PHARMACEUTICAL JOURNAL

AND

TRANSACTIONS.

SECOND SERIES.

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THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. X.—No. I.—JULY, 1868.

PRESCRIPTIONS.

With the separation of prescribing from the dispensing of medicines, the necessity arose for some means of conveying the instructions of the physician to those by whom they were to be carried into effect. It was necessary to have a medium of communication for indicating the remedies to be administered in the treatment of disease. This medium of communication—the prescription—not only symbolizes the existence of pharmacy as an occupation distinct and separate from the practice of medicine, but at the same time it represents an advanced state of medical practice, in which all the energies of the practitioner are devoted to the higher departments of his profession, while the preparation of the prescribed remedies is left to those who make it their special business. The prescription, moreover, is a record of the treatment adopted, which, if necessary, might be appealed to, for the satisfaction of the patient or the justification of the physician.

It is essential that the instructions given in the prescription should be brief yet explicit,—that the terms used should be as little liable as possible to misconception, and that the preparation of the medicines ordered should not cause inconvenient delay in administering them. In providing for the accomplishment of these objects the Pharmacopœia is designed to supply such information as will render the terms used in prescriptions intelligible. To a great extent this has been accomplished, and most prescriptions are written in such a way as to admit of easy interpretation by reference to the Pharmacopœia.

It has been principally for the purpose of facilitating and rendering less liable to uncertainty the prescribing of medicines by means of written prescriptions, that the Pharmacopœias formerly used, and having separate and independent authority in different parts of the kingdom, have been superseded by the one national Pharmacopœia, which now occupies their place. The Pharmacopœia defines the medicines which are most frequently ordered by physicians, giving instructions for their preparation; and these being made beforehand, the dispenser is generally enabled with certainty and dispatch to mix and prepare for administration such remedies as are indicated in prescriptions.

If all prescriptions were written with reference to one recognized standard of interpretation, the medicines ordered and the method of ordering them being such, and such only, as the legally authorized Pharmacopœia describes, the duties of dispensers would be comparatively easy. But it is obvious that it would neither be possible nor desirable, in the existing state of medical knowledge, thus to limit the discretionary power of the physician in selecting the remedies to be applied in the treatment of disease. The curative art being essentially one of progressive development, of which, without disparagement, it may be said that more remains to be achieved than has yet been effected in establishing a sound and satisfactory system of treatment, the field for investigation must be left open, and means afforded for the trial of new remedies, as well as for testing the efficacy of those hitherto principally employed. It is here that the

difficulties both of prescribers and dispensers become most apparent. The physician naturally appeals to the pharmaceutist for assistance in devising new methods of combining or preparing remedies to be submitted to trial, and these, of course, in the first instance, may be unknown, excepting to those by whom they have been introduced. The prescription cannot always indicate the precise nature of the remedies ordered without referring to some authority for detailed descriptions, which could not be conveniently included in so brief a document as it necessarily is. If the reference be to some Pharmacopœia other than that which is legally recognized, or to some remedy of which an account has already been published, this should be clearly indicated in the prescription. But the remedy may be one of which no published account exists. Is the physician to be precluded from ordering such? It may be a remedy with reference to which even those who are using it are not yet satisfied that they have perfected the method of producing it, and this would be sufficient ground for objecting to its publication. But there are other obvious motives which are likely to come into operation in such cases. The chemist who has assisted in suggesting or preparing the remedy, and who may have spent much time and have otherwise incurred expense in experimenting on the subject, not unnaturally looks for some benefit in return, and therefore expects to be allowed exclusively to supply the remedy to others. There is nothing very unreasonable in this; but the question arises as to the best method of satisfying just claims of this description without injury to others, and without prejudice to the interests of the profession which may be implicated in such cases.

If the remedy be a new and unknown one, the name by which it is prescribed, and by which alone it can be designated in a prescription, may fail, as it probably would, to indicate its exact composition, or to supply sufficient information to enable those not otherwise instructed to prepare it. The true method of preparing it is known only to the chemist by whom the process was worked out experimentally. It may be a liquor or a syrup or a tincture, containing some very active ingredients,—strychnia or morphia, hydrocyanic acid or arsenic,—but the name gives no indication of the strength of the preparation; and if it be prescribed without further reference, much annoyance, if not serious injury, may result. A chemist has a prescription brought to him by a regular customer, in which a medicine such as we have alluded to is ordered. Is he to make up something that will answer to the name and not be inconsistent with the dose ordered? or shall he tell the patient that he has not the required information to enable him to prepare the medicine? or shall he refer to the physician for further information? The last-named course, which would be that usually adopted when practicable, may, in some instances, be impracticable, in which case the chemist may suffer in reputation, or lose his customer, or be tempted to prepare the medicine without sufficiently precise knowledge of the method of doing so. It is much to be desired that some more systematic and unobjectionable method than is now frequently pursued should be agreed upon and generally adopted in cases such as these. The prescription should, in every instance, give sufficient information, directly or by reference, to enable any qualified pharmaceutist to dispense it. If the names used be such as occur in the legally authorized Pharmacopœia, they should, of course, be interpreted according to that authority; if they are intended to refer to any other published authority, this should be clearly indicated in the prescription; and lastly, if a medicine is ordered, of which there is no published account, and only one authorized maker, the name of the maker should be appended, so that the medicine might be obtained from him when required for dispensing. By some such arrangement as this, the interests of all the parties concerned would be protected more completely than they were at present, and dispensing chemists would be spared the annoyance frequently experienced from the use of terms in prescriptions, the full signification of which is intelligible only to a favoured few.

TRANSACTIONS

OF

THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *June 3rd*, 1868,

Present—Messrs. Bourdas, Carteighe, Deane, Evans, Haselden, Hills, Ince, Randall, Sandford, Squire, Standring, and Williams.

Being the first meeting after the Anniversary, the following Officers of the Society were elected:—

GEORGE WEBB SANDFORD.....*President.*

HENRY SUGDEN EVANS .....*Vice-President.*

THOMAS HYDE HILLS .....*Treasurer.*

ELIAS BREMRIDGE .....*Secretary and Registrar.*

The following were appointed on the several Committees and Boards of Examiners:—

COMMITTEES.

General.—Messrs. Bourdas, Carteighe, Deane, Edwards, Haselden, Ince, Morson, Savage, Squire, Waugh, and Williams.

Special Purposes.—Messrs. Bourdas, Carteighe, Haselden, and Williams.

Finance.—Messrs. Bourdas, Carteighe, Haselden, and Williams.

Library, Museum, Laboratory and House.—Messrs. Bourdas, Carteighe, Deane, Edwards, Haselden, Hills, Ince, Morson, Squire, Waugh, and Williams.

Benevolent Fund.—Messrs. Bourdas, Carteighe, Hills, Waugh, and Williams.

Parliamentary.—Messrs. Bourdas, Carteighe, Edwards, Haselden, Hills, Morson, Randall, Squire, Waugh and Williams, with power to add to their number.

Journal.—The President, Messrs. Brady, Daniel Hanbury, Ince, and Morson.

Editors.—Chemistry and Pharmacy, Professor Redwood, Ph.D.; Botany and Materia Medica, Professor Bentley, F.L.S.; Commercial, Mr. Barnard.

BOARDS OF EXAMINERS.*

England and Wales.—Messrs. Abraham (Liverpool); Bird, Augustus; Brady (Newcastle); Carteighe; Cracknell; Darby; Davenport; Deane; Edwards; Gale; Garle; Giles (Clifton); Hanbury, Daniel; Haselden; Ince; Morson; Proctor, B. S. (Newcastle); Reynolds (Leeds); Schacht (Clifton); Southall, W. (Birmingham); Squire; Standring (Manchester); Wilkinson (Manchester); Woolley (Manchester).

Scotland.—Messrs. Ainslie, Aitken, D. R. Brown, Buchanan, Gardner, Kemp (Portobello), Noble, Young, and the Secretary Mr. Mackay. The President and Vice-President on all Committees *ex officio*, and on the respective Boards of Examiners in London and Edinburgh.

BENEVOLENT FUND.

The sum of Ten Pounds was granted to the orphan daughter of a late Member, at Southampton.

Resolved—That two Annuities on this Fund, of Thirty Pounds a year each, be offered for competition in October next, and that notice thereof be given in accordance with the regulations for the distribution of this Fund.

* Those not otherwise designated reside in London.

BOARD OF EXAMINERS, *June 17th*, 1868.

Present—Messrs. Carteighe, Darby, Davenport, Deane, Edwards, Evans, Gale, Garle, and Haselden.

Eighteen Candidates presented themselves for Examination; the following sixteen passed, and were duly registered:—

MAJOR (as Pharmaceutical Chemists).

*Foster, William.....Bridlington.
*Hibbert, Walter Griffiths.....Neath.
Lasham, John William.....Stratford-on-Avon.
*Lescher, Frank Harwood.....London.
*Moss, John.....Oldham.
Yates, Samuel Pearce.....Wellington.

MINOR (as Assistants).

Baissac, Eugène Jean Denis.....Mauritius.
Burbidge, Edwin.....London.
Chantler, William Rogers.....Newport Pagnell.
Cooling, William John.....Newark.
†Deane, James.....Clapham.
Giles, George John.....London.
Machin, Frederick John.....Sheffield.
†Marshall, Charles.....Harrogate.
Trist, Richard.....Plymouth.
Wilford, Josiah.....Newport Pagnell.

REGISTERED APPRENTICES AND STUDENTS.

Name.	Residing with	Address
Barnes, Joshua Elijah	Mr. Hill	London.
Garner, Frederick Henry	Mr. Herington	Leighton Buzzard.
Harrison, William	Mr. Stanton	Wisbeach.
Harsant, William Henry	Mr. Harsant	Epsom.
Jones, William Nathanael	Mr. Roberts	Conway.
New, Thomas Cheney	Mr. New	Evesham.
Pitts, Alfred Julian	Mr. Pitts	Hingham.
Pretty, Charles	Mr. Smith	Birmingham.
Richardson, Thomas W.	Mr. Sutton	Norwich.
Wakefield, John	Mr. Wakefield	Teddington.

BOARD OF EXAMINERS, *June 24th*, 1868.

Present—Messrs. Carteighe, Davenport, Deane, Evans, Gale, Garle, Haselden, and Squire.

Seven Candidates presented themselves; the following four passed and were duly registered as Pharmaceutical Chemists:—

Bell, James Alfred.....Brighton.
Claypole, Alfred Hughes.....York Town.
Crow, Edwin Lewis.....Lewisham.
Walker, Charles.....London.

PROVINCIAL TRANSACTIONS.

LIVERPOOL CHEMISTS' ASSOCIATION.

Fifteenth and concluding Meeting of the Session, held at the Royal Institution, May 21st, 1868; the President, Mr. R. Sumner, in the chair.

Donations to the Library of the 'Chemist and Druggist' and 'New York Druggists' Circular' were announced and duly acknowledged.

* Passed in honours; eligible, at the end of the Session, to compete for the Pereira Medal.
† Passed in honours; eligible, at the end of the Session, to compete for the Prize of Books.

The SECRETARY mentioned the advantage which he had found in using tincture of turmeric instead of litmus in testing vinegar. By using this, the indication of neutralization in a coloured solution was sharper and more satisfactory, and some results of analyses were cited. The process is one which has been recently published.

Several other miscellaneous communications were made, after which the PRESIDENT delivered his Valedictory. Address :—

We have now arrived at the close of another Session, bearing with it its events to mark its benefits or otherwise in coming time to those who have shared with us in its working, or neglected the advantages which it has afforded. Our design and avowed purpose at the outset were self-improvement and the public good; how far these have been accomplished may not be so self-evident even to those who have been the most benefited. There is, however, in the foreground of this Session one feature peculiar to itself, which deserves our first notice, I mean the course of lectures which your Honorary Secretary has delivered on the evenings of our regular meetings. I may congratulate all you who have attended them, and on your part and my own express our thorough appreciation, and tender our warmest thanks to Mr. Davies for the labour he has bestowed and the ability he has brought to bear upon his subjects. I am fully persuaded that if their advantages were more known, they would have been more numerously attended; but as only about one-half of his course is exhausted, and he has signified his determination to complete his engagement with your Committee in what remains of the course, I may express my sanguine hope that next Session will witness a very full attendance.

It is gratifying, too, that the subjects which have been brought before us at our meetings have been mainly, if not entirely, contributed by members of our own Association; and although, it must be confessed, we have drawn heavily upon a few of our members, when we remember the ability and the inexhaustible resources from which so much has come, we feel that we have still a storehouse that will not fail us in the future.

I could have wished that some of these papers had been more fully reported, particularly those which dealt so fully, yet so fairly, with the puffing mania of the present time.

A proprietary article no sooner makes its appearance in print than we have half a score originals for its father. What an unseemly contest for parentage! Would that some of it could be turned into other channels, and transferred to those hapless but innumerable instances which lead to the degrading infanticide of the present time, and which have become, not only a reproach to a Christian community, but reduce the human infinitely below the brute creation. An evil this which will never be remedied until the law steps close and sharp upon the heels of the father, to compel an unwilling parentage, and a greater burden of support both of mother and child.

To see a scientific publication become more and more a medium of puffing before the world, contentious for "the original" and "only genuine,"—the praise of one's own, and by name disparaging others,—is a matter to be deplored, but by no means so easy to control, for a censorship is all but impossible; nor, perhaps, should we expect to see the remuneration derived from such advertisements disregarded.

There is need, however, for making the 'Pharmaceutical Journal' more specially scientific. The Society established itself as an educational body, and to it we must look to lead, and to publish the increasing development of chemical and pharmaceutical science.

In this we are encouraged at present by the medical profession, who, from whatever cause, seem disposed, if not determined, to leave the pharmaceutical chemist full field for this work. How far this is a disadvantage, both to the medical profession and suffering humanity, time and its results will show. It is, however, a prevailing impression that medical students of the present day do not work themselves into a practical knowledge of chemistry to the same extent as in bygone time. Why it should not form a most prominent place in their studies is hard to understand, when a want of such knowledge may lead sometimes to prescribing that which will neutralize the very thing they wish to accomplish?

An artist who knows nothing chemically of his colours may produce that which shall outlive Vandyke, but where the chemist and the artist are centred in the same man, he will be able to affirm with more certainty what his work shall be when he is not.

I am aware these are compounds difficult to find in the same person, and frequently

the scientific absorbs and sometimes extinguishes the business qualities of the man ; so, by the same rule, as in our own body, the business claims on our time leave but little time for, and lead to little of the scientific.

The qualification both of the medical profession and ours should be made, not only compulsory, but as complete as possible ; and this can never be so favourably done as in the first full burst of life.

The annual gathering of the Pharmaceutical Conference at the same time and place as the British Association, must have a salutary tendency to elevate chemistry, and especially pharmaceutical chemistry, but the greater impetus will ever be wanting until we get centralized authority, established by Act of Parliament, constituting the Pharmaceutical Society the governing body of the dispensers of and dealers in medicines over the United Kingdom. This surely we may hope for at no distant date ; but so far as the House of Commons is concerned, the commotion of the present state of parties, the little that has been done, and the less that is now likely to be done, leaves no hope of legislation for us this Session.

Are we then to look for a second philanthropist to go into Parliament for the avowed purpose of carrying a Bill which is more for the public benefit than for the body to which we belong? For my part, I cannot see why the Government of the day, of whatever party in politics it may be, should not take up such a matter as this, and pass a Bill to which there now seems no reasonable opposition could be raised. As a means to this end, our whole efforts should be put forth, by making it a prominent request to the various Members of Parliament, bearing in mind the old adage, "Many hands make light work," and thereby show both our strength and unanimity ; and when could we have a more favourable opportunity for this than the coming elections?

In speaking of the meetings of the British Association and the Pharmaceutical Conference, we do look forward with the hope that at no distant period we may be honoured in Liverpool with visits of both those bodies ; and I think it becomes us to note the beneficial influence they have left behind them in places where they have been, especially the impetus which the Conference seems to have given to the chemists in the various towns visited.

We have for years compared favourably with other towns as regards our Association ; it would be well, therefore, for us to anticipate these visits, not only by our present organization, but by rendering it as efficient as possible. I do hope, therefore, we shall make our next Session a march in advance upon those of the past, so that if they do come and when they do come, we may be able to give them a reception worthy of them and of ourselves.

As respects the British Association, it is so many years since they visited Liverpool, that the learned societies of the town waited upon the mayor of last year, the result of which interview was, that an invitation was sent to that body in the name of the mayor and corporation, and I believe also the learned societies of Liverpool, but as Liverpool is by no means first nor second on the list of invitations, it will be found necessary and desirable to repeat it again this year, which I hope will be done.

I feel pleased to see that the subject of our last meeting—the Metric System of Weights and Measures—has been brought before the House of Commons, and that it secured so large a majority on its second reading ; and although it is not likely to make further progress this Session, this does serve to raise our hopes that we shall conform to Continental countries in this matter at no distant time. Liverpool is, at present, the only town, I believe, where the corn-market is ruled by the cental ; but what a simplifying of that trade would result from its general adoption? Take the 'Mark Lane Express,' and a collection of country newspapers, and what can you make of the quotations?—a great chaos! Wheat, barley, oats, and beans, each sold under as many definitions, probably in one market ; and even if the bushel could be made national, scarcely any two towns would agree as to measure and weight of the same grain. If, therefore, one universal standard can be established, what convenience, what advantage, what satisfaction will be established in the dealings of nation with nation! The time has arrived when every barrier must be removed that tends to isolation. The whole world is bound together by the iron cord of electricity, iron roads, and steam navigation. I would not contend for identity in name any more than for oneness of language, but as the sun and the moon are the same and alike to other nations and to us, although defined by each in its own way, so may we have one standard in weight, one standard

in measure for a given quantity, and let each call that same quantity in its own way; and if even Brother Jonathan, who more generally speaks our language than any other, is determined not to call a box a box, let him use any other word that pleases him better, and we will understand him. America and England coming into the Continental metric system, would make its use nearly universal in the commercial world.

With regard to the time in which this change should become law, I cannot see the need for long delay, any more than in other enactments which are passed and at once become law. In a change of weights and measures, you have only to establish the standard, and commercially the price will regulate itself. The general community, and especially the poorer classes, will have their difficulties done for them, and the educated will find it infinitely easier than the juvenile competitive examination for the civil service at present established. I do therefore hope the favourable progress this subject has made on its second reading will be so much gained towards its final accomplishment.

Mr. Shaw moved a vote of thanks to the President for his able address, and passed a high encomium on the efficient and constant manner in which he had filled the President's chair during the Session.

Mr. Redford seconded the motion, which was carried unanimously by acclamation.

ORIGINAL AND EXTRACTED ARTICLES.

ON RECENT CHANGES IN CHEMICAL NOTATION AND ATOMIC WEIGHTS.

BY WILLIAM A. TILDEN, F.C.S., DEMONSTRATOR IN THE LABORATORY OF THE PHARMACEUTICAL SOCIETY.

(*Concluded from Vol. IX. page* 583.)

We are indebted mainly to Gerhardt for the theory of types. In four substances which he selected, viz. hydrogen, hydrochloric acid, water, and ammonia, he saw models or 'types' of structure upon which he conceived the formulæ of all other bodies should be moulded. The analogy really extends beyond the formulæ to the properties of the bodies. Had it been otherwise, the idea would have fallen to the ground. It has, however, been extended and modified, and the principle upon which it is founded furnishes the basis of modern rational formulæ. My purpose is not to show the objections which have been urged against the type formulæ and the manner in which they have been met, but simply to explain the notation now in use among a large number of eminent chemists.

This purpose will best be served by writing the rational formulæ of one or two compounds of importance, and giving the reasons which have led to this particular mode of expression.

There are two kinds, it may be said, of rational formulæ commonly employed.

Referring to acids, for example, we are usually satisfied with denoting them by such formulæ as to keep prominent the characteristic property of compounds of that class, viz. that of exchanging one or more atoms of hydrogen for an equivalent quantity of a metal, by the ordinary way of double decomposition.

	Formula.	
	Old.	New.
Hydrochloric Acid	HCl	HCl
Nitric Acid	HO, NO_5 . . .	HNO_3
Acetic Acid	$HO, C_4H_3O_3$.	$HC_2H_3O_2$
Sulphuric Acid	HO, SO_3 . . .	H_2SO_4
Tartaric Acid	$2HO, C_8H_4O_{10}$.	$H_2C_4H_4O_6$
Phosphoric Acid	$3HO, PO_5$ . . .	H_3PO_4

The formulæ in the last column evidently remind us of one circumstance only; namely, that the hydrogen written first is replaceable by metals to the extent of one, two, or three atoms; those containing one replaceable atom being denominated monobasic, those with two, dibasic, and those with three, tribasic acids. Similarly with saline compounds, the ordinary formula tells us only the proportion of metal in the molecule.

