the wind instruments is given by the conservatories. Even then, such tedious practice is necessitated by the poorer and irregular players that far more and better knowledge of orchestral works can be attained through four hand piano arrangements. Thus Professor Stanford has long prepared his Cambridge students for the university orchestral concerts by professionals and amateurs under his own direction. Indeed, *mirabile dictu*, the gaining of real musical culture does not require necessarily the playing of any instrument or singing. By simply listening, and, better still, also following visually the music score, one can gain the same high art elements as in listening to reading aloud in the home circle. To be sure, it requires more repetitions to thus know good music than novels, but hardly more than good poetry.

A most valuable aesthetic component which has hardly yet been included in any university courses, is furnished by the letters and writings of the composers themselves. Prolix and involved as they are, Wagner's prose writings in his ten volumes of *Gesammelte Schriften* are a wonderfully inspiring record of the development and struggle of mighty dramatic ideas and of an indomitable, titanic personality. The text to his music-dramas should be studied, either in the German drama course or in the music department, and compared with their folk-lore forerunners in the Eddas, *Nibelungenlied*, Wolfram's *Parzival* and Gottfried's *Tristan*. Wagner's correspondence with Liszt and other friends and his autobiography should be known at first hand. Beethoven's two volumes of letters picture the turbulence of his intense spirit, its isolation and suspicion through deafness, with also a surprising leaven of culture,—all contributing to the tragedy of his life and its gigantic works. The biographical basis of the incomparable grace and purity of Mozart's music is seen in his lovely letters, just as the most refined spirit of Mendelssohn, as the musical genius of wealth and culture, is shown in his two volumes of letters. Along with the immortal romance of Robert and Elizabeth Browning deserves to stand that of Robert and Clara Schumann. Their journal and let-

ters, which Litzmann has collated in his splendid three volume life of Clara Schumann, show not only the poetic idyl of their twenty years of romantic love and art creation, but are also a fascinating picture of the entire art life of northern Europe during the last seventy years of the 19th century. Robert Schumann's *Jugendbriefe* and his *Neue Folge* radiate a poetic sparkle and manly vigor of the highest literary value; while the rhapsodic pictures of his contemporaries and the generous sympathy with all sincere art strivings, in the two volumes of his *Gesammelte Schriften*, give him an immortal place as the greatest word-poet, as well as tone-poet, among all composers. The interwoven lives of Joachim and Brahms with the Schumanns, and the seven volumes of Brahms' letters with the Herzogenbergs, Joachim and others, show the finer, deeper, and more intimate art elements, which were sadly wanting in the crude theatrical grandeur of the Wagnerites. Such letters as those of the famous Vienna surgeon, Dr. Billroth, who built a palatial music room in his own villa to honor Brahms' chamber music and who learned to play the viola therein, are an ecstatic idealization of the aristocratic art patrons of Haydn's and Beethoven's times.

All such sources, rounding out and co-ordinating the art values of musical classics, thus demand the founding and encouraging, in universities and homes, of musical libraries. Not one professional in hundreds has any idea of a library of music beyond a few stray, torn leaves of 'sheet music.' What an illuminating contrast it was to find in the King's College don's rooms of Oscar Browning (the friend and biographer of George Eliot, with her joy in Beethoven sonatas and her grand piano) a special room for his grand piano and library of music adjoining his room of histories from floor to ceiling. Many a cultured home, however, which treasures and uses its complete library sets of Shakespeare, Goethe, Molière, Ibsen, Thackeray, George Eliot, Ruskin, Tennyson, and Arnold. can similarly know, honor and love music by possessing the main or complete works of Bach, Haydn, Mozart, Beethoven, Schubert, Schumann, Mendelssohn, Chopin, Wagner, and Brahms. Besides this first rank, in which the mighty Beethoven towers alone, much delightful companionship will be found in the lyric piano works, two piano and violin sonatas, string quartet and some songs of Grieg; in some of the symphonic poems, smaller piano works, and songs of Liszt; in the earnest and ascetic Caesar Franck; in the piano trios of Gade; and in a small proportion of the songs of Franz and Wolff. After a thorough saturation in the best music in one's library, then one can safely browse about in concerts or public libraries,

and try whether there is anything worth taking home from the pathological melancholy and mania of Tschaiikowsky, the bizarre novelty of Rimsky-Korsakoff, Ipollitow-Iwanow and Korngold, the cheerful commonplace of Reissiger, Reinecke, Jadassohn and Sitt, and the emasculated meanderings of Debussy.

Another very important point in musical education is the distinct realization that the highest function of public concerts, after all, is to educate their hearers to revive the music at home through their own copies, either by playing at it or reading it silently. This education by concerts to not needing concerts, while it will be wholesomely depressing to the pride of concert soloists and conductors, is similar to the highest cultural value of Shakespeare, Goethe and Isben through their copies in the home, rather than through the elocution and stage effects of actors. After hearing and seeing musical and dramatic classics given in artistic productions, one can easily learn to carry over in imagination these auditory and visual elements to the intellectual reading of the classics at home. Then, and not till then, do the classics become our real friends and inspirations to everything loveliest and best in this world.

Having established the aims and methods of cultivating the higher values of music in universities, the practical pedagogical problem is to adapt these same aims and methods to the high schools. The singing of Schubert, Schumann, Mendelssohn and Brahms songs for single voice, women's or men's voices, or both, and the playing of chamber music, should be the main aim. Oratorios and orchestras can but rarely compete with these smaller and more adaptable groups of boys and girls. Whether any musical instruction should be attempted in the grade schools is a debatable question. As children can begin their literary education on Scott and Dickens, without wasting any years on ephemeral and cheap children's literature, so can they begin on the simplest and best music. If we had any worthy heritage of folk songs, that would be very worth while in the schools. Until the age of adolescence and its awakened imagination there is no serious call for musical expression; below that is the naive play of primitive instinct.

After all, like the other arts, music is for adults rather than for children. Moreover, it is for men more than for women. Not only is the masculine psychology more fitted to create original music and interpret music, but also to cultivate its higher elements in the home. In the older musical centers of Europe it is the men who make the music: the women listen and crochet. Instead of magnifying the feminine graces

of music, valuable and indispensable as they are, we should emphasize *music for men*.

SUMMARY

1. The lower educational art values of music, compared with literature are due:
 - a. To the extremely limited musical knowledge of teachers.
 - b. To the teaching of the instrument rather than the classics of music.
 - c. To teachers learning music largely through imitation.
 - d. To the wearisome struggle to maintain school and college orchestras rather than chamber music combinations.
 - e. To the survival of discipline in instrumental practice and theoretical courses.
 - f. To the vain hope of colleges discovering or making composers.
2. The teaching of music can be bettered by more application of the methods of teaching literature:
 - a. Suppress the hoard of private music teachers and discourage music as a business.
 - b. Separate the making of professional musicians from musical culture.
 - c. Relegate the production of professional soloists, chorus singers, and orchestral players to authorized conservatories of music.
 - d. Incorporate the cultural teaching of music into our high schools and colleges.
 - e. Teach the musical classics and their composers instead of the instruments
 - f. Cultivate chamber music more than all other forms together, by small groups of students playing in combinations of duets, trios and quartets, and in hearing each other, their teachers' or professional quartets.
 - g. Give courses in the texts to Wagner's works, in the lyrics to songs, and in the literary writings and letters of the composers.
 - h. Teach by example and precept the collection and use of music libraries.
 - i. Show that the highest function of music is in the home rather than in the concert hall.
 - j. Music for adults and especially for men.

STEALING FRUIT AND DECEIVING THE TEACHER

By AMY E. TANNER, Clark University

The following opinions of children were obtained under the auspices of the Public Education Association of Worcester in order to give a vantage point from which to modify the children's attitude. The principals of two of the public schools, who were on the Committee, kindly opened their schools to the study in the belief that the children are representative of the city children in general.

The following situations were presented to the children:

1. Every day when John went home from school he passed by a house that had a large yard with apple trees in it. John liked apples and so he used to go in and take as many as he wanted. If you owned the apples and saw John taking them, what would you do to him?

2. One day when Mary thought the teacher was not looking, she whispered in school. The teacher heard her and saw her and asked her, 'Mary, did you whisper just now?' Mary said, 'No Miss——, I did not.' If you were the teacher, how would you make Mary sorry that she had told a lie?

3. When examination time came Charlie could not do one of the examples in arithmetic, but he saw it on another boy's paper and copied it onto his own and gave it to the teacher. But the teacher knew that he had copied. If you were the teacher, what would you do to Charlie.

These questions were presented to the children by the writer, being read from the paper so that the wording should be entirely uniform, and given to all the children in one school on the same morning, between 9 and 10:30, so that there was no opportunity for discussion together by the children. All children answered them, the teacher of the room was always present and in some rooms the principal as well. The writer recognizes fully that answers under these conditions do not represent the child's *natural* reaction to the situations presented, but are a mixture of various factors, of which the two most important are the punishments he himself has received for such offenses, either at home or school, with perhaps an element of writing an answer to please the teacher. That is, they are in large measure the reflection of the moral stand-

ards of the adults who deal with the child, on the one side, and on the other, of the degree to which he himself has assimilated those standards.

In classifying the papers, the very few children below 8 and above 14 years were omitted, giving for the final returns, a total of 528 children, 270 boys and 258 girls, fairly equally distributed between 8 and 13 years inclusive, with only a few of 14 years.

The returns from the two schools and also from the boys and girls were kept separate, for purposes of comparison.

The reactions to stealing the apples show in percentages a considerable number of nearly equal classes, as follows:

Reactions	SCHOOL D		SCHOOL A	
	Boys	Girls	Boys	Girls
Tell not to take.....	15%	17 4/5%	15%	30%
Chase away	15 3/5	9	3	2
Tell or ask to go away.....	10	15	3	2
Whip, strike, shake or spank....	12	8	9	1
Arrest.	13	4	12	3
Reproach, scold or threaten.....	4	5	10	19
Tell offender's parents.....	6	15	8	6
Tell to ask permission.....	3	6	18	13
Let him have them.....	4	7	5	4
Let him have a few or one.....	2	0 3/5	2	1
Fine.	4	0	0	0
Miscellaneous.	9	16	10	12

The most noticeable thing about these reactions is that a considerable number of them are not punishments at all, viz., telling John not to take the apples, asking him to go away, telling him to ask permission before taking them. These three together make up 28% of the D school boys, and 38 4/5% of the girls; 36% of the A school boys and 45% of the girls. Arrest and the various forms of moral suasion and of corporal punishment, including a report to the offender's parents, amount to 35% of the D school boys and 37% of the girls; 39% of the A school boys and 31% of the girls. An average of about 6% of all the children would even give the boy all he wants or some, that is, would encourage him to repeat his act.

Does it not seem altogether probable that this variety in the methods of dealing with stealing fruit is simply a reflection of the attitude of the home, and to some extent of the school? In a study made some years ago it was found that out of nearly a hundred professors, teachers and college students, approximately thirty of each, nearly every one remembered stealing fruit, melons, etc., when a boy, and none of them even when grown considered it very serious. Most of us look with a cer-

tain degree of toleration if not amusement on the pillaging of our neighbor's orchard. On the other hand we find person after person in Worcester as well as elsewhere testifying to the fact that after vain attempts to secure some fruit from his own trees or vines, he has cut them down. Not infrequently a certain tree is carefully guarded, but is pillaged just when the owner is ready to gather the fruit. Sometimes a state of war exists during the entire fruit season between an owner and the neighborhood boys, while in other cases the owner rather unsuccessfully attempts propitiation by giving to anyone who asks. In this case he is likely to get several requests a day, older children sending younger to make the request. So well do boys understand that the general public will not intervene that in one known case, school boys going home at noon would jump a hedge about a foot and a half high, shake the trees and gather the pears and apples in the sight of dozens of people, for the most part men going home for their nooning.

The writer has just learned of one instance of bargaining which throws an interesting light upon the property sense of some boys. One resident was about to leave his house shut for a number of weeks, and in an endeavor to save for himself some of his fine pears, he managed to assemble several of the boys of the neighborhood, told them he was going away, and asked them if they did not think it would be fair for them to leave one of his trees untouched and protect it from other boys if they themselves had all the fruit from the other two trees. They thought it would be about fair, and kept the bargain. The suggestive thing of course is their assumption that they had some sort of right to the fruit.

The reactions to Mary's lie are as follows, the children being asked what they would do if they were the teacher, to make Mary sorry she had told the lie.

Reactions	SCHOOL D		SCHOOL A	
	Boys	Girls	Boys	Girls
Reproach.	15½%	18%	13%	28%
Scold.	9	12	7	6
Shame before class.	7½	13	5	10
Make admit the lie.	6	7	4	2
Keep after school.	9	14	15	15
Tell parents	7	6	15	4
Whip, strike or spank.	9	11	6	2
"Punish"	8	1	2	8
Rattan or ruler.	4	3	4	4
Send out of room.	2	3	7	4
Send to principal.	4	3	1	0
Miscellaneous.	13	9	15	15
Obscure.	3½	0	4	3

If we put together the various forms of suasion, reproach, scolding, shaming, forcing confession, and perhaps sending out of the room, we find that it includes, of the D school children, 40% of the boys and 53% of the girls; of the A school children, 36% of the boys and 48% of the girls. The word 'punish' is probably a euphemistic term for a whipping, and if we include this and the use of the rattan with the other physical punishments, we find that at school D 21% of the boys and 15% of the girls would use it, while at school A, 12% of the boys and 14% of the girls would do so.

The miscellaneous forms of punishment would in many instances fall under the general head of suasion.

The tone of the papers that fall into these two classes is interesting. Often the child makes it very vivid: 'Why, Mary, how could you tell me a lie?' 'Don't you know God won't love you if you do that?' 'How can anyone love you if you tell lies?' At the same time, it seems evident that the children do not feel the offense to be so very flagrant, and here too the variety of punishments seems to indicate that neither at home nor school is there any one kind of treatment of lies that is generally followed.

The reactions to the third problem, the boy who cheated in examination, are as follows.

Punishment	SCHOOL D		SCHOOL A	
	Boys	Girls	Boys	Girls
Throw the paper away, mark it zero or below passing.....	31%	36%	53%	54%
Not count that example.....	3	2	1	10
Do other examples.....	7½	11	13	11
Do others after school	3½	6	1	3
Lower his mark.....	3	2	3	1
Keep after school.....	2	2/5	1	4
Scold.	4	4	2	0
Reproach.	5	3	7	5
Whip, strike or spank.....	16	14	5	4
Rattan.	3½	4	0	0
"Punish"	2	4	0	0
Tell parents	1	2½	0	0
Tell principal	2	2	1	2
Give another chance.....	2	3/5	0	0
Miscellaneous.	11	11	12	17
Obscure.	2	0	0	0

Here the most suggestive thing is the large proportion of children in both schools who would throw out the entire paper because the boy got help on one example. It seems evident that teachers have rather a uniform way of reacting to this particular offense, and many of the children's papers bring this vividly before one. 'I would tear up his paper into little

bits and throws it into the waste basket,' is a not uncommon form of expression. When the question was raised as to whether it is not rather severe to give no credit on the entire paper when there is cheating only on one example, the response from one principal was very prompt: 'But this is the kind of punishment given both by high school and college, unless indeed the pupil is expelled, and the child must learn what to expect.'

But when we consider that only a small percent of these children will graduate from high school and a much smaller number from college, we might question whether this form of deception and Mary's lie should not be put together with other things under the general head of deception, and fought all along the line, systematically, in school, with certain definite penalties that will be the same always and that will be inevitable. To some of us, lies like Mary's seem fraught with more possibilities of social harm than cheating in examination. Very few of us have examinations after finishing school, but all of us have constantly temptations like Mary's, to lie when we are unexpectedly caught in wrong doing. Ought not the school to combat the lie as such with more diligence, and not attach such undue significance to a situation which the school itself creates and which rarely occurs outside of school?

It was thought that characteristic differences would appear between the two schools, because one of them has some 30% of children whose parents are foreign born, and perhaps an equal number whose grandparents were, while the other has very few children with foreign born parents. For instance, we note that 15 and 9% of the D school children would chase away the thief as against 3 and 2% of the A school, while 18 and 13% of the A school children would give him the apples if he would ask, as against 3 and 6% of the D school children. That is, the D school children, coming as a rule from poorer homes than the A school children, would defend their fruit more vigorously and would be less likely to give it away than the others would. They would also tend less to suasion in this case, while in the case of Mary's lie, they would use it to about the same degree as the others. In all three problems they resort to corporal punishment more than the A children, most in the cheating, second in the stealing and least in the lying. Even if one did not know beforehand, one would infer that the children of D school come from homes that, on the average, are more primitive in their ideas of punishment than the homes of the A school children.

Few sex differences appear that seem significant, unless it is that few girls would arrest the thief as compared with the

boys. Smaller percentages of girls than boys would inflict corporal punishment on the thief, but on the other hand, nearly equal percents of both sexes would use it on Mary, and on cheating Charlie.

Nor was it possible to trace any significant changes in the character of the punishments with increasing age from 8 to 14 years, though doubtless there are such differences. The number of children of each age was too small to make it worth while to consider this problem here.

THE PSYCHOLOGY OF THE TEACHER: AN INTRODUCTORY STUDY

BY MARTIN LUTHER REYMERT

INTRODUCTION

This study has grown organically out of my Norwegian work in child psychology (50, 51). In going over the international literature which had more or less direct bearing upon my problems I was frequently confronted with the remark: "This result is probably due to the influence of the teacher." In my own work also I very soon found it necessary to seek refuge in this mysterious sesame whenever I attempted an explanation, and special statistical and psychological data failed to solve the problem in hand. The fact (witnessed by all studies from all countries of children's ideals) that by far the greater part of the children gain their ideals from the curriculum, and the relation of this to the results of recent studies on imitation and suggestion,¹ indicated to me that the problem of the rôle of the teacher was one which stood in need of immediate investigation by all available means and methods.

Since educational psychology has concerned itself chiefly with the child in school, it has naturally happened now and then that the problem has been touched indirectly, as for instance in the investigations of Meumann, Friedrich, Lobsien, Goddard, Richter, Brandel, and others in the subjects of children's ideals, their interest in the different school subjects, etc. Meumann (43, p. 291) stresses the rôle of the teacher in this indirect fashion when he says that "studies on children's ideals" also "furnish a valuable means by which we may judge our whole educational system."

We do not know, however, precisely (or even approximately) how much credit we must give to the teacher in all these mass investigations. The scientific study of the child, whether by clinical psychology, by quantitative measurements of the school work, or by the great and promising work of general experimental psychology (1, 2, 5, 9, 22, 42, 43) has, generally speaking, only been able to open up questions as to

¹See Burnham, W. H., *Bibliographies on experimental pedagogy*, Pub. of Clark Univ. Library. 1912, vol. 3, pp. 23, 27.

the actual rôle of the teacher. These questions are constantly growing in number, however, and some essential ones repeat themselves over and over, so that we evidently must try to attack them more directly and thereby get suggestions and results which will enable us to check our findings in child study. The study of the child has had industrious workers for many decades, and, gradually refining its methods, has spread to all countries. With the rapid tempo of modern inductive science it has already created an abundance of literature. Differentiating itself into numerous branches, it long ago passed the stage at which one man can master the whole field. A writer in Monroe's Cyclopaedia finds it difficult to determine what in modern times shall be included in the term "educational psychology" so complex is already the situation. Child psychology, properly conducted, was long ago recognized as a branch of applied psychology. Well-equipped laboratories, headed by noted psychologists, are established in many countries.