	Formula.	
	Old.	New.
Nitrate of Potassium	KO,NO_5 . .	KNO_3
Carbonate of Potassium . . .	KO,CO_2 . .	K_2CO_3
Acid Carbonate of Potassium .	$KO,HO,2CO_2$	$KHCO_3$
Ordinary Phosphate of Sodium .	$2NaO,HO,PO_5$	Na_2HPO_4
Sulphate of Copper	CuO,SO_3 . .	$CuSO_4$
Mercuric Nitrate	$HgO_2,2NO_5$.	$Hg2NO_3$
Ferrous Sulphate	FeO,SO_3 . .	$FeSO_4$
Ferric Sulphate	$Fe_2O_3,3SO_3$.	Fe_23SO_4
etc.	etc.	etc.

But, referring still to the acids as example, there are other changes of which they are capable, and which it is sometimes necessary to indicate in the building up of their formulæ.

In representing sulphuric acid as $\left.\begin{matrix}SO_2\\H_2\end{matrix}\right\}O_2$ $\left(\text{or } SO_2\left\{\begin{matrix}HO\\HO\end{matrix}\right. \text{ or } SO_2 2HO\right)$ we suggest much more than by the simpler expression H_2SO_4. By formulæ such as these, in fact, we recall the principal reactions in which sulphuric acid takes origin, or in which it permits the substitution of one or other of its constituent parts.

Sulphurous Acid Gas. Hydroxyl (Peroxide of Hydrogen). Sulphuric Acid.

$$SO_2 + (HO)_2 = (SO_2)''2HO$$

Sulphurous Acid Gas. Chlorine. Chloride of Sulphuryl.

$$SO_2 + Cl_2 = (SO_2)''Cl_2$$

2 Mols. of Water.

$$(SO_2)''Cl_2 + \left.\begin{matrix}H\\H\\H\\H\end{matrix}\right\}O = \left.\begin{matrix}H\\(SO_2)''\\H\end{matrix}\right\}O + \left.\begin{matrix}H\\H\end{matrix}\right\}Cl_2$$

Sulphuric Acid. Hydrochloric Acid.

$$= \left.\begin{matrix}(SO_2)''\\H_2\end{matrix}\right\}O_2 + 2HCl$$

Here it appears that the chlorine of the chloride of sulphuryl seizes on an atom of hydrogen from each molecule of water, whilst the SO_2 retaining its bivalent character locks the two residues together, as it had previously done the two atoms of chlorine. The formula of the chloride is thus quite comparable to that of the hydrate.

$$\left(SO_2\right)''\left\{\begin{matrix}Cl\\Cl\end{matrix}\right. \qquad \left(SO_2\right)''\left\{\begin{matrix}HO\\HO\end{matrix}\right.$$

On inspecting these two compounds it becomes immediately evident that there should be one intermediate between them $\left(SO_2\right)''\left\{\begin{matrix}HO\\Cl\end{matrix}\right.$, partaking of the characters of both. This body has in reality been produced.

Whilst rendering manifest possible changes of this kind, these formulæ allow the expression of ordinary decompositions with every convenience. The following examples of the sulphates show how the constitution of salts of the metals is represented on the same plan:—

Acid Sulphate of Potassium	$\left.\begin{matrix}(SO_2)''\\ KH\end{matrix}\right\}O_2$
Sulphate of Sodium and Ammonium .	$\left.\begin{matrix}(SO_2'')\\ (NH_4)Na\end{matrix}\right\}O_2$
Sulphate of Zinc	$\left.\begin{matrix}(SO_2)''\\ Zn''\end{matrix}\right\}O_2$
Ferrous Sulphate	$\left.\begin{matrix}(SO_2)''\\ Fe''\end{matrix}\right\}O_2$
Ferric Sulphate	$\left.\begin{matrix}(SO_2)''_3\\ (Fe_2)^{vi}\end{matrix}\right\}O_6$
Turpith Mineral	$\left.\begin{matrix}Hg''_3\\ (SO_2)''\end{matrix}\right\}O_4$

All these are said to be type formulæ, since they preserve a resemblance to that of the type $\left.\begin{matrix}H\\H\end{matrix}\right\}O$, and serve to recall the analogy existing between the reactions of that body and the compounds thus represented.

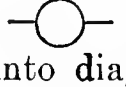
Some chemists go further than this, and regard a chemical formula as a sort of chart, which is supposed to be capable of showing the directions of the imaginary "links" or "bonds" which hold the parts of the molecule together. "It is no longer a question of classifying reactions; the question is to determine the intimate structure of the molecule, by establishing the manner in which the atoms are bound together. Our rational formulæ, then, do not now represent types of double decomposition; they have for their object to indicate the bonds which exist between the various atoms constituting a molecule."

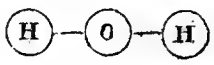
Water, to take an instance, is represented by a formula similar to that already employed, but possessing a different significance. By the expression $O\left\{\begin{matrix}H\\H\end{matrix}\right.$ it is not now intended solely to indicate that the two atoms of hydrogen are separately capable of replacement, but to show that one atom is connected with one of the two bonds which the oxygen has at its disposal, the second of which serving for the attachment of the remaining atom of hydrogen.

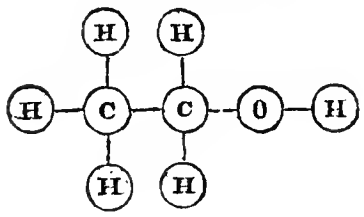
Again, methylic alcohol would now be written upon the same principles,

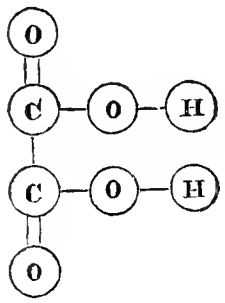
$$O\left\{\begin{matrix}CH_3\\H\end{matrix}\right. \qquad \text{or} \qquad C\left\{\begin{matrix}H_3\\OH\end{matrix}\right.$$

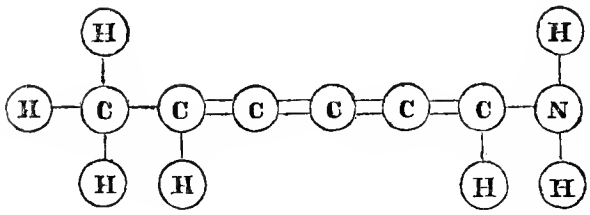
either of which formulæ expresses the same idea. That is to say, the first implies that the lower atom of hydrogen is connected with the group above by the mediation of the atom of oxygen which brackets them together: in both, three out of the four bonds possessed by the carbon are satisfied by H_3, the remaining bond connecting this C with the oxygen, which, in its turn, dispose of half its affinity in favour of the carbon, and half to the hydrogen adjacent to itself. The promulgators of these views have invented a system of graphic notation, by which they endeavour to give greater precision to their symbolic language. This graphic notation has assumed various forms; that most commonly adopted in this country consists in the employment of circles to denote the various atoms, having attached to them arms corresponding in number with the units of affinity manifested by the element.

Monatomic elements are known thus ◯— ; diatomic elements, —◯— ; triatomic elements,  ; etc., according to the atomicity, and these are combined together into diagrams in the manner shown in the following formulæ, which express the constitution of:—

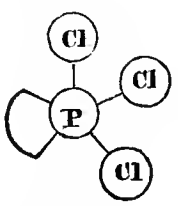
Water—  $O\left\{\begin{matrix}H\\H\end{matrix}\right.$

Ethylic Alcohol—  $O\left\{\begin{matrix}C_2H_5\\H\end{matrix}\right.$

Oxalic Acid—  $O_2\left\{\begin{matrix}C_2O_2\\H_2\end{matrix}\right.$

and Aniline—  $N\left\{\begin{matrix}C_6H_5\\H\\H\end{matrix}\right.$

I may be allowed to say that, as it appears to me, this system is open to very important objections. In the first place it has been very properly maintained that the mind has naturally more than sufficient tendency to materialize in surveying questions connected with the manifestation of chemical force without being propelled in the same direction by the constant employment of pictorial formulæ. The lines connecting the atoms in such formulæ, we have reason to believe, have no more real existence in nature than the epicycles and deferents of ancient astronomy. Of course this is plainly set down by those who employ graphic notation, but I conceive a system requiring perpetual protestation to be little adapted for the purposes of teaching. What advantage can it have, then, since constitution can be as well expressed by letters alone? The system, too, has some difficulties in application. Polyatomic elements, it is well known, do not exhibit invariably the same atomicity; when, for example, phosphorus is combined with five atoms of Cl it is quite saturated; but it also combines with Cl_3; what, in that case, becomes of the two units of combining power which are not exercised? It has been thought necessary to invent the following account of them, that the two 'bonds' become latent by uniting with and saturating each other!



This extraordinary idea was not hit upon till graphic formulæ came in vogue.

Little need be suggested as to the inconvenience occasioned by the trouble of writing these diagrams, and the space they occupy; but it might be pointed out that enthusiasm, no doubt, in the cause has led to the represen-

tation of many chemical compounds by constitutional formulæ for which, at present, there is no experimental foundation whatever; such excess cannot fail to be prejudicial to the advancement of real science.

Another topic demands a few words. Chemical compounds differ in the tenacity with which their constituents are held together. Considerations connected with this have led chemists to receive the notion of two kinds of chemical combination, namely, combination between atoms, the ordinary mode, and combination between molecules as such. To the latter division are referred chiefly salts which contain water of crystallization. In $FeSO_4$, $7H_2O$, for example, $FeSO_4$ is presumed to form one complete molecule, round which are attached the seven molecules of H_2O by a kind of adhesion. Every probability attaches to this hypothesis; the only objection it presents is that of being somewhat premature. There exists a great number of compounds, which, with our present knowledge, can only be referred with hesitation to either class. The metallic hydrates furnish an example. There can be no doubt that caustic potash should be expressed as KHO, and also slaked lime Ca2HO, but whether ferric hydrate should be $Fe_2$6HO or Fe_2O_3, $3H_2O$, it seems difficult to decide. Analogy points to the former; the properties of the body to the latter formula. Ferric hydrate, as is well known, even though never removed from contact with water, from the moment of its formation, and without apparent cause, changes in composition by parting with the elements of water. Similar phenomena are observable with hydrate of copper and other metals. Again, are the so-called salts of urea atomic, or molecular compounds? They continually change in composition by mere recrystallization. Many other instances might be cited.

Notwithstanding the advance which has been made of late years, an advance which is undoubted, the number of great and difficult problems which yet remain to be solved is such as should remind us of the necessity that still remains, "to prove all things, and hold fast (only) to that which is good."

ON BLACK WAX.*

BY WALTER G. SMITH, M.B. T.C.D.,

ASSISTANT-PHYSICIAN TO THE ADELAIDE HOSPITAL.

When we meet with a number of products that are derived from the animal and vegetable kingdoms, and which exhibit certain characters indicating analogous properties, it becomes a matter of interest to investigate the nature of the constituents which enter into their composition. The subject of animal secretions is one of singular interest, especially when we compare varieties in the constitution of analogous secretions from different animals and under varying conditions of climate (Brodie). My remarks on this occasion will be confined to the illustration of a specimen of black wax which I subjected to analysis.

In May, 1867, my father, while in London, purchased from Messrs. Hearon and Co. a portion of a cake of black wax, of which no information could be obtained as to its source, except that it was imported from Madras in the year 1862.

The specimen, which is in the Museum of Materia Medica, Trinity College, Dublin, is evidently a portion of a large cake which was solidified after fusion. Its dimensions are 6 inches by 4, and its weight a little more than $18\frac{1}{2}$ ounces; its thickness varies from an inch and a half to an inch and a quarter. One side is bevelled, and it retains the impression of the straight side of the vessel or,

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* Read at an evening meeting of the Royal Dublin Society, May 4th, 1868.

more probably, earthen mould in which it was solidified. It consists of two distinct layers: the upper, one inch in thickness, of a jet black colour, and its recently-fractured surface somewhat conchoidal; the lower layer, which is only to be distinguished from the upper by its browner colour and more granular fracture, is about half an inch in thickness. The cut surface of both layers exhibits a waxy lustre, and the upper layer is more readily indented by the nail than the lower.

It does not possess any characteristic odour or taste, and when chewed does not adhere to the teeth.

The upper surface is smooth and free from impurities; at one side it presents a vesicular appearance, such as usually occurs near the margin of a vessel in which a waxy composition has solidified; the under surface presents some irregular shallow depressions, which are lined with adherent vegetable fibre, apparently the *débris* of an endogenous plant.

The specific gravity of the thick upper layer is 0·985, a somewhat higher density than that of beeswax, which averages 0·96; and the specific gravity of the thinner brown layer is 1·462. The greater density of this stratum is chiefly owing to the presence of a considerable amount of sand. The fusing-point of the black portion is about 148° F., or nearly the same as that of ordinary wax. Very little can be said as to its natural history, but its close resemblance in physical properties to common wax, and Pomet's account of it, which I shall presently quote, would warrant us in concluding that it owes its origin to a particular species of bee.

No mention is made of a similar substance in any of the numerous modern works consulted, including Hagen's 'Bibliotheca Entomologica,' for reference to which I am indebted to Dr. Perceval Wright.

In one of the earlier volumes of the 'Pharmaceutical Journal' (vol. xii. 1853, p. 401, quoted from the Reports of Juries), there is an allusion to a curious wax which had been imported from Brazil, the product of a black bee which hives under ground. It was soft and exceedingly tenacious, and of a dark mahogany colour.

In Pomet's 'Histoire des Drogues,' published in 1735, there is a short article on the black wax of India, which directly bears upon the present subject:—

"*De la Cire noire des Indes.*—En plusieurs endroits des Indes, tant orientales qu'occidentales, il s'y trouve de petites abeilles qui font leurs ruches dans le creux de certaines arbres. Ces abeilles font leur miel dans de petits vaisseaux de cire noire, qui sont de la grosseur et figure des œufs de pigeons; ce miel est très-agréable et d'une couleur d'ambre. Les Indiens se servent de cette cire pour faire des cierges et pour recueillir de l'arbre le baume surnommé de tolu, ainsi que je l'ai marqué ci-devant.

"Quelques auteurs disent, qu'il y a un animal qui est semblable à un chat qui est noir, que les Indiens appellent *heirat*, ou *bête à miel*, qui le plus souvent monte dessus ces arbres et mange tout le miel, et ce qui est plus surprenant, c'est que cet animal tire les rayons du miel avec sa patte, et ne fait aucun mal aux mouches, et les mouches ne lui en font point non plus, parce qu'elles n'ont point d'éguillon commes les nôtres. Cette cire étoit autrefois fort en usage en Espagne et quelque peu en France, mais à present on ne sçait plus ce que c'est, étant une des plus rares drogues que nous ayons." (In-fol. p. 56, ii. partie.) Pomet's Hist. Gén. des Drogues, nouv. édit. 1735, liv. iii. p. 168.

I shall now give the details of the chemical examination which I made with the assistance of Dr. Emerson Reynolds.

3·009 grammes were exhausted with boiling rectified spirit, filtered, and washed.

The dark brown residue left undissolved by the alcohol was treated frequently with ether, which partially dissolved it, and filtered.

On spontaneous evaporation of the ether, a brown colouring-matter remained. This colouring-matter was easily soluble in bisulphide of carbon, in benzol, and in chloroform, and when heated with hydrate of potash turned black, and evolved ammonia.

It fused very readily, and did not appear to be acted upon by a strong alcoholic solution of caustic potash.

The black substance insoluble in ether was digested with chloroform, which immediately formed with it an opaque treacly fluid.

Nothing appreciable was taken up from it by benzol, but it was quickly and entirely soluble in bisulphide of carbon, and likewise evolved ammonia when heated with caustic alkali.

The first alcoholic filtrate was concentrated to a small bulk and let cool, to allow the cerotic acid to deposit.

The precipitate was then filtered off.

The cold alcoholic solution was evaporated to dryness, and the residual cerolein weighed. The cerotic acid was got by difference.

The results of the analysis are as follows :—

Black Wax.			*Beeswax.* Average Composition.	
Colouring matter, insoluble in ether	0·5142	17·088		
Colouring matter, soluble in ether	0·1280	4·253	Myricin . . .	73
Cerolein	0·4530	15·054	Cerolein . . .	5
Crude cerotic acid . . .	1·9138	63·602	Cerotic acid . .	22
	3·009	99·997		100

The identity of the cerolein with that obtained from beeswax is shown by its being acid to litmus, fusible at a very low temperature, soluble in ether, and quickly saponified by a hot alcoholic solution of potash.

The quantity of cerotic acid obtained was too small, even had it been carefully purified, to admit of the determination of its atomic weight from the silver salt; but the derivation of it from a wax, its solubility in boiling alcohol, and the character of the precipitates which it gave with alcoholic solutions of acetate of lead and of nitrate of silver, all point to its identity with the cerotic acid of Brodie.

This cerotic acid appears to exist in the wax in an uncombined state,—a fact to which Sir B. Brodie drew attention, as being without a parallel among any of the true fats.

It may be remarked, that the separation of the cerotic acid from the other constituents is a particularly tedious process, and involves considerable delay.

I have placed the average percentage composition of beeswax beside my own analysis, for the purpose of comparison.

It will be seen that the percentage amounts of cerolein and cerotic acid are each about three times as great as in beeswax; but it should be borne in mind that the proportion of cerotic acid varies in different samples of wax, and that it was entirely wanting in a specimen of Ceylon wax, and in a wax made by wild bees in Surrey (Brodie).

The place of the myricin, *i. e.* the portion insoluble in alcohol, and which constitutes nearly three-fourths of the weight of common wax, is represented in the black wax by the two brown colouring-matters.

It is to be regretted that, from the limited quantity of the wax operated on, I was unable to extract a sufficient amount of either colouring-matter for the purpose of submitting it to ultimate analysis.

A combustion of the wax as a whole would also be desirable, were it only to confirm the statement that, in nearly all the varieties of wax, as well as in the products derived from this body, the carbon and hydrogen are in equal atomic proportions.

THE ROYAL MICROSCOPICAL SOCIETY.

BY JOSEPH INCE.

"Minimis partibus, per totum Naturæ campum, certitudo omnis innititur; quas qui fugit pariter Naturam fugit."—*Linnæus.*

"Videns, sciens."

"Magna minima Dei."

About thirty years ago certain lovers of the Microscope used to meet at each other's houses for the purpose of testing the accuracy of their several observations, comparing different instruments and of otherwise promoting the science in which they were engaged. The great inconvenience however of no fixed place of residence and inadequate accommodation led to the determination to establish a regularly constituted Society having a definite abode; hence a meeting was held at the house of Edwin J. Quekett, Wellclose Square, Sept. 3, 1839, "to take into consideration the propriety of forming a Society for the promotion of Microscopical investigation, and for the introduction and improvement of the microscope as a scientific instrument."

The general plan of the constitution and government of the Society having been drawn up, a public meeting was held at the Horticultural Society's Rooms 21 Regent Street, on Friday the 20th December, 1839, when the establishment of the Microscopical Society was finally determined. Professor Owen took the chair, Mr. N. B. Ward * was elected Treasurer, and Dr. Arthur Farre became Secretary. The terms of admission were an entrance fee of one guinea, and a yearly subscription of the same sum paid in advance. At the first Annual Meeting held in 1841 there were 177 members, a number which fully justified the creation of the Association, and there were 18 papers read, one of which consisted of the laborious and masterly researches "On the structure of fossil Sponges" by J. S. Bowerbank; a second "On the Development of the Vascular Tissue in Plants" by E. J. Quekett, and a third "On the vascular structure of the allantois and Vitelline Membrane of the incubated Egg" by John Dalrymple; these may be mentioned as showing the character and importance of the earlier communications; a library and a collection of microscopic objects were commenced, while the funds at the disposal of the Council procured a stand which had to wait in patience for its destined instrument. Not long however, for in the next President's address he had to congratulate members on the purchase of one from Mr. Powell, another from Mr. Ross and a third from Mr. Smith. The immediate use of this apparatus was to place it at the disposal of Committees appointed by the Council to conduct particular branches of enquiry, following out the advice of Professor Lindley: "In the application of the powers and advantages of an association of observers to gain an intimacy

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* Nathaniel Bagshaw Ward, the inventor of Wardian Cases, by which many most interesting exotic plants have been introduced into this country, and which have enabled so many to cultivate ferns in their rooms with delight and instruction, died at the age of seventy-seven, at St. Leonards, on the 4th June, 1868. He was a botanist of considerable reputation, Fellow of the Royal Society, and other scientific Societies; lately Master of the Apothecaries' Company, one of the examiners, and took considerable interest in the education and examination of females for the medical profession. His house in Wellclose Square, and afterwards at Clapham Rise, was one of the scientific curiosities of London, showing how many and how well plants might be cultivated in a small space in or near a large city.

with nature, it is more important in regard to the microscope than to any other instrument of philosophical research to conceive clearly the aim of our researches, and to give a right direction to our exertions: otherwise we shall ensure mere amusement, or perhaps only fatigue, instead of success."

Combined, intelligent effort is of infinite value in all research, of which our learned Societies are a proof, being only Committees on a larger scale.

The first Committee named was one for the purpose of investigating the structure of shells both recent and fossil; a sum of £5 was voted for expenses, and the members were Richard Owen, T. Rymer Jones and John Quekett. Here we come upon a mention of the microscope as applied to Chemistry. Mr. Warington investigated the nature of the changes in colour which occur when the scarlet biniodide of Mercury is subjected to the influence of heat and sublimed. The result seemed to show that the yellow crystals formed upon the application of heat, are owing to certain separations of the laminæ of the crystals from each other; and he found that when the scarlet colour had been resumed, the yellow might be again produced by a rapid application of heat.

Little advantage would be derived from crowding these pages with a summary of Papers contributed from time to time by members of the Society to their Journal and Transactions, but many Pharmaceutical readers might be interested in a case of poison detected by means of microscopic analysis by Mr. Henry Deane.

Moreover the facts seem not to have been recorded, but were merely alluded to in a Presidential address.

William Coles, an infant seven months old, died ten minutes after swallowing its physic.

The parents lived at Emborough a small village situated between Bath and Wells, where on the 1st of March, 1865, an inquest was concluded before J. Wybrants Esq. M.D. coroner for the county of Somerset.

In January the mother bought a packet of Steedman's powders from a chemist of the name of Habgood—one was given and produced relief; a month afterwards a second was mixed in some moist sugar, a little nursemaid administered the dose, and in the brief space of time already mentioned the child was dead. The remaining powders were examined, five were untouched, but from the sixth paper the original powder had been removed and about ten grains of corrosive sublimate inserted. The same substance on a post mortem examination was found in the child's mouth, removing all doubt as to the cause of death. The natural suspicion was firstly some dire mistake on the part of the manufacturer, secondly sophistication at the wholesale house, thirdly that the packet had been tampered with while at the Chemist's.

The first idea was shown to be without foundation or poison would have been distributed throughout the country; the second and third impossible as the packet had been delivered whole. Whereupon Mr. Deane was summoned from London as a microscopical analyst.

The so-called Steedman's powder placed under the Microscope turned out to be corrosive sublimate, the crystals soiled and stained in a peculiar manner containing particles of hair or wool and other fibrous matters all much rubbed. The corrosive sublimate examined presented the same characteristics. Sublimate is not soiled when coming from a Druggist's shop, usually it is carefully wrapped up, sealed and labelled. Chemists are exceedingly careful in its sale. "I do not think" (it was continued in evidence) "there was any difference in the quality of the two powders. I am satisfied as to the identity of the dirt. I have had much experience in microscopic science during twenty-three years' practice both on my own account and that of professional men.

"It requires considerable practice in the study to avoid fallacies. The particles of wool seemed to be broken up and ragged at the ends in both packets. There was no essential difference between the two."

Now Mr. Coles, the father kept corrosive sublimate in lump for the purpose of touching sores of sheep—this lump was in an unlocked drawer, and his shepherd had a piece which he unfortunately lost.

Who gave the poison, the parents, the shepherd, the nursemaid or some enemy unknown? The Government offered a reward of £100 in vain, and the last day only will reveal the secret which the microscope could not discover—there is a limit to its power.

Under the stimulating influence of the Society the construction of the instrument itself was rapidly improved. Dr. Goring in the Exordium to the first edition of Microscopic Illustrations published in 1829 gave his opinion that the Microscope had reached the standard of perfection, but in January 1830 Mr. Joseph Lister F.R.S. published his paper "On the Improvements of Achromatic Compound Microscopes," and on the principles there enunciated the new and better instruments were constructed. The first of the modern achromatic combinations made in England were the triplets constructed by the late Wm. Tulley in 1824, and the first stand with double actions to the stage was made by Mr. Smith in 1823—so slowly were these appreciated that ten years later only five had been manufactured—ten years after that date 724 had been produced besides adaptations of modern achromatic combinations to old instruments.

In the address delivered by Bowerbank (1847) from which these statements are taken, he was able to tell the members that during his Presidential year the makers had disposed of 99 microscopes—these found their way into various parts of the world, were sent specially to India and America, while by far the greater number were received as welcome guests by the members of the medical Profession. Strange work these microscopes occasionally had to accomplish as we may gather from the paper read by Mr. J. Quekett (1849) "On the value of the microscope in the Determination of Minute Animal Structures of a Doubtful Nature." The author after alluding to the value of the instrument in different ways in zoological classification and especially in the study of the various forms of hair, details his observations upon portions of skin taken from the doors of Worcester Cathedral and other churches in different parts of the kingdom. Tradition declared these to be human, but direct evidence was wanting. The Archæological Society called in the aid of Mr. Quekett's object-glass, who on examining a piece of skin containing only two hairs was able to determine the human character of the fragment.

Shortly afterwards Mr. Way sent another portion of skin said to be that of a Danish pirate taken from the door of the church of Hadstock, in Essex: on this portion were many hairs also undoubtedly human. The same result followed the examination of a third portion of skin from the church door of Copford, also in Essex. Report affirmed that these portions of skin belonged to certain sacrilegious malefactors, pirates and others, whose flayed skins were nailed to cathedral and church doors like weasels on a barn door. Specimens of these remains were exhibited to the Society, and in some instances the colour of the hair was unchanged, time had produced no alteration.

This year Mr. Quekett forwarded his paper "On the Minute Structure of Cartilage in the four great classes of animals;" about this time also disturbances abroad caused an unexpected revolution in the manufacture of glass for optical purposes; for although English opticians held their own in the construction of object-glasses of the highest powers, yet they were compelled to go abroad for the material in which they worked. The glass of which our lenses were for the most part made came either from Switzerland or France: necessity transferred its production to ourselves and Messrs. Chance of Birmingham were able successfully to compete with their foreign neighbours.

Among the Art treasures of the Society the fine old specimen called the Martin Microscope must not be overlooked. It was purchased at the sale of the

late Professor Quekett and was made by the once celebrated Benjamin Martin for his Majesty King George III. It is interesting not only in an antiquarian point of view but as a standard of comparison with regard to modern improvement.

Benjamin Martin was born in the year 1704—a very popular writer on the science of his day, and seems to have combined the functions of a schoolmaster with the sale and manufacture of philosophical apparatus. In his "New and Compendious System of Optics, printed for James Hodges, at the Looking Glass, on London Bridge" the following advertisement occurs. "New invented pocket reflecting Microscopes with Micrometers, made and sold by Benjamin Martin, in Chichester, at the following prices, viz., those with a micrometer at one guinea; without a micrometer at ten shillings and sixpence," and concludes by stating "that they may be obtained on application at the British Coffee House, Finch Lane, London, or sent to any part of England by a letter to me at Chichester. Allowance will be made to those who take a quantity." An excellent account both of this microscope and the maker is given by Mr. John Williams in the Quarterly Journal of the Society April 1862. With respect to its capabilities as an instrument, the higher powers viz. the 15th, 20th, and 30th, line ordinary tests but will not touch the more delicate and would be useless in the examination of diatomaceæ. These three powers gave the following results, the test employed being the scale of Morpho Menelaus tried by candlelight.

The 15th. Indistinct traces of lines very ill defined.

The 20th. Lined distinctly, but the definition anything but sharp.

The 30th. Lined distinctly, but still without good definition; the amplification in all these cases being far beyond that which is necessary for bringing out the lines sharply with the present object-glasses of much lower power. The very finely lined scales of the lepisma were tried with the 30th; very faint traces amounting to a mere suspicion of lines was all it would exhibit: possibly superior modes of illumination might produce better effects with these glasses. The low powers however, define objects suited to them very fairly. (Williams.)

By purchase at the sale of the library of the late Professor Quekett, added to contributions received from time to time the Society was able to report that they had in possession nearly all the works on the Microscope published from 1663 to 1862. A new era was at hand—wisely ambitious they turned their attention to a Royal Charter of Incorporation. Hitherto the Society possessed no legal existence, but now having acquired property in the shape of a large and increasing library, a collection of Microscopes and Microscopic objects, together with money invested in Government security, it appeared good to the Council "that it would be the duty of the Society, as well as an act of prudence to present a petition to the Crown humbly praying that her Majesty would be graciously pleased to grant a Royal Charter for incorporating into a Society the several persons who have already become members." The advantages of this step were obvious—an Association resting under the shadow of legal sanction has powers and influence which it could not otherwise possess, together with a capability of conferring benefit on itself and others higher than that afforded by the best amateur arrangement that could be devised.

Preliminary difficulties were overcome and details of organization were successfully arranged, and in 1866–1867 the President, James Glaisher, F.R.S., was able to announce that the charter was granted on the 28th August, 1866, and that henceforth the members might write F.R.M.S. after their names. It need scarcely be stated that the condition of the Society was in a prosperous state, the numbers were augmented, and the meetings were well attended.

Yet in the midst of the general rejoicing the death of Richard Beck was an unfeigned cause of sorrow. The name of this gentleman is so associated with

microscopic work and workmanship that he must not pass unnoticed. His father was partner in the firm of Lister and Beck, wine merchants. Richard was sent to school where he did not flourish, books not being the groove in which his talents ran. Mechanics were his early literature, and his parents most judiciously allowed him to have his bent; hence Richard Beck did not add one more to the overburdened catalogue of talent wasted because twisted out of its natural direction.

At this time (1841) the manufacture of the microscope seemed a desirable commercial undertaking, accordingly arrangements were made that Richard should learn the business for three years under James Smith, "an excellent workman engaged in carrying out the views of Mr. Joseph Lister and other distinguished members of this Society." His forerunners in the field were Mr. Pritchard, Mr. Powell, and Mr. Ross, the names of the two latter having become household words: still there was ample room both in a commercial and scientific sense, and ultimately through the skill and exertions of Richard Beck, the firm of Smith and Beck obtained an honourable position and took its full share in maintaining the celebrity of English manufacture as well as in aiding in the attainment of that perfection of the instrument which has been such a constant source of admiration. To Beck are owing many important improvements in the mechanical stage and in methods of illumination, and prompt realization of Wenham's arrangement for binocular vision—and not only was he most happy in devising apparatus for special investigations but he was himself a careful and accurate observer. Students unable to purchase the more expensive forms of instrument will be grateful to him for his "Educational Microscope," the "Universal Microscope," and the "Popular Microscope," while his treatise on "Construction, Proper Use, and Capabilities of the Microscope," may be consulted with great advantage. The frontispiece represents the Podura scale as seen with powers from 80 to 1300, presenting those appearances which are accepted as tests of the true correction of objectives and methods of illumination. Beck died at the early age of thirty-nine. The Society has shared with the world of Science the loss of Faraday. Robert Warington must also be numbered among late illustrious Fellows.

I must hasten now to the present standing of the Society—for some years the state of the Cabinet, that is the collection of Microscopic slides was a stock subject of condolence in a President's address—indeed on one occasion it was recommended either to take energetic measures to make it worthy of the original design or to let it be abandoned. The tide turned at last: Professor Smith of Kenyon College, U.S., presented 146 slides of Diatomaceæ, 86 other slides were also given. Dr. G. C. Wallich, F.L.S., with a liberality beyond praise contributed his first instalment of 1031 slides. "Lest any misgiving (wrote the Doctor to the Treasurer) may exist or arise on the subject, I think it as well to put on record, in order that you may make whatever use you like of the information, that I submit the offer of my collection, drawings, etc., to the Society hampered by no condition or reservation whatever." The whole of these slides will be classified, annotated and explained by the donor. This good example has been followed by Joseph Beck who has presented a cabinet containing 426 beautiful sections of Teeth. The cabinet of objects now contains 2674 specimens; they are being entirely re-arranged, placed horizontally instead of vertically as heretofore; a new classification is about to be adopted which will necessitate the compilation of a fresh catalogue.

Pains have been taken not to encumber this account with abstracts of scientific papers—these demand great care and thought and must be studied *in extenso*; yet it would be an omission not to notice the remarkable communication of Professor Lionel Beale on Nutrition, controverting opinions expressed by certain writers on Biological subjects concerning so-called "Vital Action Pro-

cesses." Dr. Beale divides the matter contained in living bodies into three classes—germinal matter, formed material and pabulum. The first only he considers alive or possessed of vital properties. The formed material he regards as no longer living, and the pabulum consists of appropriate matter derived from food and capable of being acted upon by the germinal matter and converted into its own substance. The subject deserves the deepest attention. (Glaisher.)

The mode of publication of the Journal and Transactions is in a transitional state. The growing importance of the Society and the increasing demand for records of its Transactions have led the Council to reconsider existing arrangements. It is thought inconsistent with the dignity of a Royal Society that its proceedings should exclusively appear in a periodical over which neither the President nor Officers have control, in consequence of which in October next a new series under totally different management will be commenced. It is in contemplation annually to award one gold or two silver medals for original research, papers of high merit, or new inventions.

Four hundred and fifty-two Fellows constituted the last ascertained numerical strength of the Society—the acting Treasurer for the past two years, Mr. W. H. Ince, F.L.S., reported more than £1000 in consols, and £168 waiting investment, all extra expenses paid and the balance amounting to £230 in excess of liabilities.

That the affairs of the Society, financially and numerically are in so excellent a position is due to the untiring and well directed energy of Mr. William Henry Ince who to my deep regret is only a namesake of my own: both as officer and private member he has devoted himself to the prosperity of the Society and he may be warmly congratulated on his success.*

"The Microscope" (said Dr. Chalmers) "has redeemed the insignificance of the earth, for it tells that in the leaves of every forest, and in the flowers of every garden, and in the waters of every rivulet there are worlds teeming with life and numberless as are the glories of the Firmament."

"The time is past" (said Owen, 1841) "when the utility or the dignity of such pursuits can be affected by a sneer at the littleness of their objects, as they seem little in the eyes of the indifferent and ignorant. The telescope teaches us that our world is but an atom; and none know better than microscopical observers, that every atom is a world."

No man can work with the Microscope in cold blood, not even when engaged in ordinary investigations; but let a diatom ensnare him and he may relinquish hope. For this strange instrument holds the key which unlocks the secrets of external Nature and is hence the common gain of all inquirers after physical truth.

Nor need we wonder at the fascination when we consider what the Microscope with its visual analysis can reveal: by its aid the brisk manufacturer may learn how to increase the profit of his till, while the profoundest philosopher may lose himself in the loftiest speculations; and if with this new eye we may see marvels in the so-called commonest objects, what must be the delight of him who leaving the earth beneath explores the mysteries of the waters under.

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* Annual collections of accounts of the Microscopical Society during the following years:—

	£.	s.	d.
February, 1862, to January 27, 1863, receipts per cash book . . .	403	2	10
February, 1863, to February, 1864 ,, ,, . . .	333	2	5
February, 1864, to January, 1865 ,, ,, . . .	305	18	8
January, 1865, to February 12, 1866 ,, ,, . . .	343	8	4
February, 1866, to February 12, 1867 ,, ,, . . .	511	5	0
February, 1867, to February 11, 1868 ,, ,, . . .	970	17	5

These men, like those who go down to the sea in ships and do business in great waters, see the works of the Lord and his wonders in the deep.

To those of our own calling, laborious Chemists and Druggists, these remarks are most earnestly commended. Already we number amongst us some microscopic workers. Deane* of Clapham, *cui nomen apud nos semper est in honorem*, Brady † of Newcastle, Schacht of Clifton, Stoddart of Bristol, Clift of Lewisham, Tylee of Bath, Martin of Redland, Waddington and many others, not forgetting one who though a dispensing chemist in a cathedral city is not unfavourably known to the Rev. J. B. Reade. Let me try, not without strong hope, to extend the list. King's College, London, is the present home of the Royal Microscopical Society.

Notice. Our Library contains the following works,—

1. Practical Treatise on the Use of the Microscope. John Quekett.
2. The Microscope and its Revelations. Carpenter.
3. How to Work with the Microscope. Lionel Beale.
4. The Microscope in its special Application to Vegetable Anatomy and Physiology. Hermann Schacht (Translation).
5. History of the Microscope. Jabez Hogg.
6. Quarterly Journal of Microscopical Science.
7. Micrographic Dictionary. Griffith and Henfrey.
8. Lectures on Histology. Quekett.

The Library of the Society, at King's College, is open for use, together with the collection of objects, microscopes, etc., on Mondays, Tuesdays, Thursdays, and Fridays, from 11 A.M. to 4 P.M.; on Wednesdays in the evening only, from 6 to 10 P.M.; and on these days Mr. Walter W. Reeves is in attendance as Assistant-Secretary, Librarian, and Curator.

NITROUS OXIDE AS AN ANÆSTHETIC.

As nitrous oxide is now being used largely in this country, it may not be out of place to say a few words for the benefit of those who may be called on to make the gas. As most of the readers of the Journal are aware, this gas has been used largely in America as an anæsthetic, and at the present time the dentists in England are investigating its effects, and probably it will become a favourite agent in the place of chloroform for short operations, such as the extraction of teeth.

It may seem strange to some that nitrous oxide should come so suddenly into

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* Xanthidia and Polythalamia (foraminifera) found in the grey chalk between Folkestone and Dover. (Oct. 15, 1845.)

On the first discovery of Xanthidia in flint so great was the anxiety to obtain specimens that several tons of flints were broken up in order to find them, but Mr. Deane obtained them from the chalk containing no flint nodules. In one piece of a greyish kind of chalk no less than six species were found by treating it with hydrochloric acid. They were accompanied by Polythalamia and the remains of other organized bodies called Rotalia—he proved that the Xanthidia possessed a horny skeleton.

Vibrio Tritici. (Jan. 1863.)

Physical Characters of Magnesia. (Pharm. Journ. Vol. 8, p. 266.)

Papers read at the British Pharm. Conference on Microscopic Analysis Applied to Pharmacy. (Joint author.)

Mr. Deane also worked for and with Pereira, some of the drawings in the last edition of the Materia Medica being made from his proparations.

† Foraminifera (Synopsis) of the Middle and Upper Lias of Somersetshire. Ellipsoidina, a new Genus of Foraminifera, with Notes on Structure and Affinities.

Papers on Microscopic Subjects and drawings passim.

favour, for it was discovered in 1776 by Priestley, and in 1800 Sir H. Davy carefully examined the stimulating effects produced by its inhalation. The results obtained from these experiments gave to it the popular name of "laughing gas."

Dr. Colton, who has been using the gas in America and in Paris, is in England at the present time, and may be considered as having had the largest experience of this agent. He brings with him a register of some 27,000 cases where the gas has been used as a substitute for chloroform.

When the nitrous oxide gas is inhaled through an ordinary chloroform inhaler, the effect is to produce anæsthesia; in other words, if you want to obtain insensibility without excitement, the nitrous oxide must be given unmixed with air. The excitement produced by this gas, which has given it the name of laughing gas, is probably due to admixture of carbonic acid and air exhaled from the lungs, for Sir H. Davy's experiments seem to have been made with gas which was placed in a silk bag, and this gas was allowed to be breathed backwards and forwards into the bag.

Protoxide of nitrogen, or nitrous oxide, called by Priestley dephlogisticated air, is made by heating pure nitrate of ammonia in a flask to a temperature of 350° Fahr., when it puts on the appearance of ebullition, and is entirely decomposed into nitrous oxide and water,—

$$NH_4O,NO_5=4HO+2NO\text{; or, }NH_4NO_3=2H_2O+N_2O.$$

The gas should be collected over water, but cold water dissolves it to the extent of one volume, therefore warm water, in which it is less soluble, is frequently used in the pneumatic trough. If considerable quantities are to be collected, the same water should be returned to the gas-holder from time to time; it thus becomes saturated with the gas, and may then be used without being warmed.

In making the gas there are several precautions necessary. The nitrate of ammonia must be pure; if it contain chloride of ammonium or sulphate of ammonia the gas will be impure. If too great a heat be applied, there will be a complex decomposition, with production of some of the higher oxides of nitrogen. On the other hand, at a temperature a little below that at which the gas is produced, the nitrate of ammonia itself is sublimed, either with or without decomposition.