With this general background, it is indeed an astonishing fact that no one has yet tried to study in any exhaustive and systematic way and in as direct fashion as is possible a factor so closely related to the child's environment as the teacher. This lack besides the often necessarily (and often unnecessarily) crude methods is certainly a main reason why child study has been somewhat in discredit among psychologists in general. Thus we see, for example, that Dr. Judd (34) takes precisely this defect as a reason for distrusting child study. He says: "Did you never wonder why, in this age when we are studying so eagerly all the factors in the educational situation, no one has ever undertaken an exhaustive study of the teacher?" And further: "We take up psychology and sociology, but we do not seem to have waked up to the fact that bad order in our classes is sometimes a problem in *teacher study* instead of child study." In his excellent textbook Claparède (14) says: "Given a group of children to bring up, to instruct, what is the attitude that it is desirable the teacher take on coming face to face with them, what ought to be the character of the teacher? What are the temperaments which are the most suitable for the pedagogic vocation?" He is forced, however, to content himself with assigning the psychology of the master as a branch of psychotechnics; the paucity here of his uniformly excellent bibliography is further evidence of the necessity for further detailed research on this problem. The bibliography of the United States Bureau of Education for 1910-11 (71) contains 1910 titles of which only 0.8% have a direct bearing on the teacher,

and of these nearly all are theoretical treatments. In the Psychological Index for 1915 only four or five titles are directly concerned with the teacher.

All this serves to illustrate the situation. In searching the literature for possible experimental attacks on the problem of the personal equation of the teacher, I find that Dr. G. Stanley Hall was the first to have fixed the problem, and that as early as 1896 he had directed his students' attention to it. In "Adolescence" (27, p. 387) he mentions the questionnaire studies of Small (60), Kratz (37), and Sanford Bell (6). Among these Sanford Bell's seem to be the most exhaustive and to give the best indications. The next study is one undertaken in 1900 by Deahl (16). His material, however, is in a shape which makes it very difficult to get any definite results from it. (One of his results seems to be that pupils are least influenced by teachers at the high school age, which is in direct opposition to Sanford Bell's as well as to my own findings.)

A later study is reported by Book (8). One thousand sixty-seven senior high school students wrote compositions on "High School Education" including the point "some sympathetic (or unsympathetic) teachers I have had." The main outcome was: The favorite teacher understands boys and girls, and is enthusiastic, energetic, and mentally young, is interested in his work and has good scholarship without being a narrow specialist. No sex, and no physical appearance preferences were shown. The study is very suggestive, and gives many practical hints, but deals naturally with generalities. We may also mention a quantitative study by Thorndike (67), bearing on the sex of the teacher as a possible influence on the enrollment of boys in the public schools. The value of a quantitative study of such a fleeting factor among a multitude of others of probably greater influence seems very problematic, and his results turn out to be negative.

In 1910, with the study of Ruediger and Strayer (54) in this country, we find for the first time in the literature of experimental pedagogy a work offering an objective method for rating the influence and efficiency of elementary teachers from the point of view of supervision. These investigators asked a number of principals and superintendents to rank their teachers (from 26 schools in all) in certain specific respects. It suffices here to mention that discipline stands first in the ratings of these school authorities, followed by "teaching method," initiative or originality, etc. Later appeared similar studies by A. C. Boyse (12), Miss Moses (44), Littler (40), and finally another by Boyse (11) in which he

offers an estimation blank, compiled from empirical data, for the purpose of estimating the teacher's efficiency on 45 points. Each point is carefully defined, to avoid the use of terms in different senses by the different raters. This plan offers many promising indications for future "standardised" blanks, from which students of education can draw an abundance of material concerning the comparative traits in good teachers for different grades. However, as Boyse points out, the work of standardisation is a very complex and difficult matter, and it is our opinion that numerous special investigations as to the reactions of the child to different traits in the teacher must be instituted and their results brought into relation before any final standardisation is undertaken.

The only studies in French literature dealing with the problem of the teacher that I have discovered are one by Claparede on what pupils think of their masters, and a small but significant one by Joncheere (33). After he had been acquainted with the new class in his normal school for two months he questioned every pupil in a personal interview to discover the reason why he entered the school. It turned out that not a single one had done so out of a real interest in the vocation. The materialistic advantages of the profession were the chief motives. This is indeed an enlightening and fundamental contribution as a background for future investigations of the personality of the teacher.

In Germany the work of J. Dück (20) marks an interesting and practical approach to the circle of problems contemplated in our investigation. In Scandinavian countries no direct experimental attack is to be found. There are, however, in all countries, many valuable statements as to the influence of the teacher on the basis of long teaching experience or from general psychological observation scattered through books and periodicals. As excellent examples may be mentioned those of Jerusalem (31, 32) and H. Gaudig (25, 26) in Germany, and of Nils Hertzberg (29) in Norway. Perhaps even more valuable counsel on the basis of a similarly general background is to be found in the American works of William James (30), Münsterberg (46), and Hall (27, 28).²

This brief review of the present status of our problem we may summarise as follows: The study of the teacher has with the exception of a very few experimental studies been very much neglected. Such studies are, however, of paramount

²As a good background for coming studies in regard to the teacher in this country I would deem it very fruitful to read Dr. Hall's description of the good and bad aspects of the pedagogical situation (28, vol. I. Introduction).

importance in the study of the school child; in fact, they are a *conditio sine qua non* for a large number of problems in child study. They open up a vast and exceedingly complex field for investigation which will demand the co-operation of students in all branches of pedagogical science. It is for the purpose of getting a rough outlook over this field, and for throwing into relief the essential questions which demand immediate investigation, that the present questionnaire study has been undertaken.

Some Remarks on the Method.—The questionnaire method has lately been severely criticized by many noted psychologists. It must be admitted that much of the criticism—when we consider the way in which some questionnaire studies have been conducted—has been more than justified. G. E. Müller calls it “the method of reminiscence.” A French psychologist terms it “La methode democratique.” Professor Jastrow at the annual meeting of “The American Association for the Advancement of Science,” 1916, said: “Many of us think it belongs to the devil.” However, we can understand that psychologists dealing chiefly with pure science will find the method of no value for them. What, however, is more difficult to understand is that an *educational* psychologist like Thorndike (66) after a thorough discussion of the method, in an entire chapter, seems to reach the final conclusion that it, generally speaking, ought to be entirely abandoned. While we can fully agree with much of his criticism, and appreciate the constructive factors in it, we can not agree with his conclusion. Much better do we in this connection understand Claparede (14) and William Stern. Stern (63, Chapter VIII) also at the outset condemned questionnaires, but he later changed his view to the effect, that for certain problems, properly conducted, the method was, although a rough one, permissible. Thorndike, speaking of questionnaires (66, Chapter IX), offers the following program for the future work: “It is to be hoped, that if an equal amount of genius and effort is spent in the next decade upon similar problems, the work will be done by means of *direct expert observation*, of *representative cases*, with reference to *all the factors involved*,³ and

³The most impressive work in analytical science, which tries to take “all factors involved” into consideration I have met, is G. E. Müller, “Zur Analyse der Gedächtnisstätigkeit und des Vorstellungsverlaufes.” *Zeit. f. Psych. u. Phys. der Sinnesorgane.*” *Erg. B. V.*, and with which I have been made familiar through Dr. Baird’s Journal Club at Clark University. However, to gain such a gigantic outlook over a situation is probably not given to one man in thousands. In educational psychology, where we are at the mere start, we shall have to be humble for a long time to come.

with a moderate amount of statistical care." This exceedingly voluminous phrase (which also has crept into Monroe's Cyclopaedia) does not take us very far. Experts are very few.

"Representative cases" in the educational situation of to-day are hard to find; and do not bring out the particular needs, as do the special investigations. It is too early to deal with generalities in experimental pedagogy. We started out that way. Now is the time to gather masses of special facts—and correlate them slowly, as we go along. Where is the genius to take *all* factors involved into consideration! While generally speaking we may say, that in all inductive science, discussion of method may be of more importance than discussion of results, we think it most sane and safe to take the view of Dr. Hall, that method can not be discussed *on a general basis*, and that a method is permissible, when *properly conducted*, it suits its purpose. In spite of clinical child psychology, in spite of quantitative educational measurements, etc., we are not in pedagogical psychology out of the stage at which we need questionnaire studies. Let us use all methods, and correlate the results.

For my purpose the following questionnaire was prepared and submitted:

THE GOOD AND BAD TEACHER

The undersigned desires to ascertain from the memories of adults what qualities made teachers favorite and what made them disliked. Will you kindly answer the following questions, numbering them in your paper as they are numbered below, and the fuller and more detailed your reply, the better.

Please think over very carefully before selecting your teachers as good or bad, and please at the end add any other traits or suggestions that occur to you, and that may help this study. Can you outline your ideal of a teacher in person, etc.? How much has physique, good looks, manners, complexion, physical strength, to do with it; and do moral and do religious traits play any role? Please especially speak of the teacher's influence upon you outside the school.

- I. Please recall the best teacher that you ever had.
 - a. Was this a man or a woman?
 - b. How old was this teacher? Give age as near as possible.
 - c. How old were you when you had this teacher?
 - d. Was it the personality or the methods (or both) employed by this teacher that caused you to like him or her?
 - e. If through his or her teaching, in which subject or subjects?
- II. State in as few words as possible what you remember as to the following:
 - a. This teacher's general appearance (physical, dress, neatness, etc.).
 - b. The quality of his or her voice.
 - c. Enthusiasm—optimism.
 - d. Serious or jovial or changeable in nature.
 - e. Was he or she self-controlled? In what way did it appear?

- f. Was he or she "bookish" or did this teacher bring you in touch with life? Enthusiastic specialist?
- g. Was this teacher strict in discipline?
- h. What kind of punishments did this teacher use?
- i. Had you the feeling of being specially favored? In what respect?
- j. Did this teacher visit the homes of the pupils? What were this teacher's social activities with the children outside of the school?
- k. What was the highest ideal this teacher held up before you?
- l. Has this teacher's influence been of real value to you in your later life, if so in what way?
- m. Have your methods and general teaching management been influenced by (him or her)? If you are going to teach, do you think that they will?

III. Please recall the worst teacher that you ever had.

- a. Was this teacher a man or woman?
- b. How old was this teacher? Give age as near as possible.
- c. How old were you when you had this teacher?
- d. Was it the personality or the methods employed that caused you to dislike her or him?
- e. If through teaching, in which subject or subjects?

IV. State in as few words as possible what you remember as to the following:

- a. This teacher's general appearance.
- b. The quality of his or her voice.
- c. Enthusiasm or optimism.
- d. Serious or jovial or changeable in nature?
- e. Was this teacher self-controlled? In what way was self-control lacking?
- f. Was this teacher "bookish," or did he bring you in touch with life?
- g. Was he or she strict in discipline?
- h. What kind of punishments did this teacher use?
- i. Had you the feeling of being specially misused, or what was this teacher's sense of justice?
- j. Did this teacher visit the homes of the pupils?
- k. Did this teacher hold up any ideal for you?
- l. Has this teacher's influence had any bearing on your later life? If so, in what way?
- m. Have your methods and general teaching management been influenced by this teacher as a negative ideal? If you are going to teach, what do you think will be the bearing of this teacher?

Kindly send replies to Martin L. Reymert.

(Notice. Your paper will be read only by me. Your sex and age?)
Clark University, Worcester, Mass., December 21, 1916.

Seven hundred and fourteen returns in all were received, 370 on the good, and 344 on the bad teacher. I am greatly indebted to the following institutions for taking a great interest in, and helping this study along, by sending returns; above all, the Massachusetts State Normal School (Worcester, Mass.), from which the majority of returns were obtained;

Ohio University, Boston University, Brown University, Rhode Island; Alma College, Michigan; Bethel College, Kentucky; Leland Stanford Junior University, California; State Teachers College, Colorado; Colorado College, Colorado Springs; Buena Vista College, Iowa; Baldwin-Wallace College, Ohio; Alleghany College, Pennsylvania; University of Arkansas; Texas Christian University.

The variety of places from which answers have been obtained is a valuable factor in eliminating the possible uniformity in training and experience of the young people belonging to one special institution. The questionnaires were given to the pupils to take home for careful consideration. Afterwards the answers were delivered at school. In one case the returns were given as regular composition work in school. I have reasons to believe that the answers have not been read by the collectors, so that the factor of full anonymity, which for instance, Trüper has advocated over and over again for questionnaire studies, has been complied with. The median age for the young men and women, giving the returns, is 20, so that one will have to take the psyche at this age into consideration throughout the study. All answers give full evidence of sincerity and interest from the side of the young, and they all seem to have a vivid recollection of a good and a bad teacher. Some have even portrayed their liked and disliked teacher so minutely and extensively, that often *one* single return, would make a small book.

By letting the questionnaire also have a bearing upon the bad teacher, it was the intention to get returns by which we could be able to check our results as to the *good* teacher, in whom we naturally are primarily interested.

In going over the answers, it appeared that some of the questions might have been given a better form. However, as this study is meant to be chiefly *suggestive* and *programmatical*, this fact has not had very much practical significance. As to the often mentioned source of error in such studies, viz., that the questions in themselves suggest certain definite answers, I have the general impression that all of the 20-year-old people have given straightforward answers, omitting answers on points where their actual memory was not clear. All students have answered the particular question, in all cases, where results are given in percent, and no remark to the contrary is made.

THE SEX OF THE TEACHER

Much has been written about the relative proportion of women and men teachers in this country, and warnings have

been given as to the constantly increasing number of female teachers in the common schools. But as Dr. Strayer (64) says: "Up to the present time no conclusive evidence has been produced as to the relative efficiency of men and women teachers." Our study here naturally does not intend to give any definite results, but it is to be hoped that it will help to shed some valuable light upon the question.

Dr. Elliot (21) gives the following proportions for 1910:

Women teachers.....	78.9%
Men teachers.....	21.1%

The statistician of the United States Bureau of Education (World's Almanac, 1917) gives for 1914:

Women teachers.....	80.2%
Men teachers.....	19.8%

or an increase of 1.3% female teachers in 4 years.⁴

Let us take the statistics last mentioned as a basis for comparison with our own results:

	Women teachers	Men teachers
U. S. Bur. of Ed. statistics, 1914.....	80.2%	19.8%
Distribution of the outstanding <i>good</i> teachers, designated by 370 20-year-old people in their recalling.	71.5%	29.0%

In spite of the fact then that the young people have met approximately 1 man teacher for every 4 women teachers, they have nevertheless found 9% more good men teachers, than we should have expected (if men and women teachers were of equal value in the school system).

	Women	Men
Out of 370 good teachers.	71.0%	29.0%
Out of 344 bad teachers.	74.1%	25.9%

We see the tendency: there are in proportion to the number of teachers of both sexes more bad women teachers than men and more good men teachers than women, which gives a due confirmation to our previous conclusion as to the need of more men.

⁴ This increase has also gained the attention of eugenicists as a problem of great significance for the future of the race. (Cf. 74, p. 259f.) Speaking of the American situation, the writer says: "Not less than half a million women, therefore, are potentially affected by the institution of pedagogical celibacy,—an institution which is to be compared with that of sacerdotal celibacy in the amount of permanent harm that it is capable of doing to the race." Certainly we are facing an exceedingly complex problem whose solution cannot be brought about by merely pedagogical investigations.

If we look upon the High School Period separately, we have:

	Women	Men
Out of 182 <i>good</i> teachers.....	65.4%	34.6%
Out of 168 <i>bad</i> teachers.....	67.3%	32.7%

Let us examine these results in the light of Thorndike's findings (67) that: "The central tendency (in high schools) is to have 3 out of 8 teachers *men*." "If the two sexes were of equal value then our sex proportions for teachers in high schools should have been:

Women	Men
5	3

whereas we get

For good teachers....	5.2	2.8
For bad teachers.....	5.4	2.6

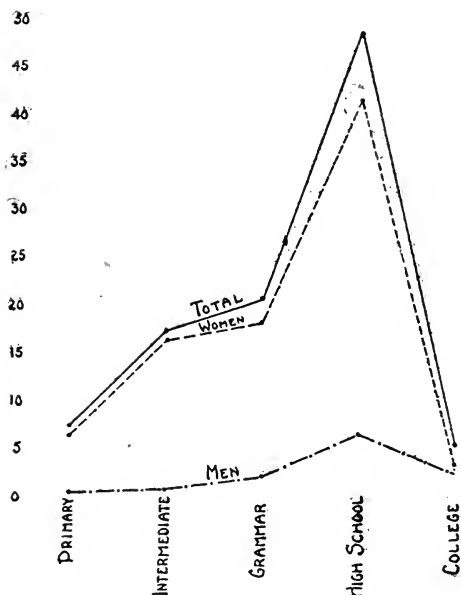
which result although corresponding pretty closely to that of Thorndike, shows in less marked degree the same tendency that we found for teachers within the whole school system. The question as to which sex of teachers suits the situation best at different stages⁵ in the school system for boys and girls will, it is to be hoped, be brought nearer a conclusive solution when we get the standardized estimation blanks mentioned before in cities and rural communities. However, from the point of view of the teacher's general influence upon the pupils, it will always be necessary to check the results from official estimation blanks by supplementary investigations like the different ones which will be suggested in the study here presented. These ought to be carried on as large a scale as possible in every large city, and brought into correlative comparison with the views of psycho-pedagogical experts.

The general influence of the teacher in its relation to the age of the pupil.—If we take the life period from which the pupils have their most vivid recollections of their best and their worst teacher as an indicator of children's general susceptibility for good and evil influence from *teachers*, the following diagram may give indications. All, both good and bad teachers, are taken into account.

We see, then, the general influence of the teacher constantly rising upward through the school system, reaching a quite remarkable climax for the *high school period*. From the point

⁵ A factor which may have some value for purposes of correlation here is seen in the fact that in one of my Norwegian studies (51) girls from 18-25 years of age had a man as their personal ideal in 56% of the cases, while only one man had chosen his ideal from the other sex.