The following effects of the application of heat to nitrate of ammonia were observed and recorded by Sir H. Davy:—

1. Dry nitrate of ammonia undergoes little or no change below 260° F.
2. When heated to between 270° and 300°, it slowly sublimes without decomposition and without becoming fluid.
3. At 320°, it liquefies, decomposes, and still slowly sublimes. It never assumes nor continues in the fluid state without undergoing decomposition.
4. At temperatures between 340° and 480°, it decomposes rapidly, yielding pure nitrous oxide and water, as shown above.
5. If heated to 600° and above, the decomposition is accompanied by a luminous appearance of the salt, and nitric oxide, nitrous acid, and nitrogen are evolved.

In collecting the gas, when it is intended to be used for inhalation, it is desirable to pass it through solution of sulphate of iron and solution of potash or soda contained in separate Woulfe's bottles, before conveying it into the gas-holder. It would thus be purified from any of the higher oxides of nitrogen or other gas likely to be injurious that might be generated in the process.

Pure nitrate of ammonia can be easily procured; if not, it is readily made by saturating carbonate of ammonia with pure nitric acid, and crystallizing. One ounce of nitrate of ammonia yields about 500 cubic inches (nearly two gallons) of gas.

Nitrous oxide has been condensed into the liquid state by mechanical pressure.

M. Dumas, in 1848, compressed it in large quantities, using a very strong reservoir. It requires a pressure of thirty atmospheres before liquefaction commences.

Nitrous oxide in the liquid state is colourless, very mobile, and perfectly transparent. Each drop that falls upon the skin produces a very painful burn. The gas which is incessantly liberated by a slow ebullition possesses all the properties of protoxide of nitrogen. When in the liquid state it is perfectly miscible with alcohol and ether. Mr. Ernest Hart has suggested this plan of condensing the gas, and mixing it with alcohol, as rendering it more portable, the present mode of carrying it in india-rubber bags being very inconvenient. There are, however, at present mechanical difficulties to be overcome before the plan is available.

M. Dumas found that 2 pounds of nitrate of ammonia produced 44 gallons of gas, 20 gallons of which were pumped into the reservoir before any liquid was formed. The last 22 gallons gave about 6 fluid ounces of liquid nitrous oxide.

THE PHARMACY BILL.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—The successful progress of the "Sale of Poisons and Pharmacy Act Amendment Bill" through the House of Lords, renders it imperative that all concerned should examine its details as now proposed.

Fortunately, the mutual concessions that have been made have settled its essential principles, but we may reasonably expect that there are matters of detail open to improvement.

In common with many of my country brethren, I regard clause 20 as being such an instance. It states as follows:—

"Every person who is or has been in business on his own account as a chemist and druggist as aforesaid at the time of the passing of this Act, and who shall become a member of the Pharmaceutical Society, shall be eligible for election to the Council of the Pharmaceutical Society; but the said Council shall not at any time contain more than seven members who are not on the Register of Pharmaceutical Chemists, nor more than seven members who shall not, at the time of election, *bonâ fide* reside within twelve miles of highway or road from the General Post Office in St. Martin's-le-Grand."

The ultimate results of the clause are too uncertain to be fully predicted, since it permits the election of seven members of Council other than Pharmaceutical Chemists. This permissive system, subject to the power of a majority, may be regarded as hardly consistent with definite legislation; but let that pass, as my business now is with another point.

Like many other country members, I object strongly to the threatened limitation of our representative influence in the Council. For some years past the country members of Council have averaged nine, there being no restriction upon the numbers eligible, and, had the constituency so pleased, the whole Council might have been elected from provincial members.

It is now proposed to limit the number of country members of Council to seven, whilst fourteen are always to be drawn from the Metropolis. Let us consider the relative strength brought to the Society by the two classes, whose separation of interests seem thus invited for the first time by clause 20.

The annual financial statement of the present year gives us the following data for a comparison:—

	Number.	Subscriptions.
London Members	358 . . .	£375
Country ditto	1397 . . .	£1496

Thus, the country members comprise four-fifths of both the numerical and the monetary strength of the Society; but clause 20 would give as much governing power to 180 London members as to 1400 who live beyond the charmed circle of twelve miles radius. Is it seriously meant that one Londoner is as valuable to the Society as eight country supporters? Surely we are getting nearly to the equation,—"9 tailors=1 man!"

That clause 20 has what its framers supposed to be a *raison d'être* is certain. This is the large amount of committee work thrown upon the London members of Council, and the laborious and valuable services to the Society thus rendered deserve the gratitude of all our members; *per contra*, let it be remembered that all the places of honour are ungrudgingly offered to our London brethren. But perhaps nothing is more dangerous than a half truth, and it is not less a truth that representative government is a more healthy basis for corporations than a monopoly of governing power in a few hands. We have to reconcile these two truths, and no well-wisher to the Society can desire that any of its members should be indifferent to such a question.

Let ten country members hold seats at the Council, and probably all parties will be satisfied. Our present country representatives cannot ignore the duty of preserving intact the quota of governing power which now belongs to their class, and thus, independently of the threat of extinction held over two of their number by clause 20, they must feel bound to claim that nine seats at least shall be substituted for seven in the Bill.

Of course, the question might be treated in other ways. Seven country members of Council might have fourteen votes in a division, or four new members might be added to the Council. Again, electoral districts might be mapped out.

But I feel no disposition to advocate any of these changes. Let us, however, maintain our present representative influence in the new republic of pharmacy, to the possibility of which country members have contributed a faithful and unwavering support through times of doubting and discouragement.

Yours respectfully,

RICHARD REYNOLDS.

Leeds, June 19, 1868.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—I have received a copy of a circular which I find has also been sent to the Local Secretaries throughout the kingdom.

I confess that I read it with surprise and regret, that now—just as we seem to be on the point of attaining that for which we have struggled for many years, at a cost of time and exertion which none know but those who have borne the burden—the apple of discord should be thrown among us and the passing of the Bill, this session, be seriously endangered. Surely, if the proportion between town and country representatives is so unfair and unjust, it might have been found out before this; the Bill has been before the public for months and not a breath of objection on this account has ever reached the Council until now, when "its successful progress through the House of Lords" is pleaded as a reason why we should examine its details. Most persons will think that its details should have been examined *before*, and that the fact which has prevented our success hitherto—the want of agreement among ourselves—would be a very dangerous thing to fasten upon it as it entered the House of Commons.

The limitation objected to has been repeatedly brought before the general meetings which have been called to consider the Bill, the necessity of securing a large number of London members has been pointed out, and it is in compliance with the instructions of a public meeting, moved and urged by a country member, that the Council framed the clause. The sole reason is that which is only glanced at by Mr. Reynolds, that the constant demand made by committee meetings upon their time is so great a tax upon the London members that unless there be many to divide it, it is felt to be too heavy a burden, and the result would be that the real government of the Society would practically fall into the hands of two or three of its officers. It is not of course possible, or to be desired, that members should come two or three hundred miles to be present at committees, to say nothing of the expense to the Society, and there must therefore be a large proportion of men near at hand to divide the duty, or representative government would be worse off than ever.

It does not follow that the interests of country members would be neglected because the large majority of the Council were from London; the uniform support and re-election of the London members by their country constituents proves their conviction that whenever important questions have arisen the Council has always sought for and carried out the wishes of the trade at large, and they will, I am sure, feel that it it is an unworthy return for their labours, to do anything which may tend to raise up class rivalries, and to create the belief that the interest of one part of the Society clashes with the other. Mr. Gladstone may be a very fit representative of South Lancashire, and Mr. Hardy, of Oxford, although neither of them are residents; and it is not necessary for a man to live in Birmingham or Bristol, in order to do his best for the chemists who do so.

I have no doubt that when the Council meet on July 1st, they will give Mr. Reynolds's letter their careful consideration, and act as they think best for the good of the members at large, but their decision may not be known by all, until the August number comes out; and as one who has borne his part in the labours necessary for bringing about the present hopeful state of things, I cannot allow this July number to go forth throughout the country without adding my protest against a step which has already raised agitation in every direction, which may peril the success of the Bill, and which seems to me inexcusable *now*, because, if so important, it ought to have been brought forward and settled before the measure was introduced into Parliament.

I am, Gentlemen,
Yours faithfully,
GEORGE EDWARDS.

Dartford, June 26, 1868.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—Knowing that a difference of opinion exists among country members regarding the working of clause 20 of the new Pharmacy Bill, where it restricts the number of provincial members on the Council to seven, I beg to offer a few words upon the point.

It is very evident that in a Society with so large a preponderance of country members, the country influence can at any time determine the election or rejection of any member of Council, when it is known that his views are in accordance with or in antagonism to those of his constituency, and, consequently, that it is not *essential* that country councillors should be elected to represent country members, at any rate in any large proportion.

At one time I advocated an increase in the country members of Council, because I felt that metropolitan experience was so widely different from my own, and that of others with whom I conversed upon pharmaceutical politics, that the Council really did not represent the body. But the agitation of the last few years has altered the complexion of the Council, both from a change in its members and a change in the evidence upon which the old members founded their opinions. The present constitution of the Council enables them to elect without difficulty a sufficient number of resident members for their working committees while no great class interests are being agitated, and, on the other hand, enables the members to select their representatives from town or country whenever any important question arises calling for the more intimate acquaintance of the representatives with the circumstances of their constituency. Thus while I would not wish to see the number of country representatives limited to seven, I would no more wish to have it implied that country interests could not be fairly represented in a Council numbering only seven country members.

The provincial councillors will, on an average, travel 300 or 400 miles each time they attend a council meeting, and will not lose less than two days,—while the London members will only travel one-hundredth part of the distance and only spend an eighth of the time for each time they sit in Council; this great difference will always make the proportion of sitting members preponderate greatly in favour of the Metropolis, and will throw the burden of the routine work upon their shoulders. Any Council consisting mainly of provincial men would have difficulty in getting satisfactorily through their work; but the whole experience of the Society shows that there is little fear of the country members selecting their representatives too exclusively from the provinces, so long as the London men show their appreciation of provincial wants and their willingness to represent them. To put it out of our power to elect freely from our neighbours as many councillors as we feel necessary to represent our views, is like stealing a march upon our liberties, and appears to shield the London councillors from the natural consequences of their failing to represent the wants of their country cousins. Under the proposed change we could not turn them out, because the law would not allow us to elect other than two-thirds London men; but while it is improbable that occasion for such a revolutionary turn-out should arise, it is a salutary feeling to both Council and constituency that the country members have it in their power to represent themselves if the Metropolis failed to afford them a fair representation.

The greatest difficulty country electors have is to make acquaintance with the feelings and doings of the various candidates for office.

There are questions—such as the institution of local examinations—which the country members feel have been neglected, much to our injury; but when the more immediate pressure has been removed, by a settlement of the question now before us, I have no doubt that a decided agitation of the country members in favour of it would either alter the views of the old Council upon the subject, or cause the election of such a Council as would carry this measure also before long.

In conclusion I would say, let the constitution of the Council, as regards town and country elements, stand as it is, rather than introduce a change which implies a want of confidence between the two sections of the members, and which by implying may create it.

BARNARD PROCTOR.

11, *Grey Street, Newcastle, June*, 1868.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—I shall be glad to be allowed, through the medium of the Pharmaceutical Journal, to call the attention of country members to clause 20, which seriously restricts the number of country members of the Council. I think the present Council, in sanctioning this clause, cannot have seriously intended to commit so great an injustice. The country members are "eighty per cent." of the whole body, and it is proposed to give them "thirty-three per cent. of voting power." Surely this cannot have been observed, and only wants calling attention to, to secure its alteration in the House of Commons.

In the poison schedule are included aconite and belladonna and their preparations. I strongly urge that they be omitted, as in some cases I know if they be retained, the action of the law will be very injurious. These drugs and their preparations are seldom sold except to homœopaths, and there is a growing tendency on the part of these practitioners to adopt, what are termed, the "mother tinctures," which may be considered about equal in strength to the ordinary pharmacopœia preparations. Now in most country towns, the homœopathic trade is being carried on by the regular chemists; and, I presume, if the Bill passes in its present form, not only the strong tinctures but every one of their dilutions, even down to the sixty-fourth, will be prohibited. How is this difficulty to be met,—particularly as, no doubt, under this Bill all of those now called homœopathic chemists will be admitted to the Society?

I strongly object, too, to the confusion of titles that must arise if this Bill be carried. The present pharmaceutical chemists have fairly earned their positions, and it is an injustice to give the title of Members of the Pharmaceutical Society to others as now proposed. The public will never distinguish between the two.

Trusting the "guardians" of the Bill will see fit to alter these objectionable points,

I am, yours faithfully,

T. W. Gissing.

Wakefield, June 17, 1868.

POISONOUS PROPERTIES OF HEMLOCK.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—In my observations on the properties of the plants of the *Umbelliferæ*, in the Pharmaceutical Journal for June, I stated that the plants of this Order contained, as an essential principle, a narcotico-acrid juice, often present,—often, however, by external influences, undeveloped and non-existent. That this non-development may occur even in those plants considered as always possessing poisonous qualities, I brought forward, as a proof, the fact that some of the hemlocks grown near Edinburgh were found to be comparatively harmless. But the example I gave, *Conium maculatum*, was not, I believe, one of those umbellifers experimented upon. The plants of this Order, usually poisonous and here found to be innocuous, were *Cicuta virosa* (water hemlock) and *Œnanthe crocata* (hemlock water dropwort).

I remain, Sir, your obedient servant,

Frank H. Lescher.

London, June 24th, 1868.

ABSTRACTS AND GLEANINGS FROM BRITISH AND FOREIGN JOURNALS IN BOTANY, MATERIA MEDICA, AND THERAPEUTICS.

"Mata."

BY E. S. WAYNE.

The herb, called "mata" by the Mexicans, is in common use in New Mexico, as an addition to tobacco in smoking. A small quantity of it is rubbed to a coarse powder in the palm of the hand, and then mixed with the tobacco, to which, in burning, it imparts a very agreeable odour, and at the same time prevents or corrects the disagreeable odour of stale tobacco-smoke upon the clothing, and in apartments.

It was introduced into use here by Major M'Crea, U.S.A., and since has become quite in demand by smokers (those who use the pipe). I have had much difficulty in obtaining any quantity of the article, and then only at an enormous cost. I was fortunate enough this season to obtain a quantity of the seed of the plant, and have been successful in growing a crop, specimens of which are herewith sent, also some of the seed. The plant is rather insignificant in size; the inflorescence is very minute, white, corolla entire, and finely cleft. I have not been able to make out its Natural Order, or to find a description of it in any work at my disposal. It is not described in the Pacific Railroad Survey (in the botanical section of that Government Report). The odour, when burnt in a pipe, is similar to that of the tonquin bean, and I presume it owes the same to the presence of coumarin in the plant.—*Proc. Amer. Pharm. Assoc.*, 1867, *in Amer. Journal of Pharmacy.*

The following note is appended by Professor Maisch:—At the request of Professor Wayne I have examined the specimens sent. The seeds consisted of the empty involucres and the achene (with the pappus much broken) of a *Eupatorium.* The dried plant was without flowers, but bears a striking resemblance to some of our Northern species of this genus, and corresponds closely with the description of *Eupatorium incarnatum*, Walter. This species is indigenous to Texas, but is found as far east as Florida and Georgia.

Fungi in Disease.

At a recent meeting of the Pathological Society, the President announced that he had received from Professor Hallier, of Jena, the observer who last year published the statement that he had traced a constant connection between cholera and the existence of a certain fungus in the intestinal canal, a letter, in which he communicated the fact that he had established, as he believed, a connection between six diseases and different species of fungi. These are, variola and the allied diseases, variola ovina and vaccinia; measles, typhus, and typhoid fevers. In the three latter the fungi were discovered in the blood. In the three former Mr. Simon presumed that the fungi were found in the vesicles or pustules. This fact was stated to have been verified by the examination of specimens taken from different sources and in different epidemics. If confirmed, it is difficult to overrate the interest and value which attach to it.—*Med. Times and Gazette.*

Production of Disease by Fungi.

Dr. J. H. Salisbury, who, it will be remembered, a year or two ago announced that he had discovered a connection between certain palmelloid cryptogamic bodies, which he named "ague plants," and intermittent fever, now publishes, in the January number of the 'American Journal of the Medical Sciences,' that he has observed two new algoid vegetations, one of which he believes to be the cause of syphilis, and the other of gonorrhœa. The *Crypta syphilitica* he describes as a minute, transparent, highly refractive algoid filament of uniform

structure, having the extremities obtusely rounded. They are developed from spores, and may be straight, coiled, or arranged in curves. Dr. Salisbury states that he has found these filaments in the bed of chancres and in the blood of persons affected with secondary syphilis. The *Crypta syphilitica* finds a fertile soil in the connecting tissues. The *Crypta gonorrhœa*, also an algoid plant, having a filamentary form, according to Dr. Salisbury, is limited in its invasion to the epithelial tissue, whilst the *Crypta syphilitica* is mainly confined to the connective, cartilaginous, and osseous tissues. Several figures of these algoid vegetations are appended to Dr. Salisbury's paper.—*Med. Times and Gazette.*

Gentian Root as a Dilator.

Professor Winckel, in Rostock, recommends (Deutsche Klinik, 1867) the Radix Gentianæ rubræ as a new, simple, and cheap means of dilatation for surgical and gynecological purposes. His attention was first directed thereto by an article of John Jacob Haeberl, published in 1834, in which the author states, that having operated for atresia uteri and desiring to keep open the orifice made by the trocar, he introduced a good firm plug of Radix gentianæ, and that on the following day he found no small difficulty in withdrawing the same, which had increased to twice its former size. According to Dr. Winckel's observations the gentian root has the following advantages over laminaria:—(1st.) Its cheapness, the ease with which it can be obtained, and the fact that the physician can so easily cut plugs and bougies of any size to suit his requirements. (2nd.) Its somewhat smaller power of absorption, as compared with laminaria, is compensated by our being able to obtain larger pieces of it (one and one-half to two inches in diameter) so that it can be used for the dilatation of openings already too large for laminaria. (3rd.) The fact of its *remaining free from smell* constitutes an immense advantage, for even laminaria, though in a much less degree than sponge-tents, often becomes quite fetid.

The Radix gentianæ may therefore be used with special advantage in strictures of the vulva, vagina, and uterus; for tamponing the uterus in smaller hæmorrhages, for the induction of abortion, for dilatation after operations for atresia of the genital organs. Whether it is also applicable to stricture of the urethra, to affections of the lachrymal ducts, etc., remains to be seen.—*All. Med. C. Ztg.*, 1867; *Memorabilien.*

On the Relative Value of the Rhizoma and Radical Fibres of Podophyllum Peltatum in the Manufacture of Podophyllin.

BY WILLIAM SAUNDERS.

In commerce it is well known that samples of the rhizoma of *Podophyllum peltatum*, freed from the radical fibres, are preferred, and command a higher price; and also that the presence of an unusually large proportion of fibres is regarded as an evidence of inferiority. This preference may, in some cases, originate from the fact that the fibres are often associated with a considerable quantity of dust and other foreign matter, but however clean they may be made, the prejudice still exists in their disfavour.

To determine how far this objection is grounded on any deficiency of strength in the fibres as compared with the rhizoma, the following experiments were tried:—

Eight ounces of the rhizoma, carefully freed from fibres, were ground in a Swift's drug-mill sufficiently fine to pass through a sieve of twenty-five meshes to the inch. Eight ounces of root fibres, free from rhizoma, were treated in a similar manner. These were each moistened with four ounces of alcohol, and packed in separate percolators. After macerating for twenty-four hours, fresh

alcohol was added in small quantities at a time, until twenty ounces had passed through each, when the material was found to be exhausted.

The tinctures were evaporated to the consistence of syrup, and precipitation effected with water alone, according to the United States Pharmacopœia, when the precipitates were carefully collected and dried. From the rhizoma the yield was one hundred and thirty-seven grains, and from the radical fibres one hundred and thirty-seven and a half grains,—showing that there is no reason for regarding samples of root containing a large amount of fibres as in any way inferior, provided they have been carefully cleaned.—*Proc. Am. Pharm. Association*, 1867.

Truffle Hunt at Cannes.

As it is now the very height of the Truffle season, and as this place is within a reasonable distance of some of the best Truffle-producing districts of France, it is not to be wondered at if some of us English, who are here for the winter, should have felt a strong desire to see the habitats of these redoubtable tubers, and the mode in which they are hunted by the natives. An expedition was organized accordingly, in which the noble president of the Royal Horticultural Society, myself, and a score of other friends took part, and which "came off" very successfully on Tuesday last. The little town of St. Vallier, which stands about 2500 feet above the level of the sea, was the point for which we made, and we reached it about two o'clock, after a magnificent drive of four and a half hours, very hungry and quite ready for luncheon. Fortunately, luncheon was quite ready for us at the Hôtel du Nord, and including as it did various *plats*, in which Truffles that had not seen the light for more than a few hours, played a prominent part, this proved a very instructive as well as a very savoury and agreeable meal. This important part of the business over, we called for the "hunters," active little fellows, carrying leathern bags, and provided with short instruments, something between a pick and a hoe, rendered indispensable by the stony character of the ground in which the Truffles are wont to be found. We had not to go far in search of sport, for within a few hundred yards of the inn we reached a sort of wilderness, in which bushes of low scrubby white Oaks (*Quercus Cerris*) formed the whole above-ground vegetation, and as it is only in the bare open spaces among the bushes that Truffles occur, it was to these, of course, that the attention of the hunters was confined. In former times dogs, which are still used for the purpose in Sussex, would have been employed to scent out the whereabouts of the unctuous tubers, and at a much more recent period the same office would have been discharged by pigs, but the assistance of either dogs or pigs is now—in France at least—entirely dispensed with, and flies have taken their place. It seems that a certain sort of fly, not very unlike what one sees about farmyard manure heaps, only that it has spots on its wings, has a peculiar affinity for the Truffle, and is always found hovering about the places where Truffles grow, probably with the view of depositing its eggs in them. No sooner, therefore, did the hunters notice a dozen of these truffle-flies brooding over a particular spot, than they immediately set to work to dig the tubers out; the latter, however, were never found more than one at a time, nor ever at a greater depth than 6 or 8 inches. The soil in which they grew was sandy, of a dark ochreous brown, and traversed by the roots of the Oaks, on which sometimes, though by no means always, the tubers seemed to rest. When once found they were easily dislodged, and several ladies of our party performed this feat in turn. The fresh tubers smell exceedingly strong, and the soil about them is impregnated for some distance with their powerful and peculiar odour. I wish I could add that we discovered anything that would seem at all likely to give a clue to the solution of the difficulty that has hitherto baffled all attempts to cultivate them. Even when found they are rare, and command a very high price; no wonder, then,

that in the course of our hour's Truffle-hunting we were warned off half-a-dozen times.—*Gardeners' Chronicle.*

ABSINTHE.

Much has been written lately in the daily press and medical journals on the effects of absinthe drinking, now becoming so general among all classes in France. The following article first appeared in the 'Pall Mall Gazette':—

"The indulgence in absinthe which already prevails to a great extent among all classes of Frenchmen threatens to become as widespread in France and as injurious there as opium-eating is in China. If a visitor to Paris strolls along the Boulevards from the Madeleine to the Bastille some summer's afternoon, between five and six o'clock, which is commonly called the 'hour of absinthe,' he can hardly fail to remark hundreds of Parisians seated outside the various cafés, or lounging at the counters of the wine-shops, and imbibing this insidious stimulant. At particular cafés, the Café de Bade, for example, out of fifty idlers seated at the little round tables forty-five will be found thus engaged. But it is not on the Boulevards alone that absinthe is the special five o'clock beverage. In most of the wine-shops in the Faubourgs, in the Quartier Latin, and round about the École Militaire, you may see at that particular hour workmen, students, soldiers, clerks, charbonniers, chiffonniers even, mixing their customary draughts of emerald-tinted poison, and watching the fantastic movements of the fluid as it sinks to the bottom of the glass, wherein it turns from green to an almost milky-white, at the moment when the perfumes of the various aromatic plants from which it is distilled disengage themselves. A quarter of a century ago, absinthe was the drink of French coachmen, grooms, and footmen, and people of the lowest class; to-day its most ardent lovers are to be found among educated and well-to-do Parisians. Literary men, professors, artists, actors, musicians, financiers, speculators, shopkeepers, even women, yield themselves up to its seductive influence—to those indefinable provocations which seem, they say, to impart renewed activity to an enfeebled brain, developing a world of new ideas, and which thus, it is believed, have inspired many a noble work of imagination in literature and art. It may be so, but then those who habitually excite the brain with absinthe soon discover that they can produce positively nothing without its aid, and that a time arrives when heavy stupor supersedes that excitement of the intellectual faculties which once seemed so easy and so harmless. After the first draught of this poison, which Dr. Legrand, who has studied its effects, pronounces to be one of the greatest scourges of our time, you seem to lose your feet, and you mount to a boundless realm without a horizon. You probably imagine that you are going in the direction of the infinite, whereas you are simply drifting into the incoherent. Absinthe affects the brain unlike any other stimulant; it produces neither the heavy drunkenness of beer, the furious inebriation of brandy, nor the exhilarant intoxication of wine. It is an ignoble poison, destroying life not until it has more or less brutalized its votaries, and made drivelling idiots of them. There are two classes of absinthe drinkers. The one, after becoming accustomed to it for a short time, takes to imbibing it in considerable quantities, when all of a sudden delirium declares itself. The other is more regular, and, at the same time, more moderate in its libations; but upon them the effects, though necessarily more gradual, are none the less sure. Absinthe drinkers of the former class are usually noisy and aggressive during the period of intoxication, which, moreover, lasts much longer than drunkenness produced by spirits or wine, and is followed by extreme depression and a sensation of fatigue which are not to be got rid of. After a while the digestive organs become deranged, the appetite continues to diminish until it is altogether lost, and an intense thirst supplies its place. Now ensues a constant feeling of uneasiness, a painful anxiety, accompanied by sensations of giddiness and tinglings in the ears; and as the day declines hallucinations of sight and hearing begin. A desire of seclusion from friends and acquaintances takes possession of the sufferer, on whose countenance strong marks of disquietude may be seen; his mind is oppressed by a settled melancholy, and his brain affected by a sort of sluggishness which indicates approaching idiocy. During its most active moments he is continually seeing either some imaginary persecutor from whom he is anxious to escape, or the fancied denun-

ciator of some crime he dreams he has committed. From these phantoms he flies to hide himself, or advances passionately towards them protesting his innocence. At this stage the result is certain, and dissolution is rarely delayed very long. The symptom that first causes disquiet to the habitual absinthe drinker is a peculiar affection of the muscles, commencing with fitful contractions of the lips and muscles of the face and tremblings in the arms, hands, and legs. These are presently accompanied by tinglings, numbness, and a distinct loss of physical power; the hair falls off, the countenance becomes wan and sad-looking, the body thin, the skin wrinkled and of a yellowish tinge, —everything, in short, indicates marked decline. Simultaneously with all this, lesion of the brain takes place; sleep becomes more and more disturbed by dreams, nightmares, and sudden wakings; ordinary illusions, succeeded by giddiness and headaches, eventually give place to painful hallucinations, to delirium in its most depressing form, hypochondria, and marked impediment of speech. In the end come entire loss of intellect, general paralysis, and death. There are two kinds of absinthe consumed in Paris, the common and the Swiss absinthe, the latter of which possesses almost double the intoxicating properties of the former. A few years ago the consumption of the common absinthe was three times that of the Swiss; but now the proportions are reversed, and four times as much Swiss absinthe is drunk as of the common quality. According to official statistics, France receives from Switzerland nearly 2,000,000 gallons of the noxious compound annually; in addition to which an enormous quantity, made in Paris, is sold as the veritable Swiss production. Genuine absinthe is distilled from the leaves of major and minor absinthe, angelica roots, *Calamus aromaticus*, aniseed, dittany leaves, and wild marjoram, all of which have been previously bruised and soaked for a period of eight days in alcohol. A quantity of oil of aniseed is then added, and the whole is carefully mixed together. Occasionally fennel, mint, etc., enter into the composition. The utmost care is taken to obtain the right shade of colour, and to ensure the liquid expanding and whitening well when mixed with water. Should it prove to be deficient in these qualities the manufacturer does not hesitate to add indigo, hyssop, nettles, and even to have recourse to sulphate of copper to obtain the precise tint of green, or chloride of antimony to produce the milky-white precipitate, both of these chemicals being deadly poisons. Paris actually has its clubs of absinthe drinkers, the members of which are pledged to intoxicate themselves with no other stimulant, and even to drink no other fluid,—the only pledges, it is believed, which they do not violate. They assemble daily at some appointed place of rendezvous at a certain hour, and proceed to dissipate their energies and their centimes in draughts of that fatal poison which fills the public and private madhouses of Paris. These absinthe-drinking clubs are certainly not numerous, but liquor shops abound in all quarters of the city where absinthe may be said to be the staple drink, and lately several have sprung up which, to attract the youth of Paris to them, dispense the insidious beverage at the hands of pretty women. In the French army drinking of absinthe of the cheapest quality, and, as a matter of course, the most deleterious of all, used to prevail to such an extent that both military and medical commissions were appointed to report upon the practice and the effects resulting from it. The facts that came to light were so alarming that the Government not only formally interdicted its consumption, but made every endeavour to keep it beyond the reach of the soldiers. In Paris and other garrison towns these efforts were not particularly successful; but it fared hard with any camp followers of expeditionary corps in Algeria, or at Chalons or other parts of France where temporary camps were formed, who chanced to be detected in supplying absinthe to the troops. In the French navy its consumption is rigidly prohibited, not merely to the common seamen but to the officers as well."

The 'Lancet' thus comments upon the above :—

"We think it time that an authoritative and exhaustive inquiry should be made as to the effects of excessive absinthe-drinking, about which a great deal is being said just now, not merely by medical men, but by the public. It is quite clear that a great deal of what has been said is mere nonsense, and will not bear a moment's investigation. And when one reads carefully even the seemingly authoritative description of the symptoms given by M. Legrand, and quoted the other day by the 'Pall Mall Gazette,' it is impossible to fix on any definite peculiarities which clearly distinguish poisoning by ab-

sinthe from poisoning with any other concentrated alcohol, taken in small doses repeated with extreme frequency. It may be remembered by some of our readers that some five years ago, when absinthe was beginning to make a noise in Paris, by reason of its having become the drink of fashionable idlers, instead of being the vulgar luxury of peasants and labourers, a clever young physician, F. Moreau, wrote a careful treatise, in which he formally denied that the absinthe (or wormwood) in the liquor had any specific poisonous effect whatever; in fact, if our memory serves us, he declared that there was very often *no* absinthe in the liquid sold under that name. At any rate, he totally denied that the symptoms were due to anything but the alcohol, and (to a very limited extent) to the adulteration with salts of *copper* which is sometimes practised. His opinion was opposed by M. Marcé, who concluded, from certain experiments, that absinthe has a special tendency to produce intellectual dulness, with terrifying hallucinations, and a very rapid and complete degeneration of the mental powers. For our own part, we have never been convinced that there is anything in the symptoms of acute or chronic *absinthism*, as they are described, essentially different from those of acute or chronic *alcoholism* which has been produced by the imbibition of innumerable drams of any spirit. We have repeatedly seen the whole train of symptoms, which are now so much talked of, produced by the constant drinking of brandy or rum. As for hallucinations, there is nothing more common. At any rate, it will take a good deal of very solid and precise evidence to convince us that the trifling amount of essence of wormwood contained in the liquor called absinthe, adds any considerable poisonous power to the natural influence of some 20 or 30 ounces *per diem* of a highly concentrated alcohol, which is what many of these Parisian *buveurs* actually dispose of in the course of innumerable visits to the *cafés* and other houses of refreshment."

In reply to this, a correspondent of the 'Pall Mall Gazette' has published the following article from Pereira's 'Elements of Materia Medica,' on the *physiological effects* of wormwood:—"In *moderate doses*, it produces the ordinary effects of the *aromatic bitter tonics*. Its bitter principle becomes absorbed; hence the flesh and milk of animals fed with it are rendered bitter. Borrich says that the milk rendered bitter by it proves noxious to the infant.

"*Large doses* irritate the stomach and excite the vascular system; a specific influence over the nervous system, characterised by headache, giddiness, etc., has been ascribed to it. This has usually been supposed to depend on the volatile oil; but a similar power has been assigned to the bitter principle."

It has been concluded, therefore, by some that the injurious effects of excessive and long-continued absinthe-drinking are due to the wormwood it contains, and not to the alcohol. Others have ascribed its injurious effects to *Calamus aromaticus*, which is said to be one of its constituents. Pereira says with regard to this substance, that "it is rarely employed by medical practitioners, though it might be frequently substituted with good effect for the more costly Oriental aromatics. It is a useful adjunct to other stimulants and tonics." He thus sums up its *physiological effects*:—"It is an aromatic stimulant and mild tonic. Vogt arranges it with the *excitantia volatilia*, and regards it as approaching angelica root on the one hand, and cascarilla and angustura barks on the other." It seems quite clear, therefore, that no injurious effects could be caused by this substance. The other supposed vegetable constituents of absinthe are angelica, dittany, aniseed, and marjoram—all well-known vegetable substances, and perfectly harmless. From our knowledge of the physiological effects of the different vegetable constituents of absinthe, the only one which has been shown in any degree to produce injurious effects is wormwood; but until far more experiments upon the animal body have been tried even with it, we must agree with those writers who attribute the injurious effects of excessive absinthe-drinking to the alcohol it contains, rather than to its vegetable constituents.

INDELIBLE MARKING-INK PREPARED FROM ANILINE.

An indelible marking-ink is prepared from aniline by mixing the two following solutions: *a*, cupreous solution—8·52 grm. of crystallized chloride of copper, 10·65 grm. chlorate of soda, and 5·35 grm. of chloride of ammonium are dissolved in 60 grm. of distilled water; *b*, aniline solution—20 grm. of hydrochlorate of aniline are dissolved in 30 grm. of distilled water, and 20 grm. of a solution of gum arabic (1 of gum to 2 of water) with 10 grm. of glycerine are added. By mixing in the cold four parts of the aniline solution with one part of the cupreous solution, a green liquid is obtained which can be used immediately for tracing characters upon linen; the marks, however, alter after the lapse of a few days. It is necessary to keep the solutions separate until required for use. If the fluid does not flow easily from the pen, it may be diluted without fear of diminishing the intensity of the tint, which, at first green, gradually darkens and becomes black. Heat causes the change to take place instantaneously; a steam heat is sufficient, and is better for the fabric than a hot iron. Afterwards the linen is washed in warm soap and water. This ink resists acids and alkalies, and is remarkably permanent.—*Chemical News*, *April* 10*th*, 1868

THE PROPERTIES OF BENZOLINE, OR SPONGE-LAMP SPIRIT.

The rapid development of the demand for sponge-lamps and the spirit which they burn renders it very important that the shopkeeper who is called upon to deal in the spirit should properly understand its properties. This is the more necessary from the fact that considerable misapprehension exists in reference to these properties. The liquid in question is a very volatile hydrocarbon bearing many names, such as petroleum spirit, paraffin spirit, benzoline, spongeline, etc. etc. There are three distinct articles to which these names are given almost at random. First, petroleum spirit properly so called. This is the more volatile constituent of the crude petroleum, from which it is obtained in considerable quantities. It is that which first comes over in the course of distillation, and which should always be separated and kept quite distinct from the burning oil, or ordinary refined petroleum for lamps. Before the sponge-lamp was invented, when this spirit was a drug in the market, not worth one halfpenny per gallon to the American refiner, the American burning oils were largely adulterated with it, and to this the explosions that have occurred are to be attributed. Now that it is worth 50 per cent. more than the burning oil, there is little fear of our American cousins using it for the purpose of adulterating the cheaper article, and therefore our ordinary oils are now so much safer, that the application of the old tests of igniting-points has almost become obsolete. Oils are now far more likely to be too heavy than too light. The second kind of spirit, almost identical with the first, is that obtained in like manner from cannel and shale oils; it is the more volatile portion of the crude paraffin oil, and is separated in like manner at the first stage of refinery distillation. The manufacturer of cannel and shale oils has a smaller proportion of this in his crude than the refiner of petroleum has, inasmuch as in the course of the primary distillation of the cannel, etc., in the retort, much of this spirit is decomposed and burned away to waste. The third kind is made from the liquid refuse of gas-works, and really contains a good deal of benzole. The best of these is the petroleum spirit, and the worst is the third kind. Very little of this latter is, however, in the market. As all these are dangerous articles, it is quite necessary that the dealer in them should know how to store and handle them, and also that he should be disabused of the false terrors which prevail in some quarters. In the first place these liquids are *combustible*, but not *explosive*. There is an important practical as well as theoretical distinction here, which should be clearly understood. Any substance which will burn by combining with the oxygen of the atmosphere is combustible: paper, wood, coal, sulphur, etc. etc., are examples of this. None of these will burn without a supply of air. On the other hand, gunpowder, nitro-glycerine, gun-cotton, and the fulminates (such as are used for percussion-caps, etc.), will burn without being supplied with air, because they contain within themselves the oxygen necessary for the combustion of their other combustible materials. The first class of substances, those which require a supply of air, *can only burn on their surface*, where

the air comes in contact with them, and *hence they burn gradually*. The explosive substances *may burn simultaneously all throughout their substance*, wherein the oxygen is diffused, and hence they burn so rapidly as to cause what we call an explosion. The great expansion which takes place at the moment of explosion gives the propulsive power to gunpowder and other substances which, in the act of explosion, convert solids or liquids into gases. The sudden formation and expansion of these gases do the chief mischief which accompanies explosions. Thus, common cotton wool is combustible, and if fired will burn all over its surface, and gradually through, with a degree of rapidity dependent upon the supply of air. Gun-cotton, on the other hand, is the cotton fibre somewhat altered, and united with a supply of oxygen in the form of a solid compound from which the oxygen is liberated as a gas when it is heated. Thus, every fibre is associated with its own supply of oxygen, and the result is the rapid combustion, independent of the atmosphere, which we call explosion. Now, the spirit of which we are treating is not explosive, as many suppose. It is no more capable of burning below its surface than water is. It can only burn as spirits of wine, spirits of turpentine, etc., do,—that is, upon the surface, and only there when supplied with air; and it can only continue burning on the surface so long as the supply of fresh air is continued. The notion that such spirit, if fired, will go off like a train of gunpowder is therefore quite fallacious. If an iron cylinder, with only one opening, were filled with this spirit, and the spirit were fired, it could only burn at the opening, and the size of the flame would be proportionate to the size of the opening. The spirit could not burn within the vessel, and if by any means the opening could be stopped, the combustion would immediately cease. These simple principles enable us at once to understand how it is that water thrown upon such a liquid when burning will, in most cases, increase the conflagration. Being of an oily nature, the spirit does not mix with water as spirits of wine would; and, being much lighter than water, it floats upon the water. Thus, if any vessel were filled with the burning spirit, and we poured water upon it, the water would sink to the bottom, and the spirit would overflow, and, in overflowing, expose a larger surface to the air, and thus get more oxygen, and burn more rapidly. When, therefore, such a liquid is on fire, our efforts should be directed to confining and smothering it, and the use of water avoided. So far we have only considered the liquid, but now we come to the vapour of the spirit. This is given off very freely, and it is in fact this which burns at the surface of the liquid in the case already considered. Now this vapour, though not explosive itself, may readily mix with air, and the mixture constitute an explosive compound of a very dangerous character. Let us suppose the case of a steam-boiler with only one opening, say the man-hole, *filled* with the spirit. If a light were applied, there would be a blaze, but no explosion, and the flame would be limited by the size of the man-hole. Now, let us suppose the same boiler with only a small quantity of liquid spirit on the bottom, and this left for a while at a summer-heat temperature; vapour would be given off from the spirit, and the space inside the boiler would in due time become a mixture of this vapour and air. Here we should have the oxygen pervading the substance of the combustible, as in the gun-cotton, etc., and accordingly the mixture would be truly explosive; and if a light were now applied, we should have a dangerous explosion inside the boiler, instead of merely a flame at the man-hole. If an ordinary oil-can were full of spirit, and a light applied to the mouth, merely a flame would result, which might be extinguished at once by coolly and firmly inserting the cork. With a knowledge of these properties, any man or woman with ordinary courage would be able at once to extinguish such a can of spirit. A cloth would do it easily. Without this knowledge, and under the delusion that the liquid is explosive, the can would probably be dropped, the spirit would flow from it, and, spreading out in contact with a greater and greater surface of air, the conflagration would be frightful. If, again, a can were partly filled with spirit, and by any carelessness a light brought near to it, so as to explode the mixture of air and vapour above the spirit, it is of the utmost importance to remember that this instantaneous explosion is *all* the *explosion* that can occur; that in ninety-nine cases out of a hundred such an explosion would not burst an ordinary tin can; and that, all the mischief being over at the moment of the explosion, the safest thing the holder of the can can do with it is to "stick to it." *Never in any case drop it.* Whatever the explosion may do, it *has* done all its worst when you have seen and heard it. The greatest danger is that of *spilling the spirit*, and this is doubtless the cause of all the mischief we hear of. In order to have a clear idea of the real nature

of this explosiveness, take a soda-water bottle and put into it about a tablespoonful of the spirit, and shake this up for a little while in the bottle, then hold the bottle by the bottom in one hand, and with the other apply a light to the mouth. This is a perfectly safe experiment, if you hold fast. The writer has repeated it times out of number, and all who witness it are surprised at the feebleness of the explosion, and cured of the foolish fears which are really the chief source of danger. This should be tried out-of-doors, or where there are no combustibles, in case of dropping the bottle. All who deal in these spirits should store them out-of-doors, and handle them carefully, but nevertheless fearlessly. It is very unsafe to keep it in a cellar, especially if the cellar is ill ventilated, for should any leakage occur in such a place, the vapour may easily accumulate so as to make the whole atmosphere of such a cellar an explosive compound. The violence of the explosion will be proportionate to the quantity, and therefore very different from that of the soda-water bottle. The spirit should be stored in a metal tank or cylinder, not in wooden barrels, inasmuch as the liquid saturates the wood, and evaporates from the surface. Thus a barrel of spirit is unsafe in a close room, even if there is no leakage as commonly understood. In the open air, of course, this vapour is dispersed as rapidly as it is formed, and therefore does no mischief. As the spirit is imported in barrels of about thirty-four gallons each, and can be purchased most advantageously in these original packages, the shopkeeper should have in his backyard, or other convenient place *out-of-doors*, one or more metal drums of about thirty-six gallons capacity, according to the stock he orders at once. Into these the spirit should be emptied immediately it arrives, and the drum immediately closed. The spirit should be drawn from a tap for retailing. The pouring of the spirit from the barrel into the drum requires especial care, and no light should be brought within many yards at the time, or for some two or three hours afterwards. It must be remembered that to fire this spirit it is not necessary to bring the light in actual contact with the liquid, as it is the vapour which fires, and there is always hovering over the surface of the liquid an explosive film of mixed vapour and air. This extends an inch or two in cold weather, and much further as the temperature rises. It is this which causes the slight detonation which is heard on lighting any quantity of spirit. This may be shown by placing a little in a saucer, and bringing a lighted spill or taper gradually towards the surface. We have gone thus fully into the properties of this now important article of commerce, on the principle that "forewarned is forearmed," and from the fact that we have had many inquiries as to the "explosiveness" of the spirit, and that mischief has already arisen from carelessness on the one hand, arising from ignorance of the dangerous properties of the liquid, and on the other hand from fright and panic, caused by exaggerated and misapplied notions of its explosiveness, the true nature and limits of which we have endeavoured to explain.—*From the 'Oil Trade Review.'*

DEBATES IN THE HOUSE OF LORDS ON THE BILL TO REGULATE THE SALE OF POISONS, AND ALTER AND AMEND THE PHARMACY ACT OF 1852.