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 THE INFLUENCE OF THE TEACHER THROUGHOUT
 THE SCHOOL SYSTEM. (TOTAL RETURNS 714)

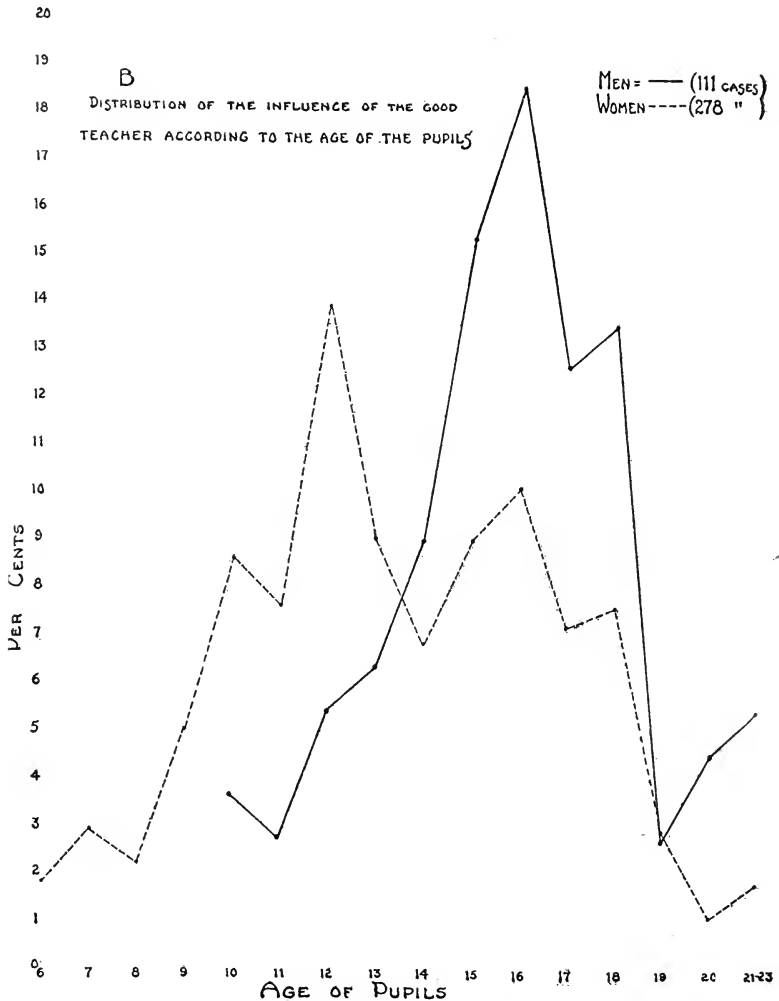


of view of general psychology one may make the objection here, that on the average the 20-year-old people, giving their returns, have a better memory for more recent events (the high school period) than for further removed ones (the grade school). However the vivid colors in which the good and the bad teachers in the grade schools are described in nearly all returns dealing with that period, seem to indicate that the factor mentioned has had very little significance. The few returns for the college age forbid any even suggestive results to be drawn for that period.

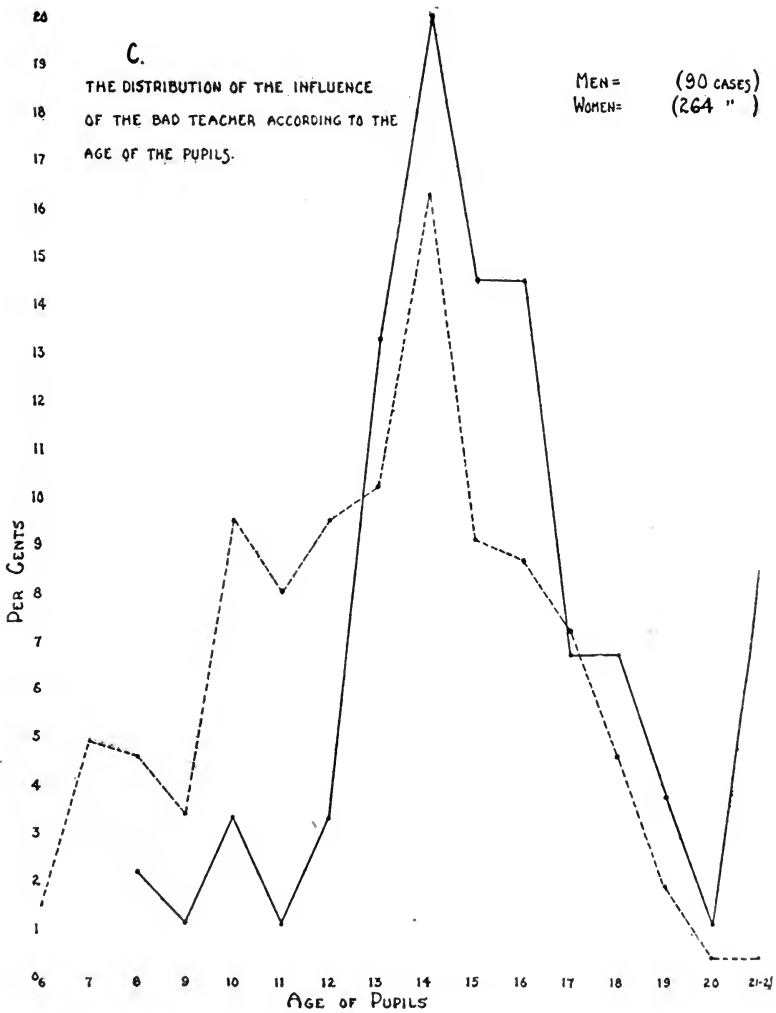
Let us now look in detail upon the relative influence of the *good* teacher according to the age of the pupil. The curves in Diagram B will give us some indications:

The first thing we notice is the considerable peak of the woman teacher curve at 12^o years of age of the pupil. This is in all probability due to the onset of puberty in girls, and

^o Sanford Bell has the greatest good influence coming in girls of the ages from 11-17, in boys from 12-19.



to their never forgetting having had a sympathetic woman teacher personality at that highly susceptible age. The considerable drop in the same curve at 14 years of age of the pupil may be ventured to a large degree to be explained in the *change of school*. This is generally the first year of high school. The pupil is met with almost entirely new methods of learning, new teachers, etc.; in short, it is a year of readjustment.



Looking at the man teacher curve, we see the remarkable influence of a good *man teacher* for the ages 15-18. From the girls' answers I have no doubt that the factor of the emotional elements following the sexual development of the girl, enters in here, as a very determining one. I take the explanation to be a confusion between the "father image" and the growing embryo of the forthcoming natural unconscious inclination towards the other sex; a period then when a

really trustworthy good man teacher for girls meets an unconscious but all important demand for their future development, better than any other teacher, and a period, when a tactless man teacher can do more harm than any other teacher. (Chart C.) The following diagram C seems closely to check up our suggestive results concerning the *good* teacher.

The curves have the same general shape, the climax of the influence of the bad teacher (man or woman), however, being shifted to 14 years of age of the pupil (from 16 for the *good*). Taking both chart B and C into consideration we reach this general conclusion for the 14th year of the pupils: they report *very few good teachers, and the greatest number of poor ones, both men and women*. What can be the explanation for this remarkable fact? On the one hand, the 14th year may be marked by special determining psychophysical traits. I have, however, not been able to find satisfactory evidence to this effect in the psychophysical investigations dealing with the ages around puberty. On the other hand, there seems to be an abundance of indications for our seeking the explanation *within the scope of the school system*. As we pointed out before, the 14th year generally means the first year of High School. Our result here then may be taken as one more proof that there seems to be something seriously wrong with this "transfer year," within the present school system, and that the Junior High School may here come in as a beneficial and highly necessary remedy. With regard to the preparation and selection of teachers for this new school, I should like to stress from the results obtained in this study, *that one can hardly be careful enough*. If the coming Junior High School is going to be a new school form simply, then it will mean very little or nothing. If, however, it is going to be built up on the broad background of all that we know about the psychic, physical, moral, development of the pupil, as pointed out in an excellent outlook over the whole situation by Douglass (18), and if the teachers for this new school be specially and broadly trained, then it may mean nothing less than a *real epoch* in the history of American pedagogy—furnishing thus also an ideal model for other countries.⁷

⁷ If the common complaint that boys in American schools are being feminized on account of too many woman teachers is true, the military training which the country is now planning might to a large degree compensate for this. The nation is in this matter facing a tremendous problem from an educational point of view. What shall be the fundamental principles for "this school in the army" for youth of different training and from different social milieu, and how are they to be worked out in practice? It might be of interest to see how an utterly

THE AGE OF THE TEACHER

While psychophysical measurements and mental tests are in progress in nearly all countries determining gradually the child's "physiological age" and "mental age" in their relation to chronological age, very little or nothing has been done in this respect with adult individuals.⁸ This is indeed a very serious lack from the point of view of the right selection and estimation of *teachers*.

With respect to the greatest benefit to the school child, as well as the social-economic aspect of the question, the teacher's age is of paramount importance. Here again future investigations based on a large number of standardized estimations of teachers, will be the only safe approach to our problem. With such comparative studies in all countries, we should before long have the necessary facts in hand. Until this can be done, the results from our material may serve as rough pioneer indications. Giving as they do the pupils' reaction to teachers of different ages (witnessed by their recall of it at a somewhat mature age), studies like ours here should also in the future be made along with those mentioned above.

The following table A shows the age of the teachers from which the greatest good influence came to the pupils. Each ordinate represents the percentage of all good teachers occurring at the ages indicated on the abscissa.

The general impression we get is that teachers (whether men or women) *below* 20 and *above* 40, are of less influence than teachers between these ages. *The most efficient man teacher* seems generally to be found from 25 to 35 years of age. The best woman teacher seems to have a wider range from 20 to 40 years; with the climax between 30 and 35.

It would be interesting here to compare, if possible, our results as to the age of the good teacher with the results in this respect from the studies of Ruediger and Strayer, for the grade school, and Boyce's for the high school, in which, as we have mentioned, the superintendents and principals

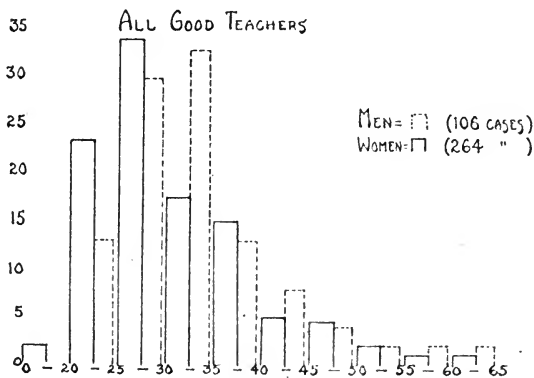
democratic country like Norway has tried to solve this question in practice in its own way, within its army made up by annual conscription of all men 21 years of age. I hope to give a little survey of the military educational arrangements of France, Germany, Switzerland, with special reference to Norway in this respect, in a separate article; meanwhile I may refer to my outline of the Norwegian system (pp. 651-655).

⁸The studies dealing with "old age" may be mentioned. An excellent outlook over the work done, as well as valuable original results, are given in Sanger, W. T. (56): *A study of senescence*. Unpub. Doctor's Thesis. 1915. Clark University Library.

judged and rated their teachers. Boyce (11) sums up the results from both studies as follows:

"In the matter of experience there are some differences, but the results tend to the same conclusion, that experience is an important factor in teaching ability."

A
AGE DISTRIBUTION OF TEACHERS:



The average experience of elementary teachers for the first and second classes was 13 years, for the corresponding groups in the high school, 11.8 years. If we set the age at which the coming teacher leaves Normal School or College arbitrarily at 22, then we get the best teacher age for the grade school around 35, for the high school around 34,—a result which, as will be seen from our material, corresponds, generally speaking, pretty closely to the outcome of this study, although the woman teacher seems to us to be very good already at 30, which, however, may be somewhat compensated for by the fact that she generally starts teaching about 2 years earlier than the man.

THE PERSONALITY AND THE METHODS OF THE TEACHER

Our question here had the following form: "Was it the personality or the methods (or both) employed by this teacher that caused you to like him or her?" As no noticeable differences between the grade school and the high school could be found from working up the material, the following table gives an orientating summary view of the answers, in percents:

Women's Returns			Men's Returns		
Good Teacher			Good Teacher		
Personality	Methods	Both	Personality	Methods	Both
19	3	78	22	12	67
Bad Teacher			Bad Teacher		
33.3	12	54.7	26	5	69

Let us try to examine the women's returns. The first we notice is that personality and methods in the good teacher seem to be intimately connected. The confusion of teacher with subject matter (and vice versa) which children and youth are very prone to, may here be an explanatory factor. On the other hand, this very factor points to the equal importance of both the teacher's personality and the methods employed,—from the point of view of evaluation and selection of teachers.

Educational quantitative psychology has touched this problem—as to learning—but very little light is yet shed upon it. From his gigantic statistical study of elementary mathematics Dr. Rice (66) draws the following conclusion: "The facts here presented in my opinion will allow of only one conclusion, viz., that the results are not determined by the methods employed, but by the ability of those who use them. In other words the first place must be given to the personal equation of the teacher."⁹ Thorndike says that Dr. Rice's material does not allow such a conclusion and points out other devices by which we may get at facts in this question. I have mentioned Rice's study because he is the first to try, by measuring of the school work, also to take the important question of the influence of the teacher into consideration. By more direct methods (as advocated by Thorndike) we may hope that educational quantitative psychology in the future also will try to study the teacher.

⁹ In his book of 1913 (52), Dr. Rice has abandoned the above view, and regards the personality of the Superintendents (as that of their staffs) as the chief controlling factor for spirit and results in the common schools.

Turning again to our table, the remarkable fact stands out that for one-third of all the poor teachers the disliked personality seems to have been the sole determining factor while the personality of the good teacher is stressed by only about one-fifth of all cases.

This proportion (3:5) gives food for thought. That the bad teacher is described as using poor methods for a time as often as the good one, is also significant in this connection. It should be mentioned here that "the personality of the teacher" is a tremendously broad term, and that in fact, in the popular sense in which it is used here, it embraces a person's whole "make up." In the myriads of elements which make a personality, the emotional factors may well be said to be of all importance, especially when we see a personality, as we do here, reflected in the minds of (or in the memory of) children and youth, who themselves have actually experienced the effect it may have. In many of Dr. Hall's studies, and those of his pupils, as also in several English and German ones, valuable light has been shed upon the emotions in children. A remarkable recent study by Watson and Morgan (69) based upon experimental data takes us still further, and is of special interest in our dealing with the teacher's personality. Leaving out the experimental background I quote the following:

"So convinced are we of the possibilities of getting higher incentives or drives from the use of these emotional factors, that we are sure our selection of teachers would be greatly influenced by our views. We think it would be a safe move now to provide in the early grades men teachers for girls and women teachers for boys, these teachers to be chosen for their pleasing personalities and for their abilities to attach the pupils to themselves in strong but wise friendships."

Further, he says that few of our present teachers "have the gift of controlling and using the pupil's emotional life." I have given so much attention to this study because it is my belief that through studies like that, as well as through Krasnogorski's (36) and Dr. Mateer's (41), a clear way, and perhaps the only one, is pointed out, for getting facts in the extremely complex, but also extremely important emotional relationship between child and grown-up, or, in our connection here between pupil and teacher. If the studies on the conditioned reflex can safely be brought over into the human field (as Dr. Mateer's results especially seem to indicate), then we shall have numerous possibilities before us for work in the emotional field which has hitherto remained so obscure.

The ideal teacher personality has been portrayed over and over again in different phrases of nearly every *palladium*

within the history of pedagogy. (3) All of them gave it "ready made." The only trouble has been that their literary ideal teachers (Lassal's is an elaborate example) never have existed in reality, but have been and are a never-ending memory trouble to all students in education. Now should be the time when we, carefully and slowly through investigations, with the use of all available means and methods, should begin trying, on an empirical basis, to build up this ideal, not as a universal *unicum*, but on differential lines.

What sort of personality is most suitable as a teacher for girls of certain ages? What for boys at the different stages in their development? What sex of teacher for boys, for girls, of certain ages? What age correlation between teacher and pupils? etc.

These and many other highly important questions relating to the teacher, are now of great significance. Someone has said that the history of philosophy is "the history of human errors." The same may be true of the history of pedagogy, but we pedagogues are at least now in the fortunate circumstance of gradually getting means by which to correct the errors.

The main school subject (or subjects) through which the good and bad teacher's influence was particularly felt by the pupils. Two hundred and one pupils answered the above question for the good teacher, 120 for the bad teacher. The remaining part of the pupils say "all" subjects, which statement, indefinite as it is, well goes to show that strong personal attachment to a good teacher gives an interest on the part of the pupil, so to speak, in whatever subject she or he teaches. Still more markedly (according to our figures) is the reverse true in the case of the disliked teacher. The personal dislike there seems to be for a great many pupils a determining factor in diminishing their interest in whatever subject he or she presents to them. The following typical examples may be cited:

"She made me tremendously interested in History—a subject which always had been a bore to me. Through her winning ways and personal talks I got so fond of her, that I began to look forward with joy to her lessons. Before I got her, I used to dread every hour in History." (College girl in recalling a high school teacher.)

"His personality and ways were such that you could not avoid listening with interest to whatever he taught." (College boy recalling a high school English teacher.)

"I think we all felt so repulsive against her, on account of her general manners and all, that we paid very little attention to all that she said." (Bad high school teacher.)

In the now so numerous and elaborate mathematically

worked out international studies of children's interests in the different school subjects, the important teacher-factor here brought to light has hitherto been totally left out of question. This is indeed a very grave objection against them. Such studies in the future may possibly be made in this general way: Expert evaluation based on long and thorough observation of the different teacher personalities in the particular school, then the results of this, brought into correlation, with the children's returns. I have no doubt that we in this way would find a high correlation coefficient. The emotional life of the child and youth (we may take it out of almost every chapter in Dr. Hall's "Adolescence") is the very basis of their mental "make-up." Pure logical or intellectual judgments are indeed very rare. Hence then we have the confusion of teacher with subject matter, and vice-versa, not only generally speaking, but also in cases, for instance, where the pupil has outspoken personal ability or inability in a certain subject, or subjects. In reading, for instance, a statement like this (there are many like it):

"I simply could not stand her (her shrieky voice still rings in my ears!) and I firmly believe that was the main reason why I lost all my interest in mathematics for about two years." (College girl on Freshman teacher in high school.)

we get a clear impression of the all-importance of our beginning to realize the significance of the dynamic-emotional abilities in the teacher's personality, and especially "the sympathetic touch," without which many a child may be given a transferring help even in a purely intellectual school subject, like mathematics. Some people are children their whole lives, in this respect, as bibliographies, especially of artists, furnish abundant proofs. Sympathy and consideration, however, are not the only emotional reactions towards which the teacher should strive. We would also emphasize the importance of righteous anger and indignation, within normal limits to be sure, through which the pupil may learn how to meet these emotions in others, and to transfer them into valuable incentives for personal effort.

Here, it seems to the writer, we are up against a great problem in modern pedagogy. The Herbartian doctrine of interest is often misunderstood. "Froebelianism," and "Montessorianism," "Lighthardianism," and all other valuable points of view, especially for primary education, are taking too great a place in secondary education. Life is not play; it is very rarely that life means an opportunity for the individual to follow his interests, etc.

Turning again to our material, the following distribution table of the main subjects through which the pupils have met their best teachers gives us some interesting indications.

	<i>Inter.</i>	<i>Gram</i>	<i>High S.</i>	<i>College</i>	CHART FOR HIGH SCHOOL
English %	3.5	7.0	28.0	2.5	
Science	2.5	3.5	19.5	1.0	
History	1.5	4.5	9.0	1.5	
For. Language	—	2.5	13.5	—	
Med. Age	10.6	13.0	16.4	20.5	

The striking fact in regard to science was that it over-balanced English throughout the school system, especially so in the grade school, and a little less markedly in the high school—as to number of disliked teachers. From the returns the following reasons may be given as typical:

1. "He knew his subject very well (physics) but he did not seem to understand that he talked over our heads the whole year. Some told him so, but he went on as before." (High school.)
2. "She seemed to think that there was nothing else in the world than mathematics. If you were not very clever in that, she would not have anything to do with you."
3. "She taught Home Economics out of a book"¹⁰

An overwhelming majority of bad science teachers are characterized as specialists, lacking a broader outlook, using bad methods, taking interest only in the clever pupils, not interested in the subject, etc. The English teacher comes in second as to number of bad teachers. With a summary view over both our tables we may stress this:

The English teacher (as also English as a subject) has the greatest good influence and may have a considerable bad one, especially in high schools.