The following discussions occurred as the Bill passed through different stages:—

On going into Committee on the Bill, on June 15th, 1868,

Earl Granville said: My Lords,—This Bill was read a second time without any discussion, and I therefore propose to explain its provisions. Some years ago the Lord Chief Baron Kelly, when a Member of the House of Commons, introduced a Bill upon this subject, and thereupon a second Bill was introduced by another honourable Member. Both Bills were referred to a Select Committee, and, objections appearing to both of them, neither passed a further stage; but the Select Committee passed a resolution that no person ought to be allowed to sell poisons who had not been subjected to an examination by a competent body. The object of this Bill is to carry out the views of that Select Committee, and to require that after a certain date all persons shall undergo an examination. (The noble lord here read the first clause of the Bill.) The second clause refers to a schedule, which sets forth the poisons or articles brought within the operation of the Act. It has been suggested that the Bill ought to be made very stringent; but I fear that there will be extreme difficulty in passing it through Parliament

if it should be made more stringent than it now stands. I am glad to see that my noble friend, the noble Duke the President of the Council, has placed some amendments on the paper which, I think, will be a great improvement to the working of this Bill. It is also proposed by a noble lord that, in the case of the sale of poisons, a certain bottle shall be used; but whether this amendment will meet with the approbation of Parliament is uncertain. The amendments having reference to the action of the Privy Council I cannot object to. With these few explanations, I hope the Bill will be allowed to pass through Committee.

Lord Vaux of Harrowden: I fully concur with my noble friend that this measure is a necessary one, and I trust your lordships will not object to extend its provisions to Ireland, where at present there are no chemists and druggists in the sense understood in England; for, in consequence of the severe examinations which the dispensers of medicines in that country have to undergo in Dublin, they will not, or do not, practise as chemists; and hence the great difficulty in getting a prescription made up in the small towns and villages in that country. I have been in communication with some medical practitioners in Dublin, and they have satisfied me that persons who are not apothecaries ought to be allowed to sell drugs, provided they undergo an examination. I hope there will be no objection to extend the operation of the Bill to Ireland.

Earl Granville: It appears that the qualifications required in Ireland for the dispensing of drugs are too high. However, so far as I am concerned, I shall have no objection to the extension of the Bill to that country.

The Duke of Marlborough: I do not wish to interfere with the discretion of the noble earl in making this Bill extend to Ireland, but I think that if the noble earl has any desire that the Bill shall pass through the other House, he will not accept the proposition to extend it to that country. I have no objection to the Bill going into committee. It is a Bill of very great importance, and that is shown by the Report of the Medical Officer of the Privy Council, who states that in many small country towns drapery and all sorts of goods and wares are sold by the same traders, and that arrowroot, rice, oatmeal, and other things reach purchasers with a mixture of arsenic, and that it was in consequence of this sort of trading that a lamentable accident occurred at Bradford some years ago. I understand that my noble friend proposes to make use of the existing Pharmaceutical Society, who so ably conduct the examination of Pharmaceutical Chemists, and also to make use of the machinery of their Minor examinations in having a general examination of all the future chemists throughout the country. It will be recollected that the Pharmaceutical Society is at present a voluntary association. It may be very desirable that the examination conducted by the Society should be made general throughout the country. If, however, there was any other examining Society of a similar character in existence, it would be fair to consider the claims of that society before granting pre-eminence to the Pharmaceutical Society; but there is not another society occupying the place or position which the Pharmaceutical Society occupies; and as this Society does occupy this high post, and they came forward in the public interest to ask that all persons trading in the sale of poisons shall undergo a fair examination, the Government have no objection that this power should be conferred upon the Society. But, at the same time, as these examinations are to made compulsory upon all persons who will hereafter practise as chemists and druggists, the Government are of opinion that it will be desirable that they shall have some control over the examinations; and consequently amendments are on the table providing that the Privy Council, which has a medical department, shall see that the examinations are conducted in a proper manner. Regulations will be made in reference to the sale of poisons, and these will be submitted to the Privy Council for approbation. I find that my noble friend has not placed in the schedule of poisons a poison most destructive to human life, *videlicet* opium. Now this article is much used by men and women, and largely given to infants; it is a very destructive poison, and I shall be glad to see it included in the schedule. With these observations, I agree with the measure generally.

Lord Redesdale: I wish to propose a clause that an angular bottle shall be used by all persons in the sale of poisons, and I cannot see that there will be any objection to my clause in committee. If there shall be, I will reserve my right to move it upon the report of the Bill, when perhaps a greater number of noble lords will be present. The reason why the clause is objected to by the Pharmaceutical Society is that all persons who may dispense poisons may not be able to obtain such a bottle, and, even if they can,

that persons in the country will not know the meaning of the use of it; but my opinion is, that when once it is enacted that such a bottle is used in the sale of poisons, it will become very generally known as the poison-bottle, and as being a very dangerous bottle. There is not one of your lordships who has not lost a friend or heard of an accident through the very incautious use of poison. Sometimes it may be in the dark, and sometimes through not knowing the contents of bottles in their possession; and the only way to guard against the evils arising from such incautious conduct is to have a particular form of bottle, which all persons will know when they lay hold of it as the poison-bottle.

The Lord Chancellor: The proposal of my noble friend to extend this Bill to Ireland is a most excellent one; but I fear this Bill will require much more amending than that of simply inserting at the end of the last clause the words "and Ireland."

The House then went into committee on the Bill.

Earl Granville: I should like, before agreeing to extend this Bill to Ireland, to consider the matter more fully; and I must therefore ask my noble friend to postpone his amendment till the report. I believe there is some doubt whether the Privy Council of England can make Orders which shall apply to Ireland, and this Bill requires that certain Orders shall be made by the Privy Council. I do not object to the amendments proposed by my noble friend the President of the Council.

The Duke of Marlborough: The Bill reserves the rights of wholesale dealers in supplying persons in the ordinary course of business, and also the rights of persons retailing arsenic and other things for use in manufacturing and photography. Now I propose to leave out the words in clause 16, "nor with the retailing of arsenic, oxalic acid, cyanide of potassium, or corrosive sublimate, for use in manufactures or photography." It has been suggested that the word photography should be left out, on the ground that photography is a manufacture, and will be included in that term. The object of this Bill is to exclude small traders and persons incompetent from selling poisons; and it will be one of the easiest things possible for persons to say they are keeping certain poisons for the use of photographers, if the word be retained in the Bill.

Earl Granville: I will not press my objections, but will consent that the sale of these things be confined to wholesale dealers. It seems hard upon those of this generation that vendors of poisons now in business as chemists and druggists should not be examined as to their competency, but I suppose that we must submit to that.

The Marquis of Clanricarde: I beg to express my concurrence in what has fallen from the noble lord as to the desirability of extending the operation of this very useful measure to Ireland.

The Duke of Marlborough: I must ask my noble friend who has charge of the Bill to consider the case of opium, which is not at present in the schedule, before the amendments are reported. I am informed by those who understand such matters, that there must be a separate Bill for Ireland.

Tuesday, June 16th, 1868.

On the bringing up of the Report,

Lord Redesdale said, I have to propose a clause which refers to a particular bottle in regard to the sale of poisons. Your lordships must be aware that a number of lives have been lost through the taking of poison under the supposition that it was the draught ordered by the doctor. Now one of the best guards against these unfortunate accidents will be an enactment, that poison shall be sold in bottles so well known that if laid hold of in the dark by any persons the contents will be understood, and that consequently poison will not be administered carelessly. The Chairman or President of the Pharmaceutical Society has been with me to-day, and we have had some conversation upon the subject of the two bottles which my noble friend opposite brought with him last evening, and it has been suggested that the Pharmaceutical Society shall have a month's time, after the passing of this Bill, to select a bottle of such a shape as may be thought most desirable, and which shall be described in the Bill. It has been pointed out, that a certain bottle which has been registered, which must lie down, and which will not stand upright, will be the sort of bottle that ought to be used. I think the bottle selected ought to be described in the Bill, and be called the poison-bottle. If it be described in the Act of Parliament it will soon become generally known as the pharmaceutical poison-bottle throughout the country. This will be a most desirable arrange-

ment, and the clause can be added to the Bill now, or during the further progress of it through Parliament.

The Lord Chancellor: I wish to point out to my noble friend that there are many poisons not sold in bottles, such, for instance, as strychnine, which is sold in very small quantities, and for various purposes, and both separately and compounded. The clause in the Bill refers to certain poisons, and some of the poisons mentioned cannot be put into small bottles; some poisons are carried in quills. I feel sure that great difficulties will occur in the operation of this clause if it be inserted in the Bill. In the preparation of medicines some ingredients are poisonous, which, when compounded, are not only not dangerous, but are beneficial to the human system, and yet the sale of these poisons, not in the prescribed bottle, will lead to an infringement of the law; and, again, if there can be no sale of any poison in compound, except in the poison-bottle, injury may be suffered by some persons.

The Marquis of Salisbury: I must appeal to the noble lord not to press this clause in its present shape. If it be absolutely necessary to have a certain form of bottle, it is not for Parliament to describe what it shall be, but to leave that matter to another body. I see the noble lord has minutely described the sort of bottle he wishes to be used, and he says it ought to be "corrugated," but what that word has to do with bottles I do not know. It may have something to do with iron. I think "fluted" will be a more appropriate term to apply to bottles. Then the noble lord says the bottles ought to be opaque. [Lord Redesdale. No; I have altered that.] Then, perhaps, it will be better if the clause be further altered, for I find amongst the list of poisons in the Schedule "cantharides" are mentioned as a poison to be sold in bottles; but how they will be got into small bottles it is very difficult to tell. As the matter stands, I fear we shall get into some absurdities. I do not think we ought to legislate in this way. It will be far better to leave the selection of a bottle, or to leave the matter with the Board of Trade, or the Privy Council, and let them say what sort of bottle ought to be used. If a certain bottle be described in the Bill it may cause a serious restraint on trade, and though not quite prevent the sale of poison yet do a great deal of harm; indeed, more harm than good.

Lord Northbrook: I object to this proposed clause, though I think that a regulation that bottles of a certain shape shall be used may, in some cases, be advantageous. But this Bill does not refer to or include all poisons which are traded in. Some of the poisons mentioned in the Schedule may be put into, and sold in bottles, but others cannot be sold in bottles. If it shall be enacted that poison shall be so sold in bottles of a certain shape, and they cannot be so sold, the people will be misled, and injury may result. I do not find that opium is mentioned in, or noticed in this Bill, and therefore laudanum need not, as the Bill stands, be sold in these particular bottles. If great care be not taken in framing this clause, the people may be led into danger.

Lord Redesdale: With regard to the objections of the Lord Chancellor and the noble marquis, I think they can be easily met. I feel strongly that poisons ought not to be sold in any sort of bottles, but that they shall be sold in bottles of a particular shape. I will remind your lordships that clause 19 of the Bill makes it unlawful to sell poisons in any box, bottle, and so forth, without being distinctly labelled with the name of the article, and consequently the objection of the noble lord who last spoke may have been overcome. The noble lord may raise objections to particular wrappers and boxes, but I confess I cannot see that there is any sound objection against describing a particular bottle in an Act of Parliament. It is suggested that this matter should be left to the Board of Trade, or be settled by the Privy Council, but how can either body make the thing so generally known in the 'Gazette,' as can be done by an Act of Parliament which is read throughout the country. There can be no better way of publishing any regulation than through an Act of Parliament. Under these circumstances, I must press the clause upon your lordships, because I think something ought to be done in this respect for the purpose of providing an additional protection to human life. In regard to bottles, if there be no description of any particular shape in the Bill, it will be some time before it can be generally known, but, on the other hand, if it be enacted that a certain bottle shall be used, and be known hereafter as the poison-bottle, it will be a piece of information soon spread throughout the country, and I believe that many most distressing accidents through the sale and use of poisons will be avoided.

The Lord Chancellor: I will suggest to my noble friend that all poisons, whether

to be sold in bottles or not, need not at present be mentioned in the Bill, for the second clause enacts that other poisons may be placed in the Schedule by resolution, and then that this addition shall become law after a publication in the 'Gazette;' and that will be the only way of making these poisons generally known in the country. Now it may meet the views of my noble friend if there be a provision in the Bill, that the shape of the bottle be left to the determination of the Pharmaceutical Society; afterwards to be approved of by the Privy Council; and afterwards that these resolutions shall be inserted in the 'Gazette,' and that the bottle ordered to be used shall be known as the poison-bottle. This, I think, will be sufficient information to the public, and it will become, I feel sure, very generally known throughout the country.

Earl Granville: I quite concur in the view, that an enactment in an Act of Parliament is the best way of causing anything to be generally known in the country; but perhaps we can agree upon a clause providing that the Pharmaceutical Society shall determine what shaped bottle shall be used.

Lord Redesdale: My objection is, that there will not be sufficient notice unless we insert a clause in the Bill. That is the only way of making a thing known all over the country. The same objection may be raised to the second clause. Why leave the poisons there mentioned to be published in the 'Gazette'? Then again, it may be objected that certain poisons shall be sold in boxes. My great object is, that there shall be an article known as the poison-bottle, and the insertion of a clause in the Bill is by far the best way of attaining this end. I have known of the loss of lives under most distressing circumstances, which, if there had been in any Act of Parliament a provision of this sort, might have been prevented. The noble marquis has objected to the term "corrugated," and as there may be something in the objection, I will consent to insert "fluted" instead of "corrugated," but with this amendment in the clause, I must divide the House, if necessary.

The Earl of Malmesbury: Are we seriously to divide upon the shape of a bottle?

Earl Granville: I would suggest that we should have a little more time to consider this question of a bottle's shape.

Lord Redesdale: If it be thought more desirable that I should propose my clause upon the third reading, I have, considering the discussion which has taken place, no objection. I will, under the circumstances, have the clause reprinted, and propose it upon the third reading, and I hope, in the meantime, my noble friends will seriously consider this matter. If they will do so, they will see that there is no valid objection to inserting this clause in the Bill.

Thursday, June 18th, 1868.

On the motion that the Bill be read a third time,

Lord Redesdale said, I now move the introduction of the clause of which I have given notice, and which will secure for the protection of the public the use of one uniform bottle for holding poisons, to be called "The Poison Bottle." Its introduction may be gradual, but in course of time it will come to be recognized by all. I originally suggested the adoption of a particular bottle, but on reflection I have no objection to leave the matter to the decision of the Privy Council and of the Pharmaceutical Society. I believe that there is no objection to the introduction of this clause, which I feel confident will tend in practice to the prevention of very serious danger.

The Marquis of Salisbury: I must oppose this clause, on the ground that the noble lord has failed to answer the objection raised on a former occasion by the noble and learned lord on the woolsack,—that many of the poisons which are proposed to be put into these special bottles are poisons entering into the almost daily prescriptions of physicians.

Lord Redesdale: The noble marquis is mistaken. The only poisons with regard to which my clause will enforce the use of a special bottle are those which by the previous clause are required to be labelled as poisons.

The Marquis of Salisbury: One so well versed in the rules of the House as the noble lord, must see that there is great inconvenience in discussing a totally new provision, of which no notice whatever has been given. The distinction taken by the noble lord, it will be seen on examination, is not well founded, for the earlier clause provides that no person shall sell any poison, wholesale or retail, unless in a wrapper distinctly labelled. A letter in the 'Times' recently has given the names of some of the drugs

in constant use, such as arsenic, prussic acid, strychnine, all poisonous vegetable alkaloids and their salts, aconite, corrosive sublimate, belladonna, and cantharides; every one of these drugs enter into the prescriptions of physicians, and are used sometimes in cases of great emergency. A physician in some urgent case may send to a chemist, in whose possession he knows the particular drug to be, and yet that chemist, merely from the fact that his stock of this particular poison-bottle happens to be exhausted, will be absolutely prevented from supplying the medicine. The bottle also may be patented as being the invention of some particular person.

Lord Redesdale: It is not a patent.

The Marquis of Salisbury: Well, then, it may be registered.

Lord Redesdale: I have expresssed my willingness already to leave the shape of the bottle to be settled by the Privy Council and the Pharmaceutical Society.

The Marquis of Salisbury: But there is great inconvenience in introducing extensive additions of this kind upon the mere discussion of some particular clause of a Bill, and that too without notice. Apart from the practical objection that a particular medicine sent for in great haste in the middle of the night may fail to be procured in the absence of the poison-bottle, I object to the whole principle of the proposed legislation on this point. Hitherto we have proceeded upon the principle of protecting persons from wrongs or injuries wilfully wrought by others, but we have never acted upon the principle of protecting sensible people from possible dangers merely because foolish people may have it in their power to injure themselves. Because somebody may be foolish enough to get up in the middle of the night, and, without taking the trouble to strike a light, may drink off the contents of a bottle, therefore the noble lord proposes to introduce entirely new restraints affecting a whole profession. This is a principle of legislature not unknown to foreign countries, where governments are very fond of protecting people against the consequences of their own acts, but it is totally opposed to the habits of this country, its direct tendency being to hinder the general business of mankind. The principle is one that if adopted in this country will tend, I feel sure, to greater evils than those which it seeks to prevent.