The science teacher (and the sciences as subjects) may have a relatively great influence; in this study, however, the

¹⁰ We may quote here an amusing and instructive experience of Dr. Seashore (58, pp. 79): "As a child I had the advantage of learning arithmetic under a teacher who did not know the subject. She had difficulty with fractions, but had the good grace to leave us to our own devices. We discovered that after reading the introductory statement for each new section and performing the required operations with confidence in our efforts, we had but little need of the teacher The impetus thus gained was a permanent asset. Although I later had good teachers, I proceeded by the same method with algebra, geometry, trigonometry, and conic sections" Although this observation contains valuable suggestions, it would be rash to generalize on it!

bad influence from them seems almost twice as great as the good.

Foreign language has the smallest number of bad teachers, and on the positive side seems to rank high in the high school.

The final suggestive results may be that they all deserve special attention—as to fundamental training, as well as through practical supervisory measures in schools. As it is at the present time, a large number of high school teachers seem to be getting their material and indirectly their methods from the colleges, a state of affairs anything but sympathetic toward the high school mind. On the other hand a majority of the teachers from the normal schools may have a large amount of the theory of teaching, with little subject matter. Taking all different factors from the entire study here presented into consideration, the general impression remains that some fundamental changes in the high school teachers' preparations seem to be an urgent need of the time. The problem is at present under discussion and consideration also in most of the European countries.¹¹ As to the rôle of Educational Psychology in this matter, it is high time to turn more to a differential psychology of the adolescent years on the one hand, and try all possible means of getting at the influence of the teacher for these plastic years, on the other. The day must come when no teacher is allowed to enter into teaching in a secondary school without having had a thorough course in Educational Psychology—arranged with special reference to the subjects he is going to teach (35), as well as the sex and age of his coming pupils. By international comparative studies and views we may hope for a reformation of the present situation in the near future.

THE PHYSICAL APPEARANCE OF THE TEACHER

According to common opinion among school authorities, the physical appearance of the teacher, and his personal "magnetism," are very great factors in the teacher's personality, and have great effects upon the children. We have up to the present time very few objective data upon this question. What our returns may show on this subject may serve to point out the necessity of investigations here, and give some indicative results. It may be that the coming standardized teachers estimation blanks will give material enough for correlations

¹¹ In Germany: "Bund für Schulreform." (Berlin, Founded 1911.)

In England: "The civic and moral education league." London.

In France: "La league d'éducation morale." Paris.

All three have publications.

on a large scale. However, it will always be a problem besides to get the children's reactions, and this we think can no better be done, than (as in our study here), by obtaining returns from somewhat mature people, who are (as is the case here) not too far removed from the experience in time, and who on the other hand are able, on account of their training, to look calmly back over former vivid experiences in this matter.

Let us first see what our returns say about:

THE GENERAL APPEARANCE OF THE TEACHER

	Good		Bad	
	Men	Women	Men	Women
Good looking.....	60%	74%	..	12%
Attractive.....	25	17	14%	21
Not good looking.....	15	9	50	51
Ugly.....	..	..	36	16

It should be taken into consideration here that by far the greatest number of the returns are from young women. What we get then, is that 85% of all good men teachers and 91% good women teachers are designated as good looking or at least as having had a pleasing appearance (attractive); while the bad man teacher was not good looking or ugly in 86% of the cases, the bad women teachers in 67%. Even if we take these numbers on their face value, our result seems to indicate clearly that there is a high correlation between personal pulchritude and a good teacher, in the common schools—a fact which naturally does not exclude the good exceptions, as we for instance have them in our study here. The 36% bad men teachers designated as ugly corresponds largely with the ages in the recalling young women of 14-15-16. Their appearances are pictured in such minute details as to back up fully what we have mentioned before as to the high degree of sensitivity for outer personal attributes of a man teacher for those girls' ages. We are told here of the color of his hair, the way he wore it, the color of his eyes, the nature of his looks, his features, the way he used to smile or grin, his complexion, whether he shaved often enough or not, to what extent he manicured, to what degree his shoes were polished, etc.! Here are some terms used in regard to the bad teacher: "Sour looking," "stern looking," "awkward looking," "large

bulging eyes," "effeminate face," "stiff face," "shiny face," "sharp features," "hard face," "hair down in his eyes," "dried up face," "stubby hair, and long moustaches, always wet," "black nails," "awful smelling breath," "never smiling face," "ever smiling face," etc. One young girl tells a whole story about her former teacher in the following words: "He looked like 'Ichabod Crane.'"

Some general outstanding characteristics of the good woman teacher may be noted: "Motherly looking," "sweet face," "cheerful face," "rosy face," "intelligent looking," "delicate skin," "striking carriage," "stately," "quick in movements," "graceful walk," "old type of beauty," "she was one at whom you would like to look a second time," "she appeared like a queen, yet was not lofty," etc.

The following table gives us some indications as to some physical attributes of the teacher:

	Good		Bad	
	Men	Women	Men	Women
Figure:				
Stout.....	7%	18%	25%	33%
Medium.....	32	48	17	14
Slender (slim)	61	34	58	53
Height:				
Tall.....	55	86	61	46
Medium.....	13	..	9	26
Short.....	32	14	30	28
Complexion:				
Light.....	6	43	..	28
Dark (including brown hair)....	94	57	..	42
Health:				
Poor (nervousness).....	11	16	7	25
Good.....	89	68	93	75

Leaving these numbers for the present we will first stress the apparent difference in health between male and female teachers. The percentages, 11% of male and 16% of female teachers, characterized as not healthy, have been compiled by carefully going over the returns and marking the bad teachers and those good teachers who clearly are designated as having been nervous, so that the pupils in their recalling remember that they actually suffered, although they in the eyes of the pupil seemed generally to control it wonderfully. The greatest part of all nervous teachers (78% of them) are more than 35

years of age. We can of course place very little significance upon so little material as we have here; it is an interesting fact, however, that this last finding seems to correspond pretty closely with the results of the latest German study. (53) Ninety-five teachers under treatment for nervous diseases in the psychiatric clinic in Jena had entered in the following years of their age:

From 20 to 25 years old.....	7.4%
From 25 to 35 years old.....	20.0%
From 35 to 45 years old.....	44.2%
After 45 years old.....	28.4%

As we see, most of the patients had broken down between 35 and 45 years of age, and Rohde finds that the nervousness is of different sort before and after the 35th year of the teacher. Before, it has very little to do with the vocation, is not "Berufsnervosität;" after the 35th year, it is decidedly so. This result seems in direct opposition to earlier investigations, for instance, Wichmann's; and the conclusion Terman draws from studies up to 1912, in his excellent book. (65)¹² "The investigations prove that it is the beginning teacher who runs the greatest risk of pathological nervous exhaustion," may not be finally established. Dr. Rohde's table is of interest also in connection with the good teacher's age, as we have brought out in this study, the middle age of them all not exceeding 35 years.

As to the influence of the teacher's health upon the pupils Dr. Burnham says (13): "With the emphasis now placed upon school hygiene teachers suffering from tuberculosis, nervous disorders, and the like, will not long be permitted in the schoolroom." "Teachers who can set an example of healthful living and normal mental activity will more and more be demanded for the public schools." It seems from this study that there is a definite positive correlation between excellence of the teacher in the common school and his or her health. "She was so nervous, that she could shriek over the smallest thing now and then, and frighten us almost to death," writes, for instance, a college girl in recalling her 8th grade teacher (aged 41-2).

Turning now to the dress of the teacher, we may first note that all good teachers are recalled as having been "very neat" or "neat" in dress. In my Norwegian study (50) I was able to draw the conclusion that children between 7 and 11

¹² An excellent little monograph, which should be in every teacher's library, not in the ordinary sense of that term, but it should be looked over frequently as a memorandum for the teacher on how daily to invest his best capital—the physical and mental health.

years especially lay great stress upon the appearance of their acquaintances. From this study it turns out that a similar conclusion seems to hold still more true for the ages of 12 and 18 in girls, and that dress generally speaking plays a great rôle in children's estimation of their teachers.

The teacher's general manners seem also to be an important point in the make-up of his personality:

"For example he would slouch way down in his chair and practically sit on the back of his neck. The following is horrible to tell, but it illustrates clearly what I mean. He used to clear his nose in his throat and then use the open window in place of a handkerchief or spittoon. We were usually working at the board during these occurrences and he probably thought we didn't notice him, but I believe that some few always knew, and the rest soon heard about it." (College girl in recalling a high school teacher.)

Similar statements are not rare. To sum up the indicative results as to the good teacher's general physical appearance it appears from this study that the ideal American woman teacher should be: Good looking (or at least attractive) with a general cheerful expression, dark or light complexioned, rather tall, blue or brown eyed, of a median figure, healthy, neat, well dressed, stylishly or in subdued colors, have refined manners, a good carriage, be "quick in movements," have "a graceful walk," etc.

The ideal American man teacher is indicated as: Dark complexioned, tall, slender, physically strong, healthy, well dressed and with good manners.

The bad woman teacher is recalled as follows: In 86% of all cases not good looking (or ugly), slender, tall; in one-sixth of all cases, in bad health (nervous), in one-fifth of all cases designated as untidy in dress and person and very often with careless manners.

The bad man teacher: Slender, of medium height, dark complexioned (94%), in 7 out of 8 cases unattractive or actually ugly, while every other one of them are designated as untidy in dress, and many noted for bad manners.

It should be noted that these traits mentioned (on account of the fact that most of our returns represent the recollection of young women), should belong especially to the ideal American teacher of girls. Future investigations ought to bring out the physical ideal teacher for boys, of different ages, and also try to designate whether there are outstanding differences in preferences at different stages of age, within the school system, for boys and girls.

What seems, generally speaking, to have been brought to light in this study is that physical appearance, dress, manners,

etc., are essential factors in the teacher's personality, which on account of the great suggestibility and the lack of broader judgments in children, may, at least temporarily, increase or decrease the influence of the teacher.

THE TEACHER AND DISCIPLINE

There is no noticeable difference between the grades and the high school here. The answers allowed the three definite groups—strict, moderate, lenient. The following table gives opportunity for numerous comparisons, not only for the differences between the sexes, but also for those within them. To see whether the specially young teachers would show any definite difference from the older, they are divided in the table into two groups. "Young" means below 30 (or 30) years of age; "Old," over 30.

NATURE OF DISCIPLINE—DEGREE OF STRICTNESS

	Good Teacher				Bad Teacher			
	Men		Women		Men		Women	
	Below 30	Over 30	Below 30	Over 30	Below 30	Over 30	Below 30	Over 30
Strict.....	47.8	52.2	61.7	49.88	18.9	36.8	51.0	71.2
Moderate....	52.2	43.4	21.4	36.25	....	5.3	3.4	3.4
Lenient.....	....	4.4	16.6	13.06	81.1	57.9	45.6	25.4

We shall point out a few of the facts and leave the rest for the reader's consideration.

The good teacher. In the larger percent of cases the "old" man, according to our results, is stricter than the young, while the "young" good woman teacher is much stricter than the old.

Explanatory factors here may be that the good old man teacher relies upon his experience, knowing where the boundary limits of his discipline are, while the good young man is not settled as to the nature of his discipline, and is also possibly unconsciously relying upon his physical and mental vivacity. He may also purposely have adopted the more modern ideal of discipline, and have had the personality to handle it. The good young woman teacher, perhaps determined by her sex, may feel that she must assert herself and hold the upper hand of the situation.

The bad teacher. Neither the young man and old bad man teacher appears to be very strict, especially is this true of the young bad man, who is exceedingly lenient. Typical answer: (young man). "No, he was not at all strict, most of the time he simply did not care."¹³

Both the young and the old woman teacher are strict, with the old woman much more strict than the young, and *stricter than any other group!* A number of sex and age factors probably enter in here.

General results are that all good teachers are "strict in discipline to a certain degree"—which from the returns appears to be apparent to the pupils, from their ruling the class, through their personalities and from a certain few fixed principles, which the children often seem to have generally "felt" more than they have been actually conscious of them, and which have been silently accepted by them as natural. "I would say she was strict in discipline. She never said much about attention, however. Her manner simply commanded respect, and so she obtained involuntary attention" (high school).

We may give the following general results: It is the bad teacher who resorts to the largest degree of physical punishments, and the old bad woman teacher uses it more than any other group, while the old man leads in "ordinary corporal punishment."

All good teachers, here recalled, used corporal punishment in rare cases—which fact seems to be in agreement with Dr. Hall's statement that "there are certain child natures, for which physical punishments cannot be entirely dropped."¹⁴

¹³One fact seems to stand out throughout this study, namely that there is a type of bad young men teachers within the school system of the United States, who seem to use the teaching profession as "a stepping stone," and whose influence upon their pupils, we may learn from our material, has been anything but beneficial. One may offer the suggestion that it be made obligatory for him to stay a certain number of years, as a secondary solution, until the wages are raised so that a teacher will find himself satisfied wherever he is placed in the system.

¹⁴It may be interesting in this connection to relate Dr. Hall's first "disciplinary case," which occurred when he, 17 years old, started teaching in a country school in Massachusetts. Some of his pupils were much larger than himself, and especially two of them had all the time before been used to being "their own masters." The first day Dr. Hall had the class, these two fellows were chewing tobacco in the schoolroom. He spoke to them about it, but they did not care. Before he left school that day, he hid a strong rod among the wood at the fireplace. The next morning, when the boys behaved as usual, he asked them to stop the chewing. They gave some obstinate remarks. A regular fight followed. Thanks to the rod Dr. Hall got the

As to general disciplinary measures used, the good teachers seem to resort to self government and the honor system, friendly private talks;¹⁵ in these ways relying upon the pupils' personalities and his own, while after school sessions, seem to mark their principal form of punishment. No good teacher sent a pupil to the office.

The bad teacher seemed to use after school sessions, sending the pupil very frequently out of the room or to the office, expulsion, punishing by grading, and to be very prone to sarcasm, scolding and threats.

To all that we hitherto have learned about the bad old woman teacher, it may be interesting to add here, that she is quite alone in regard to such disciplinary measures as: Putting the child in the closet, tying it to the chair, depriving it of personal adornments, etc.

That the kind of punishments used seems (from this study) to be a good indicator, may be of interest to supervisors and to those scientists who are trying to build up standardized estimation blanks for teachers.

THE TEACHER'S SENSE OF JUSTICE

Were the children specially favored or specially misused?

The good woman teacher seems, from the returns, to have taken a personal interest in *all* the pupils and to have treated everybody on equal terms in 75% of all cases. A typical answer follows: "She took equal interest in the dullard and the dux."

In 25% of the cases the pupil had, to a more or less degree, the feeling of being specially favored. In by far the most cases, however, this was not accompanied by any discredit

upper hand, and succeeded in getting both out, shut the door and continued the lesson. The next morning they were not let in. Finally after some days they were let in on promising to behave. In short, there was discipline in that room thereafter, and the significant thing about it all is that whenever he in later life met these two men, who are now old people, they always reminded him of the event, and never failed to thank him heartily, for the beating they had gotten at the right time in their "*Schlünger-periode*." (Kindly related to the writer by Dr. Hall.)

¹⁵ Sarcasm is a trait, developing very late. For young children it ought thus to be totally banished. For the upper grade of high school it might well be rarely used, as an *art*, by a broad teacher personality and may thus be made a stimulus and an incentive for the pupil.

We think Dr. G. H. Palmer, (47) clearly has shown the *dangers* which may be implied in these measures, viz., that the teacher in executing it must not cheapen himself through "a slap on the back acquaintance."

given to the rest of the class, and was explained in terms like these:

"I was specially favored with her companionship outside of school hours."

"I felt that she thought I was her special charge (and a most troublesome one)."

"She complimented my work especially."

"I had the feeling of being given special help."

"She let me ring the bell and do other small duties."

One can take from the returns here, that the good woman teacher seems to have some peculiar womanly way of communicating her special satisfaction in, and her good-will toward, the most worthy pupils, so that it reaches its proper destination without giving it undue publicity to the class in general. This special gift, which may have its basis in the woman-nature, seems to be a most beneficial one as a real but perhaps half-unconscious stimulus to the best work of the individual of the class. The probability of this statement is shown in replies like the following:

"Sometimes I thought I was favored, but it may be because we understood each other, and I tried my very best to please her." (High school.)

The good man teacher seems to lack this peculiar subtle means of "wireless" communication, as only 15% of the pupils here report having been conscious of special favoritism. His manner of showing favoritism publishes his intentions broadcast to the world. This is evident from about all the returns which claim special favoritism on the part of the instructor. The following examples may be given:

"He would go hunting with some of the boys but never with others." (High school.)

"He always put me up as an example to the others." (High school.)

"He favored me by giving me too high marks."

"He was a special friend to me as man to man." (College boy.)

In 85% (a little more than the good woman teacher) the good man teacher treated all alike—showing a fair personal interest in all.

"The blow was as likely to strike me as anybody."

"He favored only those who worked."

"He gave a square deal to everyone." Etc., etc., etc.

The bad woman teacher. Seventy per cent (70%) report that they were not especially misused or mistreated themselves, but more than 15% of these had special favorites. Some had such strong repugnance for the personality of the teacher or for the methods used that these factors overbalanced the fact that they were merely not misused. They say:

"She had strong likes and dislikes." (High school.)

"I was not misused, but I simply did not care for her." (High school.)

"She was rather good to me, in fact, but I think she was the most partial teacher I ever saw." (High school, reported in four cases.)

"Everybody was afraid of her, although not specially misused."

Thirty per cent (30%) however, were definitely misused:

"I was misused because she did not take care in discerning the real offender in any misconduct."

"She did not take into consideration that I was a lively and active child. She wanted the old-fashioned docile child, which I was not."

"I always felt a stranger to her." (High school.)

"She did not understand me." (High school boy.)

Leaving the number given to speak for themselves, I should like to stress my general impressions upon the reading of the returns: the lack of personal *rapproch* between teacher and pupil—the large factor of partiality—the lack of understanding of the child's character—and the overwhelming use of formal discipline.

The bad man teacher seems, from the returns, to differ in one special respect from the bad woman teacher. The latter seems at least by formal discipline, etc., to show some interest in the welfare of the pupils (although she very often fails in her intentions) but the bad man teacher seems to be almost apathetic even in this respect. Ninety per cent (90%) report that they were not misused (although one-fifth of these had special favorites) but they gave reasons as follows:

"He was too mentally lazy to misuse anyone."

"We couldn't find out his sense of justice because he was perfectly disinterested in anything but his salary."

The remaining minority of 10% tell of being misused in some special manner:

"He had his 'black sheep' when he was angry."

"At least he was not partial, for he misused us all."

"He took the most handy one to scold." (We probably have here the man who uses the teaching profession as a mere stepping stone.)

"I know that this teacher was disliked even more by other students than by me. I know of two concrete cases where a girl quit school, because of his crabbedness. One girl eloped with an aviator, and it came out in the papers that she had left school 'because a certain teacher made life miserable for her.' The other girl went to work as maid in a private family. She said that her work was hard, but her employer 'treated her' as if she were human, and did not 'continually nag' at her."

"This teacher was discharged from the school which I attended; at which the first incident occurred. He obtained a position in another school, at which the second incident occurred, about four years later. He was let out of the second school, but is, at the present time, teaching in another high school in the same city." (High school.)

Using a little psychoanalysis on the returns here, one practical fact stands out very clearly, that every mistreatment and misuse may be a great inhibitory factor in the general school life, and also in the after school life of the child. It may be that if we could trace this factor (and associated factors) we could illuminate in another light the statement of Dewey (17): "Hardly 1% of the entire school population even attain to what we call higher education; only 5% to the grade of our high school, while much more than half leave on or before the fifth year of the elementary grade."

Dewey maintains that this remarkable fact is due to the fact that the intellectual interest does not become dominant, but that the practical impulse or disposition is in the foreground. However, from our returns we should like to have an answer to the question: How many are driven from the school through the influence of the bad teacher?¹⁶

Similar studies were made of the returns from our questionnaire in regard to the teacher's voice, the characteristics of enthusiasm and optimism, the temperament of the teacher, the teacher in relation to literature and life, the teacher's social activities and the teacher's influence upon the pupil's later life. The most important results of these studies are presented briefly in the following summary of the outcome of the whole investigation.

SUMMARY—GENERAL CONCLUSIONS

1. A review of the present pedagogical situation of the *problem of the teacher* reveals: The study of the teacher has, with the exception of a very few experimental attacks, on the whole hitherto been neglected out of all proportion to its significance.

2. Our study here, confirming all earlier investigations in regard to suggestion and imitation in childhood, seems to prove beyond doubt that the "teacher factor" is of paramount importance,—in fact a *condition sine qua non*, for all studies dealing with the school child.

3. Thus all mass investigations, for instance, in regard to children's ideals, their interest in the different school subjects, measuring of the schoolwork, etc., will need to be checked

¹⁶Compare the study of Book (10); 97 pupils actually left high school for the main reason that they could not stand a certain teacher.

See also the studies of Stableton: "He thinks that the small percentage of male graduates from our high schools is due to 'the inability of the average grammar grade or high school teacher to deal rightly with boys in this critical period of their school life.'" Quoted from (27, Vol. 2, p. 285.)

up with special studies, bearing as directly as possible on this teacher factor. The whole field of child study in schools will need to be worked slowly and carefully over again, with this in view. Nothing less will give us reliable psycho-pedagogical data.

Our special results, which we present as in large part merely indicative are:

I. Judging from the relative percentages of the outstanding good and bad teachers whom the recalling students have met, and comparing these with the actual number of teachers of both sexes within the school system, our results seem to justify the general demand for more men teachers.

II. The general influence of the teacher is constantly rising upwards through the school system, reaching a quite remarkable climax for the high school period.

a. *The woman teacher's good influence* on girls is greatest at 12 years of age of the pupil; *the bad influence* from them reaches its climax at 14 years of age of the pupil.

b. The man teacher has the greatest good influence upon girls at the ages 15 to 18, his bad influence upon them is highest at 14 years of their age.

c. At 14 years of age of the pupil (freshman year in high school) we find: *Very few good teachers, and the very greatest number of bad both men and women teachers*, which result may point to the necessity of the Junior High School, with broadly and specially trained and well selected teachers.

III. a. The most efficient man teacher seems generally to be found from 25 to 35 years of age. For girls his median age is 35.

b. The best woman teacher seems to have a wider range, from 20-40. The relative discriminating point for good and bad woman teachers seems to be 30 years of age.

c. The good teacher is, throughout this study, generally relatively younger than the bad.

d. The age of the good teacher seems to vary very little with the rising age of the pupils up through the school system. (See tables.)

IV. We get a clear impression of the significance of the dynamic-emotional abilities in the teacher's personality. "The sympathetic touch" may give a transferring help even in a purely intellectual subject like mathematics.

a. *The English teacher* (as also English as subject) has the greatest good influence in mental character training, and may have a considerable bad influence (especially in high school).

b. The science teachers may have a relatively great good influence; in this study, however, the bad influence from them seems almost doubly as big as the good.

c. Foreign language teachers seem to rank high in the high school, while teachers of history, in this study (as in my Norwegian one), seem to have a low standard from the point of view of character building.

V. Personal pulchritude, neatness in dress and good manners are essential factors in the teacher's personality, and correlate very high with excellence of the teacher in the public schools.

VI. The good teacher's voice is given as: Medium in pitch, smooth in quality, and moderate in volume.

The bad female voice is designated above all as nervous, the *bad male* voice as feminine. The teacher's voice has been a *very essential factor to all recalling students*.

VII. Enthusiasm and optimism (as we have defined these traits, seem to be absolute attributes of a good teacher, being present to a more or less degree in all recalled good teachers.

VIII. In all cases covered by our data the good teacher seems to be of flexible nature, able to suit different situations, however, with a predominance of joviality, and sense of humor, as a general background. The good grade teacher must possess the ability "to let himself go" occasionally in-unrestrained "fun" with the children.

IX. All good teachers recalled are designated as self-controlled, a trait apparent to the pupils in various ways.

X. Eighty-nine per cent of all recalled good teachers were listed as bringing the pupils in touch with actual life in various ways. Formal teaching, and little or no attempt at education, characterizes the bad teacher.

XI. The good man teacher over 30 years of age seems to be more strict in discipline than the young; while the good young woman teacher is much more strict than the old. The old bad woman teacher is more strict than any other group, and uses *physical punishment* in 3 cases out of 8. All good teachers here recalled used corporal punishments in rare cases. The art of punishment used by the teacher is a good indicator for judging thus the general good and bad influence from him.

XII. The teacher's *sense of justice* is a trait apparent to the pupils in various ways. Mistreatment and misuse from the side of the teacher may be of *determining* influence not only on the child's school life, but also on its whole future.

XIII. Approximately every second good teacher visits the home of the pupils.

XIV. There seems to be a high correlation between all good teachers and their social activities with the pupils. Men seem to be more active than women, in this respect.

a. Athletics and sport ranks highest.

b. High school woman teachers' informal walks (whenever the pupils were allowed "free talk") are stressed as having been of very great value to girls of 14 to 18.

XV. Every good teacher has been associated more or less clearly with a life ideal, which stands out for the recalling students, as one intimately incorporated in the teacher's personality. In 40% of all cases also orally stressed "maxims" had been taken to heart by the pupils and had been guiding principles at work for from 1-12 years! This fact supports the plea for systematic "moral training" like the French (combined with the right teacher personality) for the grade and high school.

XVI. As to the lasting effect from good and bad teachers on the pupil's later life, this seems to be of vital importance in to the pupil's choice of vocation in leading their interest in a certain good direction, in helping them to overcome innate character difficulties, etc., etc.

XVII. The influence from good and bad teachers reaches far beyond their own activities—in the positive and negative effect they may have on the *coming generation of teachers*. This points to the necessity of good teachers in Normal Schools and in all other training schools for teachers.

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THE TEACHER AND HIS IDEALS

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It is an oft-quoted saying of Bernard Shaw that 'those who can *do*, and those who can't *teach*.' It is a characteristically Shavian and somewhat brutal epigram, but it bears witness to the disconcerting fact that the teacher is not yet appraised by society at his full value.

History has done surprisingly little to spread the fame of great teachers. Even Aristotle, famous as philosopher, was, as teacher, less famous than his royal pupil, Alexander. Dante has indeed shed some reflected light upon his schoolmaster, Brunetto Latini, but it is lustre of a rather lurid kind. We see him in Hell, smirched with fire and appealing to his pupil to preserve the memory of '*Il Tesoro*'. Shakespere has done no more for his Stratford pedagogues than to give us the picture of Sir Hugh Evans in the '*Merry Wives*'. And, if others have refrained from consigning their instructors to an Inferno of one kind or another, they have not, on the other hand, provided large space for them in any Campo Santo or Westminster Abbey.

This scant appreciation shown by the historians is justified materially by the slender pecuniary reward which awaits even the highly successful teacher. Civilization, which so lavishly remunerates the impressario of human follies and frivolities, and pours out gold like water at the shambling feet of a 'Movie' favorite, has seen to it that its sympathy with the teacher takes a less substantial expression than the financial. This is, of course, nothing new. Four centuries ago, in 1515 (to be precise), there was born one of the most illustrious teachers, Roger Ascham, author of '*The Scholemaster*.' You will recall the story of the interview, towards the close of his life, with Queen Elizabeth. Ascham had gone to apply for a pension and in his petition he left a good space for the figure which Her Royal Grace, he hoped, would insert. The space, he remarked humorously, was much too large for a *decemlit* (in pounds), or even a *viginti*. He was hopeful for a *quadraginta*, or an *octaginta*, which would have fitted well. Alas, the Queen contented herself with a beggarly *viginti*. Yet, when the old man died, Her Majesty declared that she would rather have cast ten thousand pounds into the sea than have lost her

Ascham. This goes to show that the market value of teachers, which descends with age, rises considerably with death. Many of us, no doubt, would gladly be paid to-day on the evaluation made one day after death.

Now perhaps the most unfortunate result of this comparative lack of present appreciation is that it frequently begets self-depreciation and even a kind of self-contempt in the teacher himself. It is no rare thing, I fear, to find a certain apologetic attitude on the part of those who are serving the state by teaching the young. Instead of magnifying their function we find a disposition in many, on some slight provocation, to renounce their vocation and pass out of the ranks of the profession. In the case of that large number of teachers who belong to the fair sex, there is an uncomfortable suspicion that Mr. Gayley's description of 'a mob of mobile maidens meditating matrimony' is not far from the truth. In the case of the lamentably small number of men attracted to the teaching profession we find not a few escaping at the first opportunity into official and administrative work. It is always a sad thing when a man loses the sense of vocation, when the ideals which once awakened enthusiasm and braced men to endure hardness turn to Dead Sea fruit and beget despair and disillusion. And nowhere is this loss of vocation more tragic than with those who, after having aspired to mould into fair forms the plastic mind of youth, have come to see in their work only an ill-requited drudgery.

In pleading for a higher courage and a nobler vision than are sometimes suggested by experience, let me ask your recognition from the outset of the fact that the teacher must always be prepared to find his wage less than his worth, and even contemplate as inevitable a certain self-sacrifice which more material callings need not demand. You make boxes at a factory and it is easy to determine their exact value and make the wage accordingly; you teach, and the results must be judged not in time but in eternity. Who can prescribe an adequate wage for work which is so largely secret and beyond the judgment of men? Who can estimate aright results which are so frequently posthumous and remote? Justly did Browning select the Grammarians as his illustration of the 'high man,' contrasting with the 'low man' who succeeds so definitely in the material thing he has set himself to achieve. Therefore, who so fittingly as the teacher deserves the lines:

'Lofty designs must close in like effects:

Loftily lying,
Leave him still loftier than the world suspects,
Living and dying.'

No teacher who is worth his salt but will envisage this fact from the beginning and so avoid making his circle premature or entering port too soon.

Out of the spurning of low ideals, because of the knowledge that nothing so soon disgusts as the things which are easily realized, will grow the courage which will never flag in the presence of the challenging heights. The conception of a profession as a newspaper puff or as a meal-ticket will soon cease to attract. *'Inspexit et despexit,'* is the description of S. Bernard's victory over a certain temptation. But it is necessary to go on to something more positive.

To begin with, courage will rise as the teacher comes to understand that the work of a teacher, ill-requited as it may be, is one of commanding influence within the community. It may seem paradoxical, but it is true to say that the smaller the community the greater the influence. Take, for example, the work of one teaching in small rural towns and villages. In the middle of the 18th Century Shenstone wrote *'The Schoolmistress'* in which he described the old dame 'in lowly shed and mean attire,' before whose thatched cottage grew conveniently 'a birchen tree,' and who ruled her little world like a queen. Closer home, we have the immortal picture of the school-mistress in the *'Autocrat,'* whose fortunes we follow from the time when she comes down with a rose in her hair and one in each cheek to the time when she consents to take the long walk with her lover and receives from Benjamin Franklin the wedding present of a Cupid caught in a mouse-trap. And what wealth of material for literature there is to-day in the story of the young girls who go out from home and Normal school, trembling with the sense of strange responsibility, yet bringing into the environment, unfamiliar and even rough and uncouth, the grace of a culture which is almost royal in its opportunities! There is something almost magical in the influence which transforms a young girl, in the course of a few weeks, into a power which is not only the standard of intellectual ambition but the arbiter of fashions and proprieties generally, despotic alike in dance and prayer-meeting, mighty to subjugate paganism (in the literal sense), and to twist school-directors to its will,—until the inevitable occurs and the little teacher goes as a bride to other service. I might take similarly other types and have no difficulty in showing that, outside as well as within the duties of the profession, the teacher is performing a service which leavens society through and through and entitles the most despondent of pedagogues to lift up his head and be of good courage.

I would, however, have the teacher go a little further than

in the regaining of courage. Courage is a great thing, even when it is stolid and passive. 'A noble aim faithfully kept' says Wordsworth, 'is as a noble deed.' Nevertheless, there are among the courageous too many of those whom Dante calls

'le gente dolorose
Ch'hanno perduto il ben' dell' intelletto.'

We need to stimulate to new endeavor that zest which can only come from joy in the sense of things worth doing and therefore done with pleasure. Do teachers always remember that the word '*school*' means '*leisure*'? Perhaps it is hard to believe this to be the fact. But it is true. The Greek word '*scholē*,' or '*leisure*,' was employed because the proper work of a school is to eliminate from life that drudgery (*kopos*) which is the feature of servile work. Intellectual work, if it is excellently done, must be done with a zest which makes it accomplished with ease. The worker must use his tools as the Chinese butcher used his knife. He knew (says the story) the joints so well that he cut up his carcasses year after year with a knife which never needed sharpening, because it never encountered unyielding tissue. Of course there must be work, but it should be work from which all the toil has been excluded by love, till every trace of work has been obliterated in the finished product.

Our schools generally afford wonderful testimony to the fact that, up to a certain point, our teachers have found pleasure in teaching. We see sometimes a fierce earnestness in the gaining of efficiency which is even a little pathetic. There is an ardent desire to make the work technically perfect and so to analyse the powers which make for success as to command success at will. That is good so far as it goes. It is good without qualification if the use of the faculties which are thus improved become in time natural and unconscious. But it is bad if all that is done is to turn the teacher into a useful machine, a kind of educational Ford, whose efficiency must be kept up by a little lubrication here or the tightening of a screw there. God help the teacher whose technique is always kept in full view of the public! He might as well be that old Chinese Emperor who had a glass front to his body so that he could always have an eye to the working of his digestive system. It is, of course, inevitable that much of a teacher's training should deal with technique, but I would press this opportunity to demand something more. This something is that which concerns the teacher directly as a *person*. I hold that the experimental method of advancing

education has justification only when it retains a personal conception of the teacher—and of the taught.

Teaching is, in the first place, not the parading of so much information before an assemblage of young people rendered potentially receptive by the possession of ears, eyes, and (alas) note-books. If this were so, a procession of sandwich-men with suitably inscribed boards might be as effective and more picturesque. Instruction by phonograph might even be cheaper and more consistently standardized.

Nor is teaching mere methodology. Education is not to be reduced to a card-catalogue or to a system of mnemonics. There is something pathetically futile about the teacher who has succeeded in making himself a mechanically perfect classroom accessory. The artificiality, the pose, the pretence, the veneer, which may pass the inspector and even perhaps win his encomiums, are all so easily detected by those most clear-sighted of individuals, the children. They penetrate easily the mask which is worn until it becomes all but the natural expression. The assumed moral indignation is so easily translated into a form of personal resentment. The cocksure assumption of infallibility, which must never acknowledge error, is so easily summed up as the worst form of ignorance. The following verse may be out of date in detail but it is true in substance:

“With emphasis a trifle strong
 I said it was completely wrong.
 Again he puts it. Then I storm
 And make him stand upon the form.
 Then he commits the self-same sin
 A third time, and I keep him in.
 To get it right he still declines,
 I give him several hundred lines.
 He makes the same mistake again;
 Then comes my last resource, the cane.
 I’ve look’d the matter up to-night,
 And find the little beast was right.”

If teaching, then, is neither the administration of information in duly regulated doses, nor the practice of an approved technical method, what is it? Sometimes it is convenient to get a little help from comparative philology.

The word *‘teach’* is to be traced back to a Sanscrit root, *‘diç,’* ‘to point out.’ The verb is the same as the Greek *‘deiknumi,’* and the noun *‘digit,’* or ‘finger,’ is one of the derivatives. Now ‘pointing out’ differs from mere telling in that it includes much else beside the creation of the channel through which information may enter the mind. There is

necessary the creation of the very organs by which observation is possible. There is, of course, in the first place, that training of the power of observation which we associate especially with the method of Agassiz. He would, we are told, put a fish into the student's hand and gradually draw forth from his pupil's observation every thing there was to learn. This principle of '*Venez voir*' is of sufficient importance in itself.

But the creation of the very power to observe goes much further. It gives extension to the limitations of the mind as a pair of spectacles will add to the range of impaired organs of vision. This is what in theology we call '*grace*,' and the good teacher must make his teachings, in a very real sense, 'a means of grace.' One of the greatest of ancient teachers was Alcuin, and some of you will recall a beautiful letter which he wrote to the Emperor Charlemagne in which he stated that, though his employments were in a humble sphere, they were neither ignoble nor useless, since he spent his time in teaching the noble youth around him and *inspiring them with a taste for learning*. This is what I mean by the imparting of grace. It is the supreme miracle which the teacher is empowered to work,—to open the blind eyes to the illimitable majesty and greatness of the universe. It is the supreme triumph of the teacher when he can take his place among those who are walking darkling amid solidest eternal things with the result that here and there a pupil cries out, like the man in the Gospel, 'One thing I know, that whereas I was blind, now I see.'*

* Rabindranath Tagore's experiment of an '*ashram*' at Bolpore is not translatable, probably, into the educational system of America, but there is suggestion as well as inspiration in his description of the all-too brief career of his assistant, Satish Chandra Roy:

"With him boys never felt that they were confined in the limit of a teaching class; they seemed to have their access to everywhere. They would go with him to the forest when in the spring the *sal* trees were in full blossom and he would recite to them his favorite poems, frenzied with excitement. He used to read to them Shakespere and even Browning,—for he was a great lover of Browning,—explaining to them in Bengali with his wonderful power of expression. He never had any feeling of distrust for boys' capacity of understanding; he would talk and read to them about whatever was the subject in which he himself was interested. He knew that it was not at all necessary for the boys to understand literally and accurately, but that their minds should be roused, and in this he was always successful. He was not like other teachers, a mere vehicle of text-books. He made his teaching personal, he himself was the source of it, and therefore it was made of life stuff, easily assimilable by the living human nature. The real reason of his success was his intense interest in life, in ideas, in everything around him, in the boys who came in contact with him. He had his inspiration not through the medium of books, but through the

Machiavelli used to say that brains were of three orders; one was that of those who could learn of themselves; a second of those who could learn through the instruction of others; and the third was of those who could learn neither of themselves nor through the teaching of others. The real teacher is he who succeeds with this apparently hopeless third class. The story is told of a tortoise, which someone had kept through the winter in a cellar, awaking from its hibernation one fine spring morning when the maid-servant went down for a bucket of coal. The girl came back shrieking, 'Oh, ma'am, the block I've been breaking coal on all winter has just come to life and is chasing me up the stairs.' Such miracles will occur in the school-room and the teacher must himself work the annual miracle of the spring by making those who have appeared to be but chopping-blocks awake to an active intellectual life. A more literary illustration will be found in Mr. Percy Mackaye's drama, '*The Scarecrow*,' where the poor thing of shreds and tatters comes at last, through the influence of love, to demand for himself a soul. In like manner, where the good teacher has intervened effectively, the veriest school-room Pumpkinhead may be awakened to outwit the devil.