Earl Granville: I think that the clause framed by the noble lord may be modified with advantage before it is submitted to the House. On this subject I have received a letter from a gentleman of much practical experience, and I will read it to the House. He says, "I find that Lord Redesdale retains his faith in the poison-bottle, and intends to propose it again on the third reading of the 'Pharmacy Bill,' adopting that which I certainly believe to be by far the most distinctive bottle ever used. But the more I consider his lordship's proposition and the more I think of the value pertaining to special bottles of any shape when used according to the discretion of dispensers who understand their business, the more impressed I become with the impolicy of specific enactments concerning them. I have already told your lordship that most chemists in London use distinctive bottles for dangerous articles and external applications; they have done so for the last six or seven years, the practice gradually increasing. I have also said that the use of these bottles should be restricted to such articles. Now, I presume the words 'poison' and 'poisonous' in the proposed clause must be construed according to clause 2. If so, we should be prohibited from using such bottles for every medicine not in the schedule, and I need scarcely say the schedule does not contain a sixth part of the dangerous preparations daily passing through our hands. I should not think now of selling laudanum in any other than a poison-bottle; laudanum is not in the schedule, consequently I must, if the amendment pass, discontinue that precaution. I know Lord Redesdale thinks it is the inconvenience of the compulsory enactment which actuates the Pharmaceutical Society in resisting his proposal, but I can assure you most honestly that they are anxious, both by example and recommendation, to promote his views, and really apprehensive that his amendment would prevent their doing so." The noble lord was understood to say in conclusion, that if the clause was not complete it would be worse than no provision at all, and that it would resemble that very dangerous gun invented some years ago, which was provided with a complicated contrivance to prevent its going off.

The Duke of Marlborough: Although the clause has been greatly improved sincelast it was offered to your lordships, I think the disadvantages connected with the proposal outbalance the advantages. Provisions by which the Pharmaceutical Society has power, subject to approval by the Privy Council, to require dispensers to use poison-bottles will,

in my opinion, sufficiently answer all purposes. The proposal of my noble friend (Lord Redesdale) is defective, inasmuch as the schedule of poisons for which the bottles are to be used omits mention of many substances more harmful than those it contains, and the result will be, that poisonous liquids will be placed in ordinary bottles, and comparatively harmless liquids in poison-bottles. I would recommend my noble friend not to press the clause.

Lord Redesdale: It is difficult to know what to do, but the arguments offered against my proposal seem by no means conclusive. Respecting the statement of the noble marquis (Lord Salisbury) that it is contrary to English practice to make laws for the safety of those who are well able to take care of themselves, I would remind the House that many instances of such legislation already exist. Persons are every day being punished for stepping from a train in motion, and it is held to be no excuse that they know how to do so without danger. I think it will be better to insert the clause that it may be fairly discussed in the House of Commons.

The Earl of Kimberley: Chemists are of opinion that security will not be gained if the use of the bottle be insisted on. I have received a letter from a chemist in proof; it is to the effect that a case may arise in which diluted prussic acid will be dispensed for internal doses of a spoonful each, in company with a highly poisonous lotion of belladonna; both will be dispensed in poison-bottles, and no security will be had that the lotion will not be taken for the diluted acid. My correspondent hopes that your lordships will not adopt the clause unless you wish to be killed by Act of Parliament.

The Earl of Airlie: I cannot vote for this proposed clause, as it will clash in operation with clauses already inserted in the Bill, as, for instance, with clauses 16 and 17. I certainly am of opinion that under all the circumstances it will be far better to leave this clause out.

After a few words from Lord Stanley of Alderley across the table,

Their lordships divided on the question that the clause be added to the Bill, and there appeared—

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The clause was consequently rejected.

The Marquis of Clanricarde: I have to express a hope that the provisions of this Bill will next session be embodied in another Bill, to be made applicable to Ireland.

The motion that the Bill do pass was then agreed to.

THE PRESENT STATE OF PHARMACY IN IRELAND.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—I beg to draw attention to the present backward state of pharmacy in Ireland and the cause of the same.

The law, as administered at present in this country, strictly prohibits any person from opening a shop for the compounding of physicians' prescriptions, unless he be a Licentiate of the Apothecaries' Hall, Dublin. Even a qualified "pharmaceutical chemist" cannot legally make up a prescription; if he does, the Apothecaries' Company will be sure to spring upon him and take legal proceedings against him for thus trespassing on their property. Now that we have a national pharmacopœia, whereby the name, preparation, and strength of every medicine should be the same throughout the United Kingdom, I see no satisfactory reason why a person who practises pharmacy in England cannot carry on the same profession in this country without let or hindrance.

But the Irish apothecary is something more than a pure pharmacien, because "the licence of the Apothecaries' Hall, Dublin, entitles its possessor to be registered as a medical practitioner under the 'Medical Act, 1815,' and to practise medicine and pharmacy in any part of her Majesty's dominions." If a L.A.H. and an M.D. are the only two medical men that reside in a small coun-

try town in Ireland, the apothecary can refuse to compound the doctor's prescription by saying he has not the medicines in stock, or by charging an enormous price for them, and he can prevent any duly qualified "pharmaceutical chemist" from so doing, who is generally more competent for the task. Surely this state of things requires immediate rectification, for, if allowed to continue much longer, it will soon end in a monopoly of prescribing as well as dispensing.

I am certain the extension of the new Pharmacy Act to Ireland would tend greatly towards developing the natural resources of our country, and do it a vast amount of good in every way. Resting assured that this hint may stimulate the proper individuals towards doing pharmacy justice in Ireland,

I am, Gentlemen, your obedient servant,

THOMAS J. MONAGHAN.

A BILL TO AMEND THE "ACT FOR PREVENTING THE ADULTERATION OF ARTICLES OF FOOD OR DRINK, 1860," AND TO EXTEND ITS PROVISIONS TO DRUGS.

This Bill which was introduced in the House of Commons by Mr. Dixon, M.P., and read a second time on Tuesday, June 23rd, stands committed for Wednesday, July 8th. It contains clauses relating to the adulteration of drugs which should not be allowed to pass without receiving deliberate consideration from those whose interests would be seriously affected by the operation of such a law.

The following are the clauses to which we allude:—

1. Every person who shall admix, and every person who shall order any other person or persons to admix, with any article of food or drink any injurious or poisonous ingredient or material to adulterate the same for sale, and every person who shall admix, and every person who shall order any other person or persons to admix, any ingredient or material with any drug to adulterate the same for sale, shall, for the first offence, forfeit and pay a penalty not exceeding fifty pounds, together with the costs attending such conviction, and for the second offence shall be guilty of a misdemeanor, and be imprisoned for *six calendar months* with hard labour.

2. Every person who shall sell any article of food or drink with which, to the knowledge of such person, any ingredient or material injurious to the health of persons eating or drinking such article has been mixed, and every person who shall sell as pure and unadulterated any article of food or drink, or any drug which is adulterated or not pure, shall for every such offence, on a summary conviction of the same before two justices of the peace at petty sessions in England, and in Scotland before two justices of the peace in the justices of the peace court, or before the sheriff substitute of the county, or before justices at petty sessions or a divisional justice in Ireland, forfeit and pay a penalty not exceeding twenty pounds, together with such costs attending such conviction as to the said justices shall seem reasonable; and if any person so convicted shall afterwards commit the like offence, it shall be lawful for such justices of the peace to cause such offender's name, place of abode, and offence to be published at the expense of such offender, in such newspaper, or in such other manner as to the said justices shall seem desirable.

The Bill also proposes to make it compulsory for municipal, and other local authorities, to appoint salaried analysts by whom articles of food or drink, and also drugs, are to be analysed for small fixed fees.

DINNER TO MR. WATTS.

On the 15th instant a complimentary dinner was given at the Freemasons' Tavern to Mr. Henry Watts, F.R.S., by several of his friends and coadjutors, in celebration of the completion of his 'Dictionary of Chemistry.' The chair was taken by Dr. Odling, and there were also present Dr. Roscoe, Dr. Guthrie, Mr. Hanhart, Prof. Cary Foster, Dr. Atkinson, Mr. F. Field, Dr. H. Müller, Mr. David Forbes, Mr. A. P. Price, Dr. M. Foster,

Dr. Russell, Dr. Gilbert, Dr. Redwood, and some others. Mr. De la Rue, Dr. Frankland, Mr. Abel, and Mr. Greville Williams were unfortunately prevented from attending. In proposing the toast of the evening, the chairman remarked upon the advantages which accrued to chemists from their having compressed into five goodly volumes an accurate abstract of the immense mass of chemical knowledge which had gone on accumulating up to the present time, and he complimented Mr. Watts upon the thoroughness and conscientiousness with which this part of his labours had been performed—that he had not been content with giving crude abstracts of scarcely more crude material, but had produced a complete system of singularly well-digested abstracts, bearing upon them the stamp of his own individuality. The health of Mr. Watts was then drunk with much enthusiasm; other toasts followed, including "Success to the Messrs. Longmans," and the party broke up after an evening of much enjoyment.

SUICIDE OF A CHEMIST BY PRUSSIC ACID.

An inquest was held on June 2 by Mr. Emsley, the Leeds borough coroner, touching the death of Mr. Joseph Haigh, a chemist and druggist, who carried on business in Briggate, and resided at Woodbine Place, and who was found dead in his shop on Sunday morning. On Sunday morning last, the deceased, who was a well-known and much-respected tradesman, went to his shop, in accordance with his usual custom, between eleven and twelve o'clock, and soon after he had entered, a person called Mr. Joseph Hollins, of Farsley, who was looking for a chemist's shop in order that he might make a purchase, saw the door of his place of business open and went in. Upon passing the threshold he saw the deceased stretched upon the floor quite dead. An alarm was raised, and Mr. Nunneley, the surgeon, who happened to be passing at the time, went to the shop, but found that deceased was beyond the reach of medical skill. A bottle of prussic acid, and also a bottle containing strychnine, being found near to the place where the deceased lay, a suspicion was entertained that he had poisoned himself, and, in consequence, Mr. Nunneley made a *post-mortem* examination of the body. He found, as he stated at the inquest yesterday, that the cause of death had been a large dose of prussic acid, from which the deceased had died almost immediately after he had taken it. As to the reason for Mr. Haigh having taken the poison, Mr. Joseph Walker, the solicitor and personal friend of his, stated that for some time past he had laboured under the impression, to which he had upon more than one occasion given utterance, that his affairs were in an embarrassed state, and that he would soon be obliged to close his place of business. Mr. Walker also stated that from an examination into the books and papers of the deceased, he was able to say that there was no ground for this impression, and that it was a delusion.

Mr. Storr, of Upper Fountaine Street, an old friend of the deceased, stated that he had heard the same story from his lips, and that, believing it to be a delusion, he had endeavoured to convince him of that, but in vain. He had noticed for some time past that Mr. Haigh had appeared to him to be in a very excitable frame of insanity.

Upon this evidence the jury, acting under the direction of the coroner, returned a verdict to the effect, that the deceased had committed suicide by taking prussic acid whilst in a state of temporary insanity.

EXTRAORDINARY DEATH FROM POISON.

An inquiry was held on June 23rd by Mr. Richards, deputy coroner, at Sion House, Lower Clapton, relative to the death, from the inhalation of poison, of Mr. Capel Henry Berger, aged twenty-eight years.

Mr. C. Berrow Berger, Sion House, said that deceased lived with him, and was a colour manufacturer. He suffered for a fortnight past from a very severe toothache, but a dentist advised him to preserve the tooth and bear the pain. He was an accomplished chemist, and he tried all sorts of things to allay his sufferings. On Sunday, June 21, while at church he had to sit in a great draught, and that brought on a relapse of the pain. In the afternoon he went to his room, according to his custom, and bolted himself in, for the purpose of spending some time in devotion. When his sister called him down to tea she could not make him hear, and ultimately witness broke open the door, and

found him lying dead on the floor upon some flexible tubing which communicated with a bottle of carbolic acid. His face was quite black, and he had vomited. It was clear that he had died from the carbolic acid, but he had not committed suicide.

Dr. J. B. Metcalf said that deceased had fixed an elastic tube, ten feet long, to a large glass jar of carbolic acid, and had then evidently seated himself in a chair, and had inserted the end of the tube in his mouth, for the purpose of allowing a drop of the liquid to fall on the tooth. He had a brass regulator on the tube to control the quantity of the acid, but it did not act efficiently, and the volatile poison overcame him, and he became giddy and fell. Being alone in the room, the poison continued flowing into his mouth, and the heart's action was stopped, and he died. The remedy which he tried was a new one, and the deceased was in the habit of recommending it to his friends. It should never be used without medical assistance. The jury returned a verdict of "Accidental death, from inhaling carbolic acid as a cure for the toothache."—*Express*, *June* 24.

ACTION AGAINST A DRUGGIST FOR SELLING POISON FOR MEDICINE.

The following extract from the 'New York Times' may be interesting to the readers of this Journal.

Mr. P. W. Bedford is a pharmaceutist of high standing in New York, and is the Corresponding Secretary of the American Pharmaceutical Association.

Two years since Mr. Bedford sold the woman Jane Arnold some senna leaves, which she shortly after alleged were some poisonous drug and not senna. From that time he was subjected to most annoying persecution, for the purpose of extorting money from him, which at length culminated in an action, which was settled in favour of the defendant. It is difficult to guess what poisonous leaves could by any possibility have been substituted for senna without immediate detection.

"*Jane Arnold* v. *P. W. Bedford.*—This action was brought to recover $1000 damages for injuries sustained by plaintiff in consequence of taking medicine sold by defendant, a druggist, doing business at No. 745, Sixth Avenue, in January, 1866. It appears from the testimony of plaintiff, who is a seamstress, that on the 28th of January, 1866, she sent her boy to defendant's drug store for some senna to give to her sick daughter; a package labelled 'senna' was given to the boy, and a portion of it was steeped in water and given to the girl, who was immediately seized with vomiting; a sample of the medicine was shown to plaintiff's physician the next morning, who tasted it, and remarked that it produced a curious sensation upon his throat, and advised plaintiff not to use any more of it. Previous to this, however, plaintiff had eaten two or three leaves of the medicine, and she alleges that it produced serious injuries to her health, from which she has not yet recovered.

"The defence admitted having sold the medicine as charged, but denied that it was poison, or that the evil results, if any, arose from the senna sold by defendant. It was claimed that the charge of poisoning was bogus, and that the suit was instituted for blackmailing and speculative purposes. The senna, it appears, was never analysed, but was given to a physician, who also has mislaid it, and it cannot be found."

After a protracted trial, the jury rendered a verdict for the defendant.

Obituary.

NATHANIEL BAGSHAW WARD, F.R.S.

We regret having to record the decease of another of our great and good men, Nathaniel Bagshaw Ward, of "The Ferns," Clapham Rise, who died on the fourth day of this month (June), in the seventy-seventh year of his age.

Mr. Ward was chiefly known to the public as the inventor of glass cases for the growth of plants. Among his more intimate friends he was equally well known for his genial and amiable disposition, and his intense love of plants.

He was born at Plaistow, in the year 1791. His father was for many years in practice as a medical practitioner, at Plaistow, in Essex, where much of the early life of Mr. Ward was spent. His pursuit of botany at that time was characterised by

great energy and perseverance. He would be up and away at two or three o'clock in the morning, and walk many miles before daylight to his botanising grounds, fill his vasculum, and get back by midday to dispense the medicines ordered that morning for his father's patients, and then proceed to lay out and dry his plants. Such energy could not but be rewarded with perfect success, and lay the foundation for that honourable and useful career which marked his whole life.

He was subsequently in practice on his own account in Wellclose Square, where he made the discovery which led to the adoption of close glazed cases for the transmission of plants from one part of the world to another, and which have not only been the means of enriching our conservatories with the choicest productions of nature, but of introducing tea-plants for cultivation into Assam and the cinchonas into India, either of which facts is sufficient to immortalise his name as a great benefactor to his race.

It was in Wellclose Square also where those delightful evening parties met in the pursuit of microscopic science, which afterwards led to the formation of the Microscopical Society of London, and of which he was for many years the treasurer.

He was a good classical scholar, and had a wonderful memory for words,—retained to the last,—which no doubt greatly facilitated his acquirement of a very extensive knowledge of plants. His garden at Clapham Rise, where he had resided for many years, was not one to attract ordinary flower-growers, it being in the eyes of most a mere wilderness; but to himself it was a constant source of the greatest enjoyment, which he took care that all and every one, rich or poor, should participate in if they pleased. It was crowded with rare hardy plants from both the Old and New World. His knowledge of their habits and economic value was very extensive, and nothing delighted him more than to get a friend or two with him and talk about them, interspersing his descriptions with remarkable anecdotes of great men and botanists whose names were in some way connected with his pets.

Mr. Ward was a very old member of the Apothecaries' Company, to which he served the office of master, and for the last few years of his life was its honoured and esteemed treasurer.

Although in no special manner connected with pharmacy, except in the pursuit of his favourite science, botany, we can hardly allow the name of so great and good a man to pass without a record, however imperfect, in our Journal. And it may be well that our members should know that, in his own quiet way, he was one of the staunchest friends of the Pharmaceutical Society.

To this sketch of the life of Mr. Ward, which has been contributed by an old friend, we add the following remarks from the pen of Dr. Hooker, and published in the 'Gardeners' Chronicle':—

"Mr. Ward, whom I knew for full thirty years of my life, was as warm and steady a friend as I ever possessed; and it would be difficult to say which of the many excellent traits of his estimable character was most worthy of imitation—his love of truth, or his appreciation in others of generous qualities far inferior to his own; his unselfish regard for the happiness of those around him; or the absence of all vanity, littleness, and self-love; or his eager desire to promote the worthy aspirations of the young, and administer to the failing faculties of the old. He sought the acquaintance of youths, especially for the purpose of fostering the tastes of those who took to natural history, and instilling the love of nature into those who did not, with the one object in both cases of rendering their lives the happier thereby; and he extended the same solicitude to the poorest of the poor with a zeal and singleness of purpose which would have appeared morbid in a man of less cultivated tastes or less scientific acquirements. For the welfare of young travellers and voyagers he had especial regard, and of these none whom he knew went forth in the wide world without some token of his affectionate interest in their career, in the shape of a book, a pocket lens, or some useful implement for study or collecting, always of the very best possible make, and by the best possible maker. With those that would, he kept up a correspondence, which in my own case was, I avow, the most useful and pleasant I ever enjoyed; his letters, written in a small and beautiful running hand, contained, besides the scientific gossip of the day, information of all kinds that he thought could interest or be valuable to the traveller, together with good manly counsel, and a hearty interest in the recipient's success, which is the best stimulus to work, and the best cheer under circumstances of difficulty and danger.

"During the whole period that I knew him, and I believe for many years before, his

hospitable house, first in Wellclose Square, and latterly at Clapham Rise, was the most frequented metropolitan resort of naturalists from all quarters of the globe of any since Sir Joseph Banks's day. His unpretending entertainments were frequent, for many years periodic, and often weekly. On these occasions his many scientific friends flocked to see himself, his live plants, and the specimens, instruments, and preparations he had collected to entertain and instruct them; and on such occasions it was that many a country and colonial naturalist was introduced for the first, and too often the last time in his life, to some of the most eminent naturalists of Europe.

"Of the value of that contrivance, which justly bears his name, the Ward's case, it is impossible to speak too strongly; and I feel safe in saying that a large proportion of the most valuable economic and other tropical plants now cultivated in England would, but for these cases, not yet have been introduced. It is true that cases similar to his were previously in use, and I well remember such, fitted with panes of talc or mother-of-pearl, being sent by Wallich from Calcutta to England many years ago, but these were used rather as sun-shades, and protections against rain and salt water, than as Ward's cases are; and the principles upon which cases for the transport of living plants should be constructed, and the *rationale* of the treatment which the plants in them should receive, were alike the fruits of Mr. Ward's scientific knowledge, and were both developed and put in practice by him. Of even more consequence than this was his application of these cases to the purposes of town gardening, whereby he has afforded to the denizens of this Metropolis, old and young, rich and poor, far greater, higher, and purer pleasures than all artists, house-decorators, furniture-makers, and cockney dealers put together have contributed; for a primrose placed in flower at Christmas under a bell-glass in a London drawing-room will charm when a Raphael does not, and charm none the less when a Raphael charms also.

"In the memory of those that knew him, Mr. Ward will live as a type of a genial, upright, and most amiable man, an accomplished practitioner, and an enthusiastic lover of nature in all its aspects."

ODDEN HAMBROOK.

On the 8th inst., after a few days' illness, Mr. Odden Hambrook, chemist, Dover, in the eighty-fourth year of his age, universally respected.

Never was more truthful comment on departed worth. Commencing business some sixty years ago, when the only vendor of medicine in Dover was an old woman, a chemist's shop was a novelty. The first day's receipts amounted to one penny, the second day the amount rose to three-halfpence,—"encouraging! (thought the young chemist), here is an advance of 50 per cent." Next day, however, fell off to nothing. Notwithstanding these small beginnings, this father of the trade in the ancient town and port of Dover lived to see upwards of thirty chemists' shops flourish around him.