If we can conceive of such miracles as within the reach of the teacher's art, we shall understand how much room there is for what we call, for want of a better name, *Suggestion*. What we call will-power is properly suggestion, the determined holding of an ideal before the mind of others till action follows. Environment itself is a form of suggestion exercised on the part of a whole community. The imparting of love is a form of suggestion, the most powerful that can operate in teaching. Shakespere, who is well-nigh infallible as psychologist, has shown us the very best kind of pupil in the lines:

"An unlesson'd girl, unschool'd, unpractis'd:
 Happy in this, she is not yet so old
 But she may learn; and happier than this,
 She is not bred so dull but she may learn;
 Happiest of all is that her gentle spirit
 Commits itself to yours to be directed,
 As from her lord, her governor, her king."

direct communication of his sensitive mind with the world. The seasons had upon him the same effect as they had upon the plants. He seemed to feel in his blood the unseen messages of nature that are always traveling through space, floating in the air, shimmering in the sky, tingling in the roots of the grass under the earth. The literature that he studied had not the least smell of the library about it. He had the power to see ideas before him, as he could see his friends, with all the distinctness of form and subtilty of life." ('*Personality*,' pp. 171-2.)

That might be embarrassing to the teacher if too literally true, but it is, nevertheless, a fact that the teacher must succeed in kindling some kind of corresponding emotion, or many channels of access to the mind of others will remain sealed.

It is evident from this that teaching involves the play of personality upon personality to an extent which we seldom realize. The best teacher must be he whose personality, natively strong, carefully trained, well-balanced, kindled and prophetic, plays upon the receptive and holds them as the Ancient Mariner held the Wedding Guest with his glittering eye until his tale is told.

This is a big task and, instead of depreciating the teacher's function, we may well say, 'Who is sufficient for these things?' We may not wholly succeed, but we must keep trying. I cannot forget what a Senior said to me a little time ago, 'Oh, if only our professors could make us feel in our freshman year what we get to feel for ourselves as Seniors.' Oh, if we could! You will recall that wonderful story of Daudet's in the '*Contes de Lundi*,' '*The last lesson*.' The tardy scholar drops into the Alsatian class-room at the hour when his old teacher is giving his last lesson in French. On the morrow the German is to take possession of the land; this is the last chance. How wonderful is the emotion, the attention, the strained silence! How much is learned as never before, ere the teacher, with tears streaming down his cheeks, writes upon the black-board, '*Vive la France!*', and surrenders his charge! It is reserved, as we think, for the rarest of circumstances to create such an atmosphere as this. But the spirit of the teacher ought to be able to create it day by day. When this is the case, his words become as oracles and everything is graven indelibly on the mind.

I repeat, this is a big task, a man's task,—one that demands the utmost freshness, strength, patience, enthusiasm and an unflinching faith. We may not always rise to it, but we must beware of the danger of falling below the level. A military officer has said that he always knew when he was in proper form, because otherwise he found his men drilling him when he was supposed to be drilling them. We too know as teachers when the initiative has passed out of our own hands through the failure to inspire. The transition from the one plane to the other is always tragic and often fatal.

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To what ends is all this toil of body and mind and personality?

1. *First*, as I have already said, it is to give vision. In

R. L. Stevenson's *'Will o' the Mill'* we have the story of the boy brought up in the narrow circle of the village, yet fired with the longing to cross beyond the rampart of hills which walled him in. Then we are told how there came one who made the outlook commonplace and crushed down the aspiration. So life flowed on, sordidly, till the great storm came and with the storm the hearse-like carriage, with Death as the driver, to deliver his soul from prison. The parable is a good one to remember. Death does indeed come at the last to restore us the vision we have lost. But life ought to keep the vision all along,—the sense of abounding freedom, range, possibility, enlarging faculty,—and the teacher must be ever bent on making the lives he influences fuller of content, delivered alike from the torpid existence of the materialist and from the feverish excitement of the voluptuary. Any study may be made the door of entrance into the Infinite, so that the pupil may learn, with Blake,

"To see a world in a grain of sand
And a heaven in a wild flower,
Hold infinity in the palm of your hand
And eternity in an hour."

2. *Secondly*, it is to inspire the work which shall transform vision into reality. Théophile Gautier tells us he knew only one line of Wordsworth, that which speaks of

"Spires that with silent finger point to heaven,"

but often as he sat, dull and depressed, and unable to work, he would find himself scribbling on the paper before him

"Group after group of heavenward-pointing spires."

So the Muse was propitiated and work was resumed.

So must the vision of the teacher produce work for himself and for the taught. Education, as someone has remarked, must never degenerate into a game of 'ring around the rosey.' The same power of personality which enables the student to behold the teacher's visions must enable him also to follow his leader in enduring hardness.

3. *Lastly*, it is to inspire to high human use of what is envisaged and translated into work. The final use may be beyond all power of observation. It will certainly transcend all that was in the text books, it will follow roads beyond even the teacher's ken; it may even completely supersede the instruction given at the start. But it will earn the right to find in the summing up all the value of the way. The prize will be in the process as well as in the goal. The justification for it

all will be found, not in the grading of jobs or in the estimation of increment of salary, but in the enriched tissue and the enhanced perdurability of life.

* * * * *

In the final result the teacher will have a very real share and will be permitted, *ex dono pupillarum*, to know his reward. There is in Holy Writ a promise, 'Thine eyes shall see thy teachers,' and I take it that this is a prophecy of that final fellowship which shall come at last in the full mutual recognition of the relation of the teacher and the taught. To some unworthy ones the prospect may be dreadful indeed, a veritable Day of Judgment, in which their work shall share the fate of the wood, hay, stubble and the waste things of the Universe. But to those who have maintained faith in their calling and have fought unflinchingly the good fight, there will be such joy and satisfaction as shall shed undying glow over the past and present and shall make the future glorious with hope.

INSTRUCTION IN MATHEMATICS FOR GIFTED PUPILS¹

ELIZABETH FRAYER BURNELL

Before outlining a course in mathematics for gifted pupils, an investigation was made of the provision of our public school system for students of unusual mental ability. A surprising dearth of literature on the subject was revealed. Periodical articles and Board of Education reports discussing this subject are so obscurely indexed as to be almost inaccessible. One of the most comprehensive discussions of the problem of the gifted child appears in a superintendent's report,⁽¹⁾ indexed as "Special classes for backward and feebleminded children." Detroit avoids the misinterpretation of the term "super-normal" and reports "special advanced classes." In the report of the McKinley Preparatory School, Lincoln, Nebraska, there is no obvious heading to indicate that it was organized for pupils of superior mental and physical qualifications. Superintendent Condon of Cincinnati has recently announced a "Special Academic Class" to be organized September, 1917, "for pupils of unusual mental ability and sound health." Even a superficial visit in the Detroit schools revealed classes organized for the acceleration of small groups of pupils in the elementary grades of which there was no report available in the superintendent's office. The following investigations indicate the development of this educational problem during the last six years.

1911. Provision for exceptional children in the Public Schools. (Van Sickle, Witmer and Ayres. U. S. Bureau of Education Bulletin No. 14.) Only five cities are reported as known to have classes for exceptionally gifted children: Baltimore, Indianapolis, Lincoln, Rochester and Worcester.

1912. School organization and the individual child. (W. H. Holmes.) An exposition of plans that have been evolved to adapt school organization to the needs of individual children, normal, super-normal, and sub-normal. "Promotion classes for gifted pupils," p. 138. Discussion of the acceleration of gifted pupils in Baltimore and a list of cities which made similar provision on the order of the "six-six" plan.

¹This investigation was carried out under the direction of Professor Charles Scott Berry, at the University of Michigan, in 1917.

1912. A year's work in a "superior" class. (Flora Unrich, *Psychological Clinic*, January.) Report of a class in the eleventh school district, Cincinnati, Ohio, consisting of thirty-two pupils of whom seventeen were prepared for the fifth grade, nine for the fourth grade, and the remaining six moved away or were returned to their respective rooms. There was a gain of one year for twenty-five pupils who did two year's work in one.

1912. Some studies on "abnormally intelligent" pupils. (Yasusaburo Sakaki. *Psychological Clinic*, March.) Report of the examination of all the children in the larger normal school at Fukawka in Japan which found 79 out of 332 to show advanced degree of intelligence. These children were classified according to definite types into seven groups and it was found "that only one class of abnormally intelligent children was perfectly free from any pathological taint and that these were the only children who possessed stability of nerve power and who exhibited a uniformly progressive mental and physical development . . . the others being children of the 'nervous type,' precocious children, children mentally advanced but deficient in physique, etc. . . . Our experiments and their results serve to convince us that there is urgent need for reform in the present system of class making."

1912. Seven years with unusually gifted pupils. (Frederick E. Downes, Harrisburg, Pa. *Psychological Clinic*, March.) Before revision of the course of study it was found possible for gifted pupils to complete the second and the sixth grades in less time; 350 skipped in one year. In 1910-11 two schools were established exclusively for bright children and in 1911-12 there were three such schools in which the children completed the eighth and ninth grades in one year.

1913. Special classes for bright children in an English elementary school. (I. Shaer. *Journal of Educational Psychology*, April.) A diagrammatic representation of various types of promotion is given.

1913. The physical status of the special class for bright children at the University of Pennsylvania Summer Session, 1912. (*Psychological Clinic*, March.) "The conclusions to be drawn from the experience of the summer school are that when due attention is given to such matters as diet, rest, exercise, home surroundings and physical conditions, the life of the school may foster physical improvement and well being as it has been made to serve the purpose of intellectual progress."

1914. A study of exceptional children in New Orleans. (*Psychological Clinic*, p. 232, Jan.). A preliminary census was organized in 1912 to determine where and how many children of five exceptional types were to be found. Special classes recommended for gifted children.

1914-15. Special classes in Michigan for mentally exceptional children (C. S. Berry, Report of Supt. of Public Instruction, pp. 57-75). Discussion of the arguments for and against the formation of special classes for gifted pupils.

1916. Announcement of the appropriation by the General Education Board for the use of Professor Guy M. Whipple, of the University of Illinois in the study of gifted children. Professor Whipple will endeavor to find out how early in their school life gifted children can be distinguished and how much school time and energy they can economize as well as how much additional training and mental equipment they can obtain through their school years. (Note. *Elementary School Journal*, September.)

1917. Announcement of an appropriation by the General Education Board to provide Teachers College of Columbia with funds necessary to establish and conduct a school for the purpose of constructive work in the reorganization of elementary education. "The subject of mathematics will receive special consideration in the hope of working out a rational course of study which connects the study of mathematics with its use, and which also makes adequate provision for those who have special ability or desire for this subject." It is expected that the school will open with part of its classes in the fall of 1917. Both boys and girls from six years of age and up will be admitted. (*Elementary School Journal*, February.)

1917. Report of the experiment undertaken jointly by Teachers College and the New York City Board of Education at Speyer School. Beginning with 1915-16 there were admitted to the school 200 seventh grade boys who indicated, with the approval of their parents, their intention of taking the Latin course in high school. These boys were divided into classes of 25 each on the basis of extended mental and educational tests, supplemented by the subsequent judgments of their teachers. The aim was to secure as nearly homogeneous groups as possible and to adjust the work of the class to the capacities of the pupils. . . . The brighter groups will undoubtedly be able to do three years' work in two, while the *duller ones will have gained a better mastery* of the material than if they had been swallowed up in the ordinary mixed class. This attempt to employ mental tests in securing homo-

geneous groups is a significant step in educational procedure. (*Journal of Educational Psychology*, March.)

1917. The Arlington Plan of grouping pupils according to ability in the Arlington High School. (Frederick E. Clark. *School Review*, Jan.). Discussion on the basis of six years' successful operation in Arlington, Mass.

1917. The Supervisor's use of standard tests of efficiency. (J. Coyce Morrison. *Elementary School Journal*, Jan.). "*The bright pupils need if anything more attention than the slower children.* On the basis of these tests during the year several pupils have been permitted to skip a grade. . . . There are 18 others who are receiving special attention from teachers in order that they may be able to do three years' work in two years. . . . Arrangements have been made whereby one teacher can give at least one third of her time next year to the coaching of accelerate and backward children. She will take *special training* during the summer for the work and will co-operate with the regular teachers in caring for these special pupils. *The majority of her time will be given to the brighter pupils.*"

In order to determine the present situation in regard to school provision for bright children the following questionnaire was sent out in April to the Superintendents of Schools in the cities indicated.

1. What provision are you making in your school for exceptionally bright children?
2. How many special teachers of Arithmetic have you in the elementary grades?
3. Have you a supervisor of Arithmetic?

The replies to question 1 were as follows:

Atlanta, Ga.—"Semi-annual promotions and opportunity to advance as rapidly as possible."

Baltimore, Md.—"Promotion at any time. In many cases children complete the eight year course in seven years."

Boston, Mass.—"Rapid advancement classes." Started in 1913.

Chicago, Ill.—"No provision."

Cincinnati, Ohio—"Special academic class" announced for Sept., 1917. "No other provision."

Cleveland, Ohio—"Advancing by division and by individual promotions as rapidly as possible."

Detroit, Mich.—"Special advanced class. The aim is not to hurry the children through school by covering ground more rapidly but to give fuller, richer courses." Started Sept., 1915.

Harrisburg, Pa.—"Special schools for these pupils for sev-

eral years when we had a nine-year elementary course. Since we have had an eight-year course we have not maintained separate rooms and teachers for these pupils. Now we use the fast and slow section method."

Indianapolis, Ind.—"In the lower grades we try to group children according to their capacity and allow them to progress as fast as they can do the work satisfactorily. In the upper grades we frequently select classes of unusually bright children and permit them to do two years' work in one and one-half years or thereabouts. Since our grades are but one-half year apart in their work we frequently permit individual pupils or groups of individual pupils to do the work of two grades simultaneously when this arrangement can be made."

Kansas City, Mo.—"Seven year elementary school organization makes it possible for the exceptionally bright children to save a year's time."

Lincoln, Neb.—"McKinley Preparatory School established in 1909, provides for exceptionally capable children."

Los Angeles, Cal.—"They are always given opportunity to work ahead in the next grade and are encouraged to do so. We also have *ungraded classes* in which bright pupils may work ahead."

Nashville, Tenn.—"Principals may promote children at irregular times if they believe them capable of doing advanced work."

New Orleans, La.—"No special classes. Special promotions on recommendation of teacher and principal."

New York City—"No special provision except to allow principals to organize classes for rapid advancement. Each principal is at liberty to have a teacher take her class over three terms' work in two terms."

Oakland, Cal.—"We have formed a few classes in the upper grades where we try to secure more than the normal rate of promotion."

Philadelphia, Pa.—"No special provision except that children may be promoted at any time during the year. Last year there were 6,545 incidental promotions of this kind during the two terms."

Rochester, N. Y.—"We have a number of classes for the exceptionally bright children in various schools and in one of our high schools."

St. Louis, Mo.—"No special classes but opportunity for rapid advancement through frequent individual promotions and by means of quarterly promotion scheme."

San Francisco, Cal.—"We let them cover two grades in a year if their progress and ability justifies this."

Seattle, Wash.—"We have auxiliary teachers in a number of the buildings who assist pupils capable of making up a semester's work. In all schools exceptionally bright pupils receive additional help in order that they may advance as rapidly as they are able."

Washington, D. C.—"Exceptionally good pupils from the seventh grade whose parents are willing for them to do extra work, and whose teachers recommend the trial are given the opportunity to make the eighth grade in half a year. The most of these are able to do so without difficulty." Special class organized in 1912.

Worcester, Mass.—"At the end of the sixth grade work we offer Latin and French or German to brighter pupils in addition to their regular work. Less attention is given to technical English grammar."

Of the twenty-three school systems, thirteen cities specifically indicate special class organization. Chicago is the only city to report no provision. Detroit alone emphasizes the general development of the gifted child rather than acceleration of his school work. The provision made by the remaining twenty-one cities for bright children may be summarized by the following six types in all of which economy of time is an important if not the primary object.

1. Special ungraded classes. (Los Angeles.)
2. Auxiliary teachers. (Seattle.)
3. Introduction of additional work into the elementary grades. (Worcester.)
4. Rapid advancement classes. (Boston, Cincinnati, Indianapolis, Lincoln, New York City, Oakland, Rochester, Washington, D. C.)
5. Fast and slow divisions. (Cleveland, Harrisburg.)
6. Irregular promotions. (Atlanta, Baltimore, Kansas City, Nashville, New Orleans, Philadelphia, St. Louis, San Francisco.)

Public sentiment in favor of making any provision for exceptionally bright children has been slow in developing. In April, 1915, the Michigan Superintendent of Public Instruction sent out a questionnaire to the school superintendents of all cities and towns of Michigan of 1,000 inhabitants and over, and included the following question:

"Do you believe in the formation of special classes for exceptionally bright children? Give reasons for your answer."

Dr. Berry has made a detailed summary of the replies with arguments for and against such grouping(1). Of the 217 replies only 58% advocated organizing such classes, 23% were

opposed and the remaining 19% were undecided or failed to answer.

In April, 1917, thirty-five teachers representing grades from the first through the eighth, and twenty-one teachers of high school mathematics replied to a questionnaire relating to the grouping of pupils according to ability. Of these fifty-six teachers, fifty expressed the opinion that grouping would be to the advantage of pupils of superior ability and six were opposed to such grouping. Thirty-two teachers thought that pupils of less ability would benefit by such groupings, twenty-two believed that it would not be beneficial, while two were doubtful. The replies from these fifty-six teachers indicate considerable scepticism in regard to the benefits derived by poor sections as a result of grouping and much experimental evidence is needed to confirm that of schools which have already found grouping successful. The report of the Speyer School, New York City, (*Jour. of Ed. Psy.*, 1917, p. 182), is significant in showing that the duller groups as well as the superior pupils gained as a result of this grouping. In the Arlington plan of grouping pupils(4) in slow, average and bright sections it was found that the slow and bright sections benefited while the average sections probably neither gained nor lost. In 1912 the Ann Arbor High School experimented with a class of failures, but did not regard the grouping as a success and similar experiments have not been tried since. In the High School of Cass City, Michigan, at the end of the first semester, this year, a class was made up of failures in plane geometry and the grouping was found to be beneficial. Grouping according to ability has been reported in Menominee, Michigan, and in Ithaca, New York. While interest is being shown by teachers in the elementary and secondary schools in the question of grouping, University professors are less ready to recognize the existence of a similar problem relating to freshmen students.

With the whole question of grouping still in the experimental stage it is not surprising to find that little has been done in determining the most advantageous grade for the introduction of grouping. As far as reports at hand indicate classes are not now being organized for children of superior ability earlier than the seventh grade. The McKinley Preparatory School, Lincoln, is made up of pupils from every Sixth A and Seventh B grade in the city. The "advanced classes" in Thirkell School, Detroit, are doing seventh and eighth grade work. The question of the organization of such classes earlier in the elementary grades seems not to have been considered in Detroit. The two teachers of these special

classes at Thirkell School do not advocate such grouping earlier than the sixth grade even though it might be possible to surmount the difficulties which are obviously very great in a city the size of Detroit. It is significant, however, that of 35 teachers representing all the grades from the first through the eighth, three who thought grouping according to ability would not be to the advantage of superior pupils were seventh and eighth grade teachers. With the growing emphasis on the early education of the child, it would seem logical to introduce grouping much earlier than has yet been done.

Closely involved with the problem of the grouping of bright children is that of the size of the group. The replies of fifty-seven teachers to the following question indicate the wide divergence of opinion and the necessity for experimentation:

"How small a class of exceptionally bright pupils would you consider ideal for accomplishing the most for the individual?"

- 1 advocated class 6-10.
- 20 advocated class 10-15.
- 30 advocated class 15-20.
- 5 advocated class 25-30.
- 1 advocated class 35.

The classes in Thirkell School, Detroit, and in McKinley Preparatory School, Lincoln, are each twenty-two in number. The special class in Washington, D. C., has forty pupils.

While the question of grouping according to ability, the size of the group, and the age for introduction of grouping are problems of prime importance from an administrative standpoint, perhaps none is so fundamental for the development of the gifted child as the problem of the content of the course itself. The conservative fear any attempt to crowd a precocious child in his school work. The reformers are urging the necessity for greater economy of time.

It is significant that of the twenty-three school systems listed in answer to the first questionnaire, Detroit is the only one in which emphasis is placed on "providing more material and covering it more rapidly," as quoted from the report (5) of Miss Elizabeth Cleveland, director of the "special advanced class." If it is desirable that these special advanced classes be organized chiefly with a view to saving time, then the course in mathematics will obviously not differ in amount from that ordinarily given. If, however, the grouping of bright children is introduced in the first elementary grade, there will be involved a correspondingly greater conservation of enthusiasm, interest and energy as well as of time and it

should be possible to enrich the course in many directions. Under such circumstances it would be possible to modify the instruction in mathematics more effectively than even the most ambitious reform is now attempting for non-homogeneous groups.

One of the problems which the precocious child has to meet is that of being associated with older and more mature children with whom he is not altogether companionable. Anyone who has followed the careers of the precocious children who have been much discussed in the papers(6) must feel dubious about the scheme of education of which they are demonstrating the results. By grouping children of exceptional ability during their secondary school education this problem will obviously be merely postponed until they complete their high school course. Parents will then need to provide a solution for the next step in the education of the child whose acceleration has prepared him for the University much younger than the average. The opportunities for the symmetrical and harmonious all-round development of the child, which Miss Cleveland hopes to provide in the "advanced classes" at Thirkell School, and which the Phebe Thorne Model School, Bryn Mawr, Pennsylvania, offers for the normal child are a happy solution of this particular problem. On the other hand, economy of time is urged by Dr. Flexner in "A Modern School."(8) He says: "Not only do American children as a class fail to gain either knowledge or power through the traditional curriculum—they spend an inordinately long time in failing. The period spent in school and college before students begin professional studies is longer in the United States than in any other western country. An economy of two or three years is urgently necessary." At the same time professional schools are becoming more and more highly specialized and there are those in Engineering Schools, for example, who recommend entrance at nineteen, giving a boy opportunity to do practical work after graduation from high school in order to determine his interests and qualifications.

The courses of instruction as announced for special classes of bright children do not indicate any readjustment in Mathematics. Superintendent Condon announces the following curriculum for the "Special Academic Class" to be organized in the Lafayette Bloom Junior High School, Cincinnati in September, 1917:

<i>Subject</i>	<i>Hours</i>
Physical Training and Hygiene	5
Latin or First-year German	5
General Science	5

Mathematics	5
English	5
Music	$\frac{1}{2}$
Penmanship	$\frac{1}{2}$
Drawing	2
Household arts (girls)	
Industrial arts (boys)	2
	<hr/>
Total	30

In the McKinley Preparatory School, Lincoln, the course of study is the same as in the regular seventh and eighth grades except that music and art are omitted and the addition of one year of high school work is done during the two years in preparatory. In the special class for bright pupils, Washington, D. C., the instruction in mathematics "does not vary at all from that given in ordinary class work." In the Thirkell School, Detroit, the "advanced class" does the regular seventh and eighth grade arithmetic and in addition one semester's work in Algebra with a good start on the next, in two years.

The growing dissatisfaction with the present curriculum in mathematics and the widening movement for reorganization of subject matter and psychologizing the presentation are factors that should result in special application to the interests and needs of the child of exceptional mathematical ability. Since 1903 the University High School, Chicago, has been developing a solution of the problem of reorganization of mathematics along lines of correlation. The course of study is outlined in detail by E. R. Breslich and others in *School Review* (Nov., 1916). "In three years the student has accomplished the work usually given in three and one-half years, due mainly to the correlation of the various subjects of mathematics, to the reorganization of material usually taught during the first three years, and to the training obtained through supervised study." The pupil, gifted in mathematics, seems well provided for in this high school course which, in the third year, lays the emphasis mainly on algebra and trigonometry and in the fourth year offers a semester of college algebra supplemented by reading and reports. It is significant that the outside preparation expected of the students is an average of fifteen minutes a day, the first year, thirty minutes for the second year, and thirty-five minutes a day for the third and fourth years. An average of fifteen minutes of the one hour class period is devoted to supervised study. The courses are uniformly five class periods a week.

The following extracts from periodicals indicate along what line pioneers in teaching classes of gifted children may revise

the instruction in mathematics and yet be in harmony with educational movements:

"It is evident from this report that the impression is entertained in many quarters that the arithmetic as now taught in the seventh and eighth grades is not satisfactory. Clearly implied also is the position that the introduction of higher mathematics will encounter some difficulty and that the subject matter of algebra and geometry must be largely reorganized before it can be used in the lower schools. . . . It may be predicted with great assurance that in the long run geometry will be found to be a very practical and stimulating subject for students of the Junior High School age. Such a modification of the mathematics course as would follow the introduction of geometry in this intermediate school would serve large intellectual and social purposes."(7)

"Elementary school courses are ejecting extraneous material thus placing emphasis on minimum fundamental essentials of Arithmetic. Assuming that the primary grades by means of informal games and other familiar devices inculcate fundamental number combinations, the fundamental essentials of Arithmetic may be thoroughly taught in four or at most five years. The facts submitted by certain schools no longer permit us to regard this as an experiment."(15)

"For the present we should devote our best efforts to the organization of a course—very flexible and very alluring—in general science for youths from twelve to fifteen years of age. One hopes that a similar course in mathematics could be worked out but with the traditions of that subject crystallized as they now are, the situation seems hopeless. Certainly from the point of view of any sound theory of liberal education the thing is possible and most highly desirable."(18)

"To a very considerable degree general mathematics will be found to facilitate the educational movement to provide for individual differences in ability and rate of progress. . . . An important movement is epitomized by the advent of the junior high school which is going to force the adoption of general or union mathematics. . . . General mathematics is in harmony with the attempt to organize a course of instruction which shall be properly graduated and progressive from year to year with close regard to maturing abilities of pupils."(13)

Twenty-two university and high school instructors in mathematics answered the following question in April, 1917:

Given a class of exceptionally bright students, and with no consideration for the practical difficulties involved, would you cover the ground in less time or enrich the course? The work

might be arranged by terms for sections of superior ability and by semesters for classes of less ability.

Course	No. who advocate completing in less time	No. who advocate enriching the course
Elementary algebra..... $1\frac{1}{2}$ units.....	7	15
Plane geometry.....1 unit.....	10	12
Solid geometry..... $\frac{1}{2}$ unit.....	10	12
Trigonometry..... $\frac{1}{2}$ unit.....	8	12
Plane analytic geometry...3 semester hrs.	4	14

It will be seen that there is no uniformity of opinion to guide the reformer who is revising courses in mathematics for bright pupils. One university professor believes that the college entrance requirement is sufficient preparation for more advanced work and therefore there is no need to enrich the courses if they are thoroughly mastered. Another professor believes that bright pupils would profit by the addition of a large number of problems and exercises and therefore he does not advocate completing the course in less time. Both professors have sons who are gifted in mathematics and are completing their secondary education at an age younger than the average.

With the revision of subject matter must come also training of teachers, especially of those engaged in secondary mathematics, which has been called the most serious mathematical problem in America to-day.(11) In the mathematical survey of the Chicago school system in the spring of 1914 the committee reported more favorably on the teaching of arithmetic in the elementary schools, than on the teaching of mathematics in the high schools.(19) The preparation of mathematics teachers of various grades was to have been the main topic of discussion at the conference of the "International Committee on the Teaching of Mathematics" to have been held in Munich, Germany, August, 1915. Dr. Flexner points out clearly the present failure in Mathematical instruction:

"In examinations held by the College Entrance Board in 1915, 69.7% of those examined in algebra from quadratics on failed to make as much as 60%; 42.4% failed to make 60% in plane geometry. What would the record be if all who studied these subjects were thus examined by an impartial outside body? . . . It is therefore useless to inquire whether a knowledge of Mathematics is valuable, because pupils do not get it; and it is equally beside the mark to ask whether the effort to obtain this knowledge is a valuable discipline, since failure is so widespread that the only

habits acquired through failing to learn Latin or algebra are habits of slipshod work, of guessing and of mechanical applications of formulas, not themselves understood.(8) Mr. E. R. Breslick also recognizes the present need of reform. "The failures in mathematics as recorded show a very much higher percentage than in most of the other subjects of the curriculum. . . . We must admit on the basis of scientific studies that it is extraordinarily difficult, even for good teachers, to keep mathematics in the high school at the same level of success as the other subjects that are taught."(3)

While it is generally recognized that there must be specially trained teachers for classes of backward and delinquent children, yet the exceptionally bright child has received only incidental and usually very haphazard attention. The organization of mathematics clubs such as those in Marion, Ohio(9) and in Hyde Park High School, Chicago,(17) offers one solution of the problem "What shall we do for the bright students?" The University High School, Chicago, has endeavored to make provision for students gifted in mathematics by its organization of mathematics contests,(16) its generous mathematical equipment, (20) and by proper library direction of supplementary reading. These various devices may constitute a part of the larger technique that needs to be developed to direct in the most efficient way the enthusiasm and the energy of the fast worker in mathematics.

Only seven of the twenty-three cities listed in answer to the first questionnaire report special teachers of Arithmetic in connection with departmental work, Cincinnati having 25 and New Orleans 60. The only supervisor of arithmetic is reported by East Cleveland, Ohio, where Superintendent Kirk finds a supervisor necessary in order to train teachers in the Speer method of teaching Arithmetic. The reorganization of subject matter with the introduction of new methods and text-books(10) urges the necessity for a more universal introduction of departmental work with teachers specially trained in mathematics. The need of a supervisor is more apparent during our present experimental stage of mathematical reform than it has been in the past. While the grouping of students in slow, average, and bright sections promises to meet some of the difficulties which confront mathematical instructors, other problems are introduced for which the co-operation with a supervisor would be invaluable.

Much experimental work is being done in establishing standards in arithmetic and incidentally the bright child is profiting by this growing emphasis on the individual training which the use of all standard tests accomplishes.(12). Tests in stand-

ardization are also being applied to the teaching of algebra and a definitely worked out experimental plan has been published by H. O. Rugg of the School of Education of Chicago. (14) Standards designed for non-homogeneous groups of children will require revision to be most effective when applied to slow, average and bright sections.

One of the most important phases of experimental work is that of standardizing tests for the measurement of general intelligence. The teachers of the "advanced class" in Thirkell School, Detroit, regard the selection of the children as one of their most difficult problems and one in which they have not been altogether successful. Mr. S. T. Courtis is revising tests for the selection of these pupils of superior ability.

In conclusion it is seen that a course in mathematics for students of superior ability must be harmonized with present educational reforms. It must be built up as part of a carefully constructed scheme which is yet to be evolved with the scientific help of the experimental educator. Before courses can be planned satisfactorily for the gifted child in mathematics or in any other subject, the following problems must be solved:

1. Revision of tests for measuring general intelligence.
2. Determination of the time required for the elementary and secondary education of the gifted child, involving either an enrichment or acceleration of the present school course. (2)
3. Determination of the earliest grade in which the gifted child will profit by grouping.
4. Size of class most advantageous for the individual child.
5. Amount of drill necessary for superior students.
6. Standards for superior students.
7. New texts in the elementary and secondary schools.
8. Teachers trained in new technique.

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BOOK NOTES

The essentials of child study, including class outlines, brief discussions, topical references and a complete bibliography. By G. W. A. LUCKEY. Chicago, University Publishing Company, 1917. 219 p.

This work is dedicated to the children, and is the outgrowth of twenty-one years of experience in teaching the subject in the University of Nebraska. It represents the nucleus of a three-hour college course for one semester of eighteen weeks, fifty-two periods of fifty minutes each. It is used as a text in a beginning course in child study. The bibliography is confined almost entirely to references in English. It should be helpful also to teachers and parents. Among the thirty-three chapters are, The Beginning and Scope of Child Study and Its Importance, Birth, The Physical Child, including Health, Growth, Nervous System, Senses, each of which is given a chapter; Feelings, to which four chapters are devoted; and then comes Knowing, with an outline of the psychology of the intellect and the functions of memory, intelligence, judgment, types of children's drawings, language, laughter, order of interest in literature, methods of study, fatigue, and finally, moral and religious training and the music sense of children. One very important feature of the book is the many pages of quotations from various authors. The work is practical and should be in the hands of every thoughtful teacher. Much of it is more or less schematic. It would be very easy to criticize such a book. Of its very nature it cannot be complete, for the subject is far too vast. We should have been glad, for instance, to have a little historical perspective, but of this the author gives us nothing. It is another subject. We should have thought that even according to this plan of the book more attention should be given to the development of language, while in fact we have barely three pages of the text, but the references are copious. The merits of such a book depend entirely upon the author's sense of perspective and here Professor Luckey has shown remarkably good judgment. The book, too, is timely, and ought to do very much to give child study the place it deserves, but often lacks. The real importance of the Nebraska work will only be seen in its proper proportions from the viewpoint of the future historian in this field.

The dynamic of manhood. By LUTHER H. GULICK. New York, Association Press, 1917. 117 p.

The original text of this book has been submitted to specialists in various fields, and to these the author acknowledges his indebtedness. The book assumes that the two major motives are two heart-hungers, first, to benefit self, second, to benefit others. The hunger for a friend leads him to discuss loneliness, loyalty, the effects of friendship and the discovery and transmission of character. The hunger for woman, which begins in "spooning," is a great factor in the development of the feelings, and he discusses monogamy, autoerethism, early marriage, etc. The chapter on hunger for children dwells upon the differences between the father and the mother, the right to be born and well born, and the characteristics of a good father. The hunger for God is directed to nature and its origin; the book closes with the author's conception of a living, personal God.

The play movement and its significance. By HENRY S. CURTIS. New York, Macmillan Company, 1917. 346 p.

This volume is the fourth in the author's series and its aim is to give a concrete picture of the extent of the development of play in this country, of the sources from which the movement has sprung, and the direction in which it is going. One of the most interesting chapters is on play at the school, which has taken many different forms. The municipal playground movement is treated concretely, with special descriptions of playgrounds at Chicago, Philadelphia, Oakland and other cities. Public recreation is another large theme. The chapter on Other Places to Play; what is done in vacant lots, on roofs, in apartment houses, on promenades, streets, etc., is interesting. Then follow chapters on Play for Institutions, Play in the Country, Equipment and Supplies, which gives practical information of great value. The chapters on the Boy Scouts and the Camp Fire Girls are a little more perfunctory, as they have been described elsewhere. The chapter on The Recreation Survey is very properly followed by one on What Is the Cost?

An introduction to high school teaching. By STEPHEN SHELDON COLVIN. New York, Macmillan Co., 1917. 451 p.

This work is designed to give practical help to those in our colleges and universities soon to enter the work of high school teaching. It emphasizes particularly the general methods of instruction as they apply to high school. It deals little with organization or administration. It assumes that all instruction should be definite, with a wealth of illustration and practical illustrations. A select bibliography at the end is of great aid, while the appendix has a detailed outline. The author first treats the Outline, Scope, then the High School Pupil, Teacher, Question of Discipline and Indirect and Direct Control, The Function of Punishment, Eliminating Waste from the Class Room, the Methods of the Class Period, Teaching Knowledge of the Pupil, Nature and Function of Drill, Its Educational Methods, Acquiring New Knowledge through Oral and Book Instruction, through Illustration and Demonstration, Other New Knowledge and the Stimulation of Thought, by Inductive and Deductive Development, the Question Lesson Plan, and Supervised Study.

Self-surveys by colleges and universities. By WILLIAM H. ALLEN. Yonkers-on-Hudson, World Book Company, 1917. 394 p.

This country, we are told, spends half a billion dollars yearly on higher education to shape democracy's ends, and this volume attempts to tell institutions how they can increase their own efficiency and make our 600 colleges and 400,000 students more helpful to the highest development of the country. Accordingly, the author first gives a brief account of the survey moment in higher education; then follows the procedure for a cooperative college survey; the relations of trustees to president and faculty; executive and business efficiency; faculty government; extra-curricular activities of students; course of study; instructional efficiency; relation of college communities. This book, like its companion above, is copiously illustrated, and contains such a vast body of helpful information that it should be in the hands of every college administrator.

Self-surveys by teacher-training schools. By WILLIAM H. ALLEN AND CARROLL G. PEARSE. Yonkers-on-Hudson, World Book Company, 1917. 207 p.

This book is written on the assumption that no enterprise in this country is so important to its future welfare as teacher-training, and that this is the great need. Hence the authors first proceed to analyze the problem and present conditions. There is first the reason for self-surveys; then an account of pathfinding by Wisconsin's normal schools; this is followed by chapters on Steps in Making a Self-Survey, Administration Problems, Course-of-Study Problems, Supervision Problems, Instruction in the Academic Department, Training Department's Training, Extra-Curricular Activities of Students, Technique of Reporting Surveys, General Needs of Teacher-Training Schools, and Exhibits. The book is the most interesting and competent in its field and is enlivened by many photographic and other illustrations.

A survey of a public school system. By HENRY LESTER SMITH. New York, Teachers College, 1917. 304 p.

There is first a preliminary discussion of the community and the plan of a school survey; then normal progress, retardation and acceleration. The third chapter takes up the census, enrolment, promotion, failures, withdrawals and repetitions; then follow chapters upon finances, course of study, achievements of pupils, teachers, supervision of instruction, school buildings, recommendations, and criticisms of the Bloomington school survey.

Practical child training. Book I, Early Lessons for teaching obedience in the home. By RAY C. BEERY. Pleasant Hill, Ohio, International Academy of Discipline. 294 p.

This is not a collection of observations but seeks to show parents just how to develop certain desirable traits in children. It is a parents' manual and the course is comprised in four volumes, this being the first. The introductory chapter explains the five most important principles upon which the system rests. Then follow detailed lessons in teaching obedience from infancy to mature life. Parents must actually teach these lessons to their children. Book II contains early lessons in self-control; Book III is on the training of the body; Book IV, early lessons in morality. Together they cover most of the points of discipline which from time immemorial have troubled anxious parents. A story is often used as an illustration. The work is illustrated by several full-page photographs. The book instructions are supplemented by a correspondence department.

The progressive music series. Books one, two, three and four; teacher's manual, volumes one, two and three. Boston, Silver, Burdett and Co., (c. 1916, 1917).

The teaching of music has long been in a bad way. It was established in the schools of this country by men who were very mechanically-minded in music and at the same time obsessed by the idea of progressive logical stages. Few topics have been taught with less reference to the nature and needs of the child, on the one hand, or to the rich musical material to which he should be introduced on the other. In this formidably ponderous series of four big and three small volumes, we have a really epoch-making step taken towards better conditions. In the first place, the authors of this series realize that the child must sing and have quite a repertory of songs it knows by heart before it can profit much by learning to read music, whereas the old

idea was simply to begin with the staff. Again, the songs selected here are for the most part good and fit the needs and interests of the child. They are not selected, made or modified primarily with reference to logical gradation. The first three volumes of the large four apparently contain nothing but directions to teachers and the accompaniments, one by one, of the songs in the little books, which go from the second to the seventh grades, inclusive. These three volumes are teacher's manuals, in the first half of which we have a three-fold distinction which runs through everything, between the sensory, the associative and the adolescent period, and voluminous suggestions concerning appreciation, voice-culture, sight-reading, interpretation, conduct of musical recitation, with various graded outlines on tone, time, theory, etc. for different grades, while the third part is made up of nineteen chapters on such things as the quarter-note, beat, interval studies, simple song forms, etc. There are plenty of instructions for each month from the beginning, discussion of motifs and figures, the rhythmic sense, musical vocabulary, etc., with a glossary. Book Four starts in with music reading for adolescents and a lot of new songs. The editors of this series have even dared to select a few wordless dances, the number of which should have been greatly increased.

When the Heart of Oak series of school readers came out, the writer of this review thought it marked an important stage, because it stressed the kind of literature to be taught to children as no other series had ever begun to do. The same is true of this series. The kind of music it offers to the child is properly stressed and is the best of any series yet made accessible to children. Thus it marks a distinct and most wholesome epoch in musical pedagogy. To our thinking, however, there still remain two faults. First, the compositions of the editors themselves are far too prominent in number. This might be excusable for younger children, where there is less music to select from, but although some of these compositions are very good, those presented to the older children do not begin to compare with the best selections that might be made from the vast field of music so that we still have the trail of what has seemed in previous American music-books the ineffable conceit that music teachers themselves can vie with the great masters in composing things fit for children. The fact that the quality of these compositions is better than most of those written by the editors or contributors to series does not excuse the disproportionate number of these new creations. The other mistake of the books is due to the publishers' interests or instinct for padding. If ordinary intelligence and a little rudimentary training could be assumed for the teachers, the first three volumes of the larger books might be entirely omitted or vastly condensed.

Apprenticeship and apprenticeship education in colonial New England and New York. By ROBERT FRANCIS SEYBOLT. New York, Teachers College, 1917. 121 p.

This survey begins with the system in England, its transfer to New Plymouth, Massachusetts Bay Colonies, and its extension to Connecticut and New York. It is quite plain that the essential systems of the English practice were reproduced in colonial New England and New York, and elementary education could not satisfy the needs of the colonies; but it is significant that the legislative provisions are so many of them found in the poor laws. This system took care of the entire problem of public elementary education during the colonial period, for by these laws the scope of apprenticeship was vastly broadened.

The Lancasterian system of instruction in the schools of New York City. By JOHN FRANKLIN REIGART. New York, Teachers College, 1916. 105 p.

This is a very interesting monograph on an important topic. The survey begins with the school in New York in 1805 and the Free School Society. The author also describes the origin of the system, Sidney Smith's impression of it, the great lack of schools for the poor in that day, methods of teaching the various topics, including morals, training of teachers, etc. Perhaps the most original contribution is the story of the system in New York.

Negro education; a study of the private and higher schools for colored people in the United States. Prepared in cooperation with the Phelps-Stokes Fund under the direction of Thomas Jesse Jones, specialist in the education of racial groups, Bureau of Education. Washington, Government printing office, 1917. 2 v.

These very comprehensive folio volumes give us a broad survey of the entire problem. Under "General Survey" the author treats the elements of race development; financial support of negro students; type and grade of education, etc. Then follow chapters on the facilities, attendance, buildings, pupils, teachers, terms, high schools; under "Secondary Education," come college and professional courses, training of teachers, industrial and race education. Ownership and control, funds and associations, financial accounts, student records, buildings and grounds, history of negro education, are all treated *in extenso* in the first volume. The second volume gives a summary of educational facilities in different states. The work is illustrated by forty cuts and thirty maps and diagrams.

The city superintendent and the board of education. By WILLIAM WALTER THEISEN. New York, Teachers College, 1917. 137 p.

Under the caption, "The Board and Its Duties," the author treats the question of legal limitations and the work of board committees. Under "Administrative Organization," after justifying the need of a treatment, he discusses types and also administrative organization in other fields. The final theme is authority given the chief executive in matters of instruction and of business.

Standardized reasoning tests in arithmetic and how to utilize them. By CLIFF W. STONE. New York, Teachers College, 1916. 24 p.

This book discusses conditions and directions for using these tests; more fully, directions for scoring; and most fully, representing, interpreting and utilizing scores.

Educational sociology; a digest and syllabus. Part I: Introduction. Part II: Applications to curricula and studies. By DAVID SNEDDEN. New York, Teachers College, 1917. 2 v.

The author here gives us a very interesting and full digest and syllabus of his course of study, which is very comprehensive and must be of high value.

Teacher training agencies. By THOMAS E. FINEGAN. (Volume 2 of the 11th annual report of the State Department of Education.) Albany, University of the State of New York, 1917. 439 p.

This is an historical record of the various agencies of the State of New York employed in training and preparing teachers for the public

schools of the state. There are many illustrations of men, buildings, graduate classes, etc., and it is very interesting to see the faces of past and present leaders with whose names one has long been familiar, as well as of many who are unknown outside their own circle. The work, in fact, is a veritable picture and portrait gallery.

An introduction to special school work. By MARION F. BRIDIE. New York, Longmans, Green and Co., n. d. 238 p.

The most important chapters in this work are those entitled Preparatory Class, Sense Training, Reading, Oral Lessons, A Manual Oral Class, Number Work, Physical Training, Junior Manual Training, Vocational Training for Boys and Girls, and School Organization.

Proceedings of the fifty-second convocation of the University of the State of New York, Albany, New York, October 19 and 20, 1916. University of the State of New York, 1916. 222 p.

The chief themes treated at this session were the Written Word (four papers), the Printed Word, American Speech, and the Junior High School.

Standards in English. By JOHN J. MAHONEY. Yonkers-on-Hudson, World Book Company, 1917. 198 p.

This book first outlines a course of language by grades, from the first to the eighth, inclusive. We then have a literature outline, while the appendix contains a picture list, common errors, their correction, model letter-forms, and the allotment in language.

Annual report of the Rockefeller Foundation, 1916. New York, Rockefeller Foundation. 458 p.

This is an official report of the directors of the different departments of the Rockefeller Foundation, which presents in a very impressive way the varied activities of this unique institution.

The mythology of all races. Ed. by Louis Herbert Gray. Volume VI, *Indian*, by A. BERRIEDALE KEITH. *Iranian*, by ALBERT J. CARNOY. Boston, Marshall Jones Company, 1917. 404 p.

The first 253 pages of this book are devoted to the Indian and the remainder of the volume to the Iranian mythologies. The first has chapters on 1. Gods of Sky and Air; 2. Of Earth, Demons, and Dead; 3. The Mythology of the Brāhmanas; 4. The Great Gods of the Epic; 5. The Minor Epic Deities and the Dead; 6. Mythology of the Purānas; 7. Buddhist Mythology in India and Thibet; 8. The Jains; 9. Mythology of Modern Hinduism. The Iranian chapters treat of 1. Wars of Gods and Demons; 2. Myths of Creation; 3. The Primeval Heroes; 4. Legends of Yima; 5. Traditions of the Kings and Zoroaster; 6. The Life to Come. There are several dozen illustrations of various kinds, many colored, which give added interest to the volume. The writers of both these mythologies are men of competence, and they have brought together much interesting and well-chosen material. One cannot, however, escape the suggestion that the work on Indian mythology is so much more important and interesting than the Iranian, that most people would have preferred more relative space given to the former.

Health charts. Proposed by the joint committee on Health Problems in Education of the National Council of the National Education Association and the Council on Health and Public Instruction of the American Medical Association. Prepared by Dr. Thomas D. Wood. New York, 1917.

This is an excellent collection of all kinds of diagrams, pictures, mottoes, curves and schedules, bearing upon health, many of which ought to be in every school, although they seem to the reviewer to have very different degrees of merit.

Health essentials for rural school children. Proposed by the joint committee on Health Problems in Education of the National Council of the National Education Association and the Council on Health and Public Instruction of the American Medical Association. Prepared by Dr. Thomas D. Wood. New York, 1917. 23 p.

Annual report of the Surgeon General of the Public Health Service of the United States for the fiscal year 1916. Washington, Government Print. Office, 1916. 421 p.

Department of the Interior, Bureau of Education. Lessons in community and national life. Community leaflet, Nos. 1-3. Lesson A-1. Some fundamental aspects of social organization. Lesson B-1. The effect of war on commerce in nitrate. Lesson C-1. The war and aeroplanes.

The curriculum of the Horace Mann elementary school. By the Teachers of the Horace Mann elementary school. New York, Teachers College, 1917. 138 p.

Current practice in city school administration. By W. S. DEFFENBAUGH. (Bulletin, 1917, No. 8). Washington, Government Print. Office, 1917. 98 p.

Demand for vocational education in the countries at war. By ANNA TOLMAN SMITH. (Bulletin, 1917, No. 36). Washington, Government Print. Office, 1917. 16 p.

Teachers College bulletins. Published by Teachers College, New York, 1917. (Technical Education Bulletins, Nos. 30-34.)

Economical diet and cookery in time of emergency. By MARY SWARTZ ROSE, CORA MARGUERITE WINCHELL and BERTHA E. SHAPLEIGH. 8 p.

Simple lessons on the physical care of the baby. By JOSEPHINE HEMENWAY KENYON. 19 p.

Lessons in home nursing. By ISABEL M. STEWART. 8 p.

How to plan meals in war time. By MARY SWARTZ ROSE. 15 p.

Ninety tested palatable and economical recipes. Compiled and tested by department of foods and cookery, Teachers College. 26 p.

My ideal of marriage. By CHRISTIAN D. LARSON. New York, T. Y. Crowell Co., (c. 1916). 109 p.

The woman who wouldn't. By ROSE PASTOR STOKES. New York, G. P. Putnam's Sons, 1916. 183 p.

Report of the conference on new ideals in education, held at Oxford, from July 29 to August 5, 1916. Published by the Secretary, 24 Royal Avenue, Chelsea. 267 p.

Recent books on the Kaiser.

The real Kaiser; an illuminating study. Anonymous. New York, Dodd, Mead and Co., 1914. 230 p.

The German Emperor as shown in his public utterances. By CHRISTIAN GAUSS. New York, Charles Scribner's Sons, 1915. 329 p.

The psychology of the Kaiser. By MORTON PRINCE. London, T. Fisher Unwin, 1915. 75 p.

Is the Kaiser Insane? A study of the great outlaw. By ARNOLD WHITE. London, C. Arthur Pearson Ltd., 1915. 160 p.

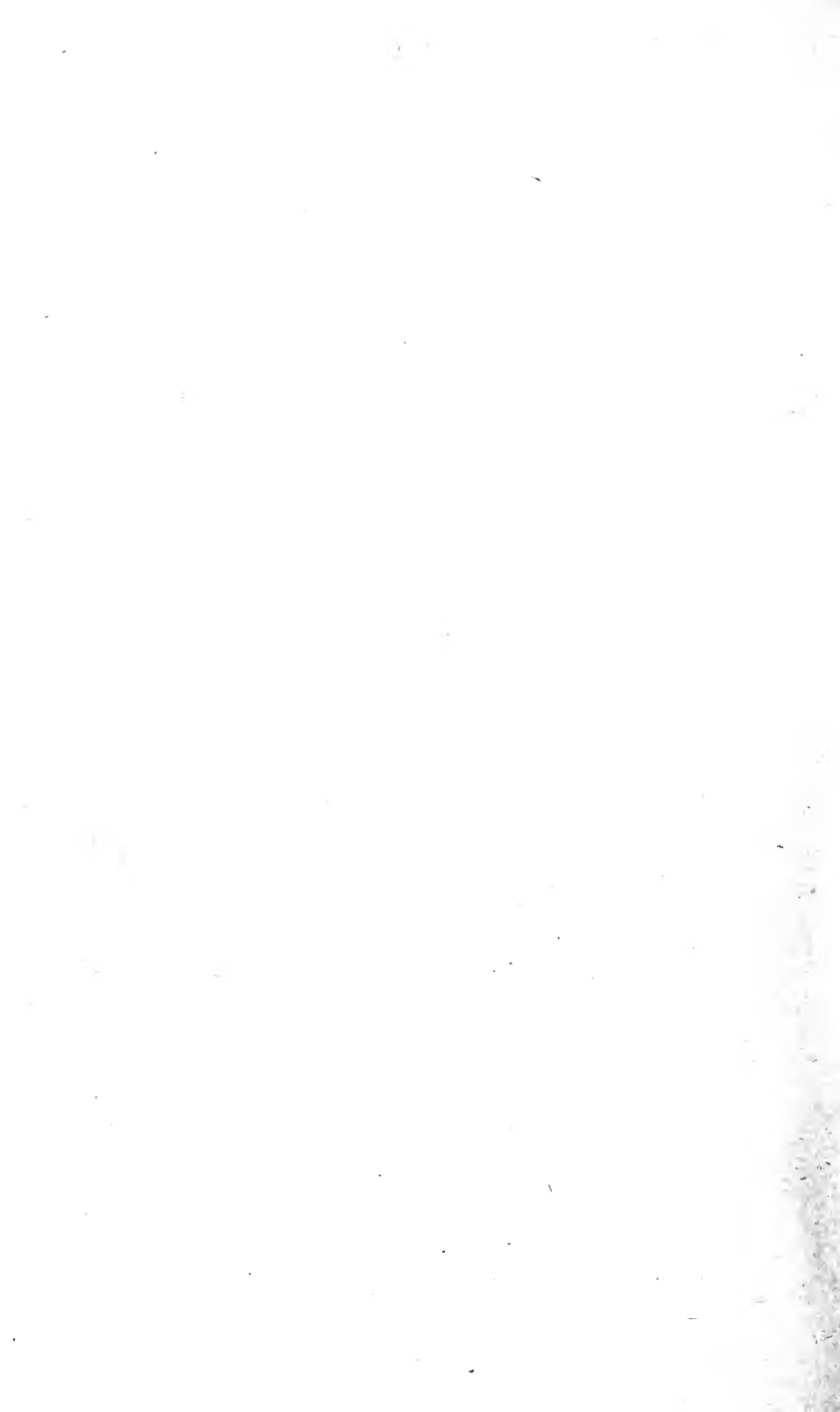
BUILDER and blunderer; a study of Emperor William's character and foreign policy. By GEORGE SAUNDERS. New York, E. P. Dutton and Co., 1914. 205 p.

Stories of the Kaiser and his ancestors. By CLARE JERROLD. London, Stanley Paul and Co., 1915. 194 p.

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The Bureau of Educational Experiments, 70 Fifth Avenue, New York City, since the appearance of their valuable leaflet on Playthings, issued as Bulletin Number I of their publications, has published other bulletins, among them the following: Bulletin II, Animal Families in Schools. Bulletin III, The Play School, New York City. Bulletin IV, The Children's School. Teachers College Playground. The Gregory School, West Orange, N. J. Bulletin V, The Stony Ford School, N. Y. They have issued also bibliographies of literature on psychological and pedagogical tests. This Bureau has permanent exhibits of school equipment for young children and of psychological test material, also traveling exhibits including a screen exhibit of the theory of the Gary school system, and a small exhibit of school equipment for young children.



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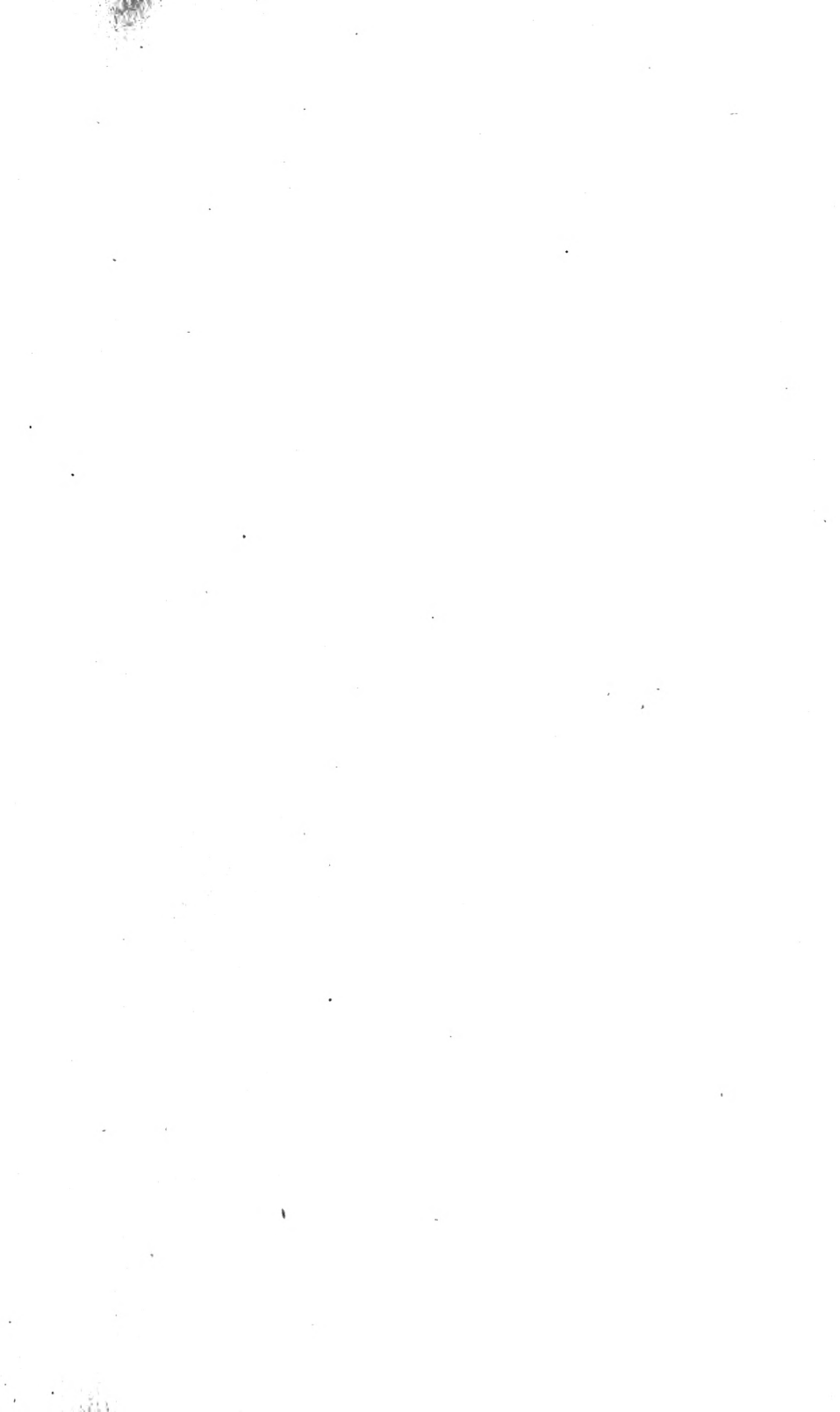
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