The life of Odden Hambrook was one of remarkable activity. United with no ordinary share of benevolence,—as any one might judge who regarded that elevated coronal development, and the beaming countenance of its possessor,—so much confidence was placed in the discretion and good feeling of our respected friend, that many wealthy persons were accustomed to entrust him with large sums of money, to be distributed, according to his judgment, among the deserving, necessitous poor, and he kept a regular ledger account of moneys received and expended, with a marginal commentary on every case. Up to a very recent period Mr. Hambrook had attended to business, remarking only a short time since to the writer of this notice, "Nothing pleases me better than to be usefully employed as long as I am able."

In religious principles Mr. Hambrook was a Wesleyan, and for many years exercised his talent as local preacher; in politics, a moderate conservative; in habits, eminently one of the old school. He was averse to increasing the number of chemists, and took very few apprentices, most of whom he survived. His nephew, Mr. John Mummery, dentist, was one of his pupils, but left the business many years since for the more lucrative profession.

In taking leave of Mr. Hambrook, one feels that another link connecting the past with the present is severed. His company was always agreeable, and his discourse instructive. Let us hope that the young men of the present day will earn for themselves as good and enduring a fame.

MISCELLANEA.

Pyrethrum Roseum, a Remedy for Insect-bites.—A well-known German traveller, F. Jager, in his 'Sketches of Travels in Singapore, Malacca, Java' (Berlin, 1866), describes the powder of the *Pyrethrum roseum* as a specific against all noxious insects, including the troublesome mosquitoes and those which attack collections. He says, "A tincture prepared by macerating one part of the *Pyrethrum roseum* in four parts of dilute alcohol, and, when diluted with ten times its bulk of water, applied to any part of the body, gives perfect security against all vermin. I often passed the night in my boat on the ill-reputed rivers of Siam without any other cover, even without the netting, and experienced not the slightest inconvenience. The 'buzzing,' at other times so great a disturber of sleep, becomes a harmless tune, and, in the feeling of security, a real cradle-song. In the chase, moistening the beard and hands protects the hunter against flies for at least twelve hours, even in spite of the largely increased transpiration due to the climate. Especially interesting is its action on that plague of all tropical countries, the countless ants. Before the windows, and surrounding the whole house where I lived at Albay, on Luzon, was fastened a board six inches in width, on which long caravans of ants were constantly moving in all directions, making it appear an almost uniformly black surface. A track of the powder several inches in width, strewed across the board, or some tincture sprinkled over it, proved an insurmountable barrier to these processions. The first who halted before it were pushed on by the crowds behind them; but, immediately on passing over, showed symptoms of narcosis, and died in a minute or two; and within a short time the rest left the house altogether."—*British Medical Journal, May* 30, 1868.

Explosion of Nitro-glycerine.—We learn from the public papers that another explosion of this dangerous agent has occurred. A nitro-glycerine manufactory exploded at Stockholm, by which fifteen persons were killed, and great destruction of property caused.

Separation of the Solid Matter from Sewage.—Mr. Robert G. Sillar, 'Times,' April 16th, suggests that the solid matter may easily be precipitated from sewage by pouring in a solution of common alum; and observes, that the muddy waters of the Woosung river in China are always purified in this way for household use, and that the same process might advantageously be applied to the sewage of any town, allowing the liquid portion to pass into the river, and the solid to be available for manure.

We learn from the 'Lancet,' June 13, that a similar method has been tried by the Tottenham Board of Health for the same purpose. The plan adopted was that of M. Lenk, of Dresden, for the purification of water, which consists in the application of a solution containing alum, aluminate, carbonate of soda, and iron, or hyper-manganate of potash. 26,000 gallons of the liquid sewage was conducted into a large tank, 50 feet long by 20 feet wide, and to this was added 60 gallons of M. Lenk's solution. The odour gradually decreased, and those who were present at the experiment state that in a little while a remarkable change was apparent. The solids were precipitated, whilst the supernatant water gradually became transparent, and in an hour was almost clear.

BOOKS RECEIVED.

Principles of Forensic Medicine. By William A. Guy, M.B., F.R.S., etc. Third Edition, revised, enlarged, and copiously illustrated by wood engravings. London: Henry Renshaw, 356, Strand. 1868.

On the Pathology of the so-called Eczema Marginatum, and of Sycosis. By Dr. M'Call Anderson. Edinburgh: Printed by Oliver and Boyd. 1868.

The Canadian Pharmaceutical Journal. Vol. I., No. 1. Toronto, May, 1868.

TO CORRESPONDENTS.

Persons having seceded from the Society may be restored to their former status on payment of arrears of subscription and the registration fee of the current year.

Those who were Associates before the 1st of July, 1842, are privileged (as Founders of the Society) to become Members without examination.

The General Index to the first fifteen volumes of the Pharmaceutical Journal may be had of the Secretary, price 2*s.* 8*d.*, or bound in cloth, lettered, 3*s.* 8*d.*, post free.

The Catalogue of the Library may also be had of the Secretary, price 1*s.* 1*d.* post free.

The Decimal System.—I beg to inquire of your correspondent of last month, who approves of the decimal system of computation, how he would represent the value of any one of the following articles:—Three loaves bought for a decimal shilling, twelve bottles of wine bought for forty decimal shillings, or three horses bought for a hundred decimal pounds? The fact is, that this system is absolutely unable to express the exact value of any one of these, and only the approximate value by much torturing and many figures. Further, it can only give the value of tenths and fifths (and of course halves) in whole figures, quantities that, by the experience of ages, are rarely required. —Robert Howden.

J. T. L. (Bristol).—A little conserve of hips, or manna, will answer the purpose.

J. H. W. (St. Alban's) wishes to know what are the medicinal properties of *Nitrate of Furfurine.*

"*Speculum*" (Stroudwater).—Rub down the gallic acid, which is sparingly soluble, with the dilute sulphuric acid and a little of the decoction, then add the other ingredients. The copious precipitate observed in the mixture cannot be avoided.

T. A. N.—(1.) *Remedy for Cholera ordered by the Board of Health*, see Vol. VIII (N.S.) pp. 85 and 170. (2.) Dr. Attfield's 'Pharmaceutical Chemistry.'

J. T. T. (Richmond, Yorkshire).—*Glycerine Jelly.* Vol. XVII. p. 400.

T. E. (Salford).—(1.) No. (2.) Yes.

"*Junior*" (West Bromwich).—No.

J. B. P. (Wakefield).—The specimen arrived much injured, but it appears to be young state of *Filago germanica.*

B. Y. (Bristol).—A new edition is preparing and may be expected to appear about January.

R. S. (Crosby).—The cubical crystals you find on extract of stramonium are chloride of potassium.

Botanist (Lincoln).—In January next.

"*Iota*" (Perth).—(1.) It matters little as to the order in which the ingredients are put together, as in any case the quinia will be thrown out. (2.) We presume that a solution in rectified spirit is required; and when this is not the case a formula for an aqueous solution is given in the same work.

"*Santonica*" (Macclesfield).—Santonine is generally given in doses of from 2 to 4 grains, either in powder or in the form of lozenge.

W. J. D. (Portsea).—Yes; but the label forwarded would render you liable to the Patent Medicine Duty.

W. L.—(1.) We know of no published formula for *Liq. Potassæ Hypophosphitis.* The strength of Taylor's solution is ʒi of the dry salt in ʒiv of solution. (2.) *Tincture of Virginian Prune*, Vol. V. (New Series), page 105.

Substance for Lighting Cigars by Blowing.—Mr. Hunter (Glasgow) sends the following formula in reply to F. G. (Devizes) in our April number:—

"℞ Plumbi Acet. ʒij; Acid Tart. ʒiv. Dissolve these powders separately in distilled water. Mix the two solutions, collect the precipitate, and when dry put it into a bottle, which is to be introduced into a crucible filled with sand, and exposed to a red-heat until the bluish vapour at the mouth of the bottle is no longer visible, when a light is applied. It is then taken off and allowed to cool, and kept in a well-corked bottle. It is used by applying it to the point of a cigar, which is drawn briskly through the air." We would recommend caution in the use of this substance.

Mr. G. Shepperley (Nottingham) is thanked for his communication.

W. L. G. (St. Austell).—About ʒss of acetic acid, B.P.

Several articles are unavoidably postponed.

Erratum.—In the list of Exhibitors at the Conversazione, p. 553, *for* G. Dunmore *read* Edward Dunmore.

Instructions from Members and Associates respecting the transmission of the Journal before the 25th of the month, to Elias Bremridge, Secretary, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Messrs. Churchill, New Burlington Street. Other communications to the Editors, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. X.—No. II.—AUGUST, 1868.

THE SALE OF POISONS AND EXTENSION OF PHARMACY ACT.

The Pharmacy Bill, which has now passed both Houses of Parliament, has attracted a considerable amount of attention. As to real opponents in either house, it is, perhaps, scarcely too much to say that none have appeared. On the one hand, no peer or member of the House of Commons has attempted to deny that the sale and dispensing of poisonss hould be entrusted only to men educated specially to fit them for such an avocation; while, on the other, no one has been prevailed on to take up the cry of alarm raised by a certain grade of the medical profession, lest the chemists who are to be examined and certified as to their trustworthiness to compound poisons should assume to themselves, and the public should deem them to possess as a consequence of that examination and certificate, a right and ability to step beyond their legitimate calling, and trespass on the province of the medical practitioner. We will say no more about this unnecessary alarm than to deprecate, as we have ever most strongly done in this Journal, the unjustifiable assumption of medical practice by unqualified men, and to assert our firm belief that the whole tendency of the Pharmaceutical Society has been in an opposite direction. A pharmaceutist may find dignity and profit enough in his own profession to satisfy his aspirations and wants, notwithstanding the upward tendency of society in all its classes. It would have been strange indeed if any man had had the temerity to propose in the House of Commons that, rather than a chemist should be led to regard himself as a doctor, he should be encouraged—nay, almost compelled—to remain unfitted for his own duties. Or, even going a little further, in the present age, when the Legislature is urged to protect the public against the baneful effect of ineradicable vices, to say that, seeing people are addicted to the popular indiscretion of consulting chemists in cases of belly-ache, the wise course for a paternal government to pursue would be to keep those chemists in a state of ignorance.

Happily, Parliament does not legislate in this wise. There are enlightened senators sitting at Westminster who weigh *possible* evil against *probable* good; and on the present occasion the possible evil has kicked the beam when poised against probable good thrown into a scale already loaded with evil of proved existence. In truth, the weight of existing evil has been so great that it has made some men unwisely energetic in their efforts to eradicate it; and the promoters of the Pharmacy Bill have had more to fear from their friends than their foes. The Pharmaceutical Society had many things to consider in framing their Bill, so to give each interest place that none should be lost sight of nor sacrificed, and yet that the ultimate object of legislation should be attained.

Men less acquainted with these opposing interests, and with the details of the trade of chemists and druggists, were puzzled to realize all these difficulties, and for that reason the Pharmacy Act of 1868 will strike some of our readers as being less liberal than the Bill discussed from time to time in this Journal. Those who have had to fight the battle inch by inch, advocating vested interests and expediency, can alone know the determination which had to be encountered in the work.

In the first clause of the Bill an alteration was made whereby all existing chemists who choose to continue the sale and compounding of poisons *must* submit to registration. This is undoubtedly right in principle, although contrary to the resolution of the Committee of the House of Commons which sat in 1865. It is, however, so guarded in clause 5, that all who apply for registration *before* the 1st of January, 1869, may secure it *without payment of any fee*, so that the hardship is very small, if any, compared to the advantage which will be secured thereby. We feel it our duty to draw attention to the time at which this registration *without fee* will cease.

Again, in the fourth clause, under which apprentices and assistants were to have been admitted to the roll of chemists and druggists, the promoters of the Bill were given to understand by the party represented in the House by no less able an advocate than Mr. Lowe, that if such a provision remained the Bill itself should be opposed at every stage; and a notice was given by Mr. Lowe to expunge the clause entirely. To meet this difficulty, Lord Elcho proposed that assistants should be admitted on passing a *modified* examination, and even to that proposition his lordship had to accept the additional condition of a period of three years' service as an assistant. Such assistants must make application *before the last day of the present year*, not necessarily to be examined before that time, but that the filing of their applications may be secured, and their registration in due course obtained. Again, we call special attention to the dates put down in the Bill.

Much disappointment will undoubtedly be felt at the omission of the clause exempting all chemists and druggists from serving on juries. The legitimate reason for excusing them from this duty rests on the fact that men who have to minister to the necessity of the public in cases of emergency, and who frequently have no better substitute than a young apprentice to leave in charge of what may be called dangerous duties, are of more value to the community in their own shops than in the jury-box. The exempting clause passed through the House of Lords, and was unchallenged until it reached the committee of the Commons. Perhaps its rejection there may be explained by the fact that the report of a commission appointed specially to consider the jury laws generally had just been presented, and it will scarcely surprise those who have read an article on that report which appeared in the 'Times' of July 28th. Of course, the argument against non-service was the complimentary one usually put forth, that, in striking chemists off the jury panel, you deprive the country of the best qualified class of men now liable to serve. It was scarcely to be expected that in giving to chemists and druggists the sole right to sell or compound poisons, Parliament would do so without imposing some fixed rules to be observed. We can all of us look back to the proposals contained in former Poison Bills,—proposals of mechanical contrivance, and a certain system of segregating poisons in all shops alike,—proposals, in fact, to be applied under all circumstances, whether fitting or not, and quite independent of the discretion of the master of the shop, who might, for all which appeared to the contrary, be utterly ignorant of the danger of the articles in which he dealt; and it seems but natural, although education is now taken as a groundwork, that some of these traditions should still linger among officials, who are prone to make and govern model communi-

ties on foolscap, and keep them in perfect order by a band of red tape, loth even to adopt the more convenient india-rubber strap, which would to a certain extent adapt itself to circumstances. The attempt to apply the restrictions of the Arsenic Act to the sale of all poisons, more especially when such popular medicines as "opium and its preparations" are included, will appear at once to practical men as absurd. The registration of the sales of laudanum in the Fen districts would be almost impossible. That opium is a dangerous poison none can deny; and, in erasing it from the schedule of the draft Bill before going to Parliament, the Society only yielded to what appeared to be an absolute necessity. It has been replaced by the House of Commons in Part II., which will simply confine its sale to qualified persons, and render proper labelling compulsory. Another proposition of Mr. Lowe, that poisonous preparations which are in the Pharmacopœia might be sold in quantities not exceeding "*one medicinal dose*" only, without the order of a medical practitioner, or under the provisions of the Arsenic Act, seemed equally impracticable. Medicines compounded by apothecaries, and by chemists registered under the new Act, are to be exempted from the formalities of the 17th clause, and to this exemption Mr. Lowe endeavoured to add the qualification, that the medicines made by chemists should be those only ordered in the prescriptions of legally qualified medical practitioners. But the House of Commons would have none of this; and on one of these propositions, as will be seen by the report of the debate, the right honourable gentleman found only two members on his side in the division. Words were added, compelling dispensers to copy into their books all compounds containing poisons, which we think can be no real inconvenience, as most chemists already make entry of prescriptions. We mention these matters to show the difficulties which have had to be surmounted.

Want of space prevents our describing more fully the provisions of the Bill. All men should study it for themselves; and we believe few, having mastered its details, will fail to find in it much that will be of service to the public by securing the proper education of all future chemists and druggists, and preventing the indiscriminate traffic in articles which have heretofore been too often employed for improper purposes. On the advantages gained by chemists themselves, it is needless to enlarge. The Pharmaceutical Society has ever endeavoured to raise their status by enforcing a better qualification to maintain it, and by promoting that union among them which has now been accomplished, after many years of anxious exertion.

MEANS FOR PREVENTING ACCIDENTAL POISONING.

The provisions for preventing the improper use of poisonous substances will not be complete, notwithstanding the labours which the Legislature has devoted to the subject during this and previous sessions of Parliament, until some further arrangements and regulations have been made regarding dangerous medicines. Such regulations are contemplated in the Act which has just been passed, and they may be made from time to time by the Pharmaceutical Society with the concurrence of the Privy Council. The subject is one of considerable importance, involving several points of detail, and it merits the serious attention, not only of pharmaceutists but of members of every branch of the medical profession. Questions will naturally arise as to the best methods of arranging and labelling the bottles in which dangerous and other drugs are kept for use in dispensing, of distinguishing, when dispensed, such medicines as may be safely administered internally from those which are intended for external use, and of drawing attention to those medicines intended for internal administration which require great care or special precautions to be observed in using

them. Questions may also arise as to the best methods of adjusting the doses of medicines, whether the teaspoon, tablespoon, and wineglass, are proper measures to use in such cases, or whether the graduated glass and bottle, as more accurate means of measuring liquids, ought not to be adopted. The necessity for the consideration of questions such as these becomes more pressing in proportion as an increased number of very active substances, which in a concentrated state are powerful poisons, are added to the *Materia Medica* in daily use. The stock of a druggist's shop of fifty years ago would bear no comparison with that of a modern pharmaceutical establishment, in regard to the powerful and dangerous nature of the medicines contained in it. Greater responsibility rests upon the dispenser of medicines now than formerly, and much more stringent regulations are rendered necessary by the altered circumstances of the case. Many of these regulations relate so exclusively to the internal arrangements of the shop or dispensary, that those only who have practical experience in dispensing can fully judge of the extent to which they are likely to realize the required object. Details of this description will therefore be most successfully devised and carried out by those who have the strongest and most direct interest in their operation. But there are other cases in which it is desirable that pharmaceutists should confer and act in concert with medical practitioners.

Much may be done to lessen the dangers attending the administration of medicines by judiciously adjusting the composition and strength of preparations which are required to be kept by the pharmaceutist, and are commonly prescribed by the physician. Complicated combinations should, as far as possible, be avoided, especially such as contain dangerous ingredients. There are, unfortunately, a large number of medicines frequently prescribed, for the preparation of which there are no authorized formulæ, but which are made according to processes adopted by one or more pharmaceutists, who indicate only to those who purchase or prescribe them, the proportions of some of the most active of their constituents. Sometimes even this information is not accorded, and preparations containing strychnia or other poisonous substance are dispensed without a knowledge, by those who order or sell them, of what their real composition and properties are. This is one of the evils of the existing state of the practice of medicine which loudly calls for some interference. Of secret and indefinite compounds containing strychnia, many of which are prescribed by medical men, it may be said the name is "legion." A diminution in the number of these would be a most desirable result to attain, but it could only be realized by the united efforts of medical and pharmaceutical associations. The existing evil would perhaps be most effectually mitigated by a resolution on the part of the medical profession to discountenance the use of secret or proprietary medicines, and in every possible way to encourage the publication of formulæ for the preparation of remedies which may have resulted from the application of the combined knowledge and experience of the physician and the chemist.

But not only is it desirable to discourage the use of secret remedies and to counteract the tendency to undue complications, much may also be done to lessen the dangers attending the administration of medicines, by reducing the strength both of officinal preparations and also, and especially, of medicines in the form in which they are prescribed for use. The example set by the highest medical authority has been in this direction, nearly all the alterations which have been made in the medicines ordered in the Pharmacopœia having effected reduction rather than increase of strength. In this way dangerous medicines may be rendered comparatively harmless, while, on the other hand, by the process of concentration safe and harmless remedies may be converted into destructive agents, capable, if a slight error should be committed in their administration, of injuring health or destroying life.

A case of accidental poisoning with strychnia which has recently occurred,

and an account of which will be found in another part of this Journal, affords a striking illustration of the danger attending the too prevalent practice of prescribing concentrated medicines. We append an article from the 'British Medical Journal,' referring to this case, in which the subject is discussed from a medical point of view.

PHYSICIANS' PRESCRIPTIONS.

There may be some doubt as to the propriety of deducing from the melancholy case of accidental poisoning by strychnia this week the rule that poisonous medicines should only be dispensed in "danger bottles;" but there can, we think, be very little as to the moral which should be drawn from it by prescribers who have adopted the prevalent modern fashion of ordering medicines in highly concentrated forms, so that a very few drops only constitute an ordinary dose. The administration of medicine thus becomes almost a nice manipulation of the laboratory, for which nurses, careless women, and ignorant servants are left responsible; while the smallness of the total bulk of medicine ordered easily leads to terrible catastrophes. We have before drawn attention to this danger; the sad fate of Miss Campbell will enforce the warning, and that it may not be supposed that this incident is the result of any very unusual form of prescription, we have selected the following examples of such prescription from the current books of one dispensing firm. One prescription before us contains one grain of strychnia in a fluid ounce of water, ten drops for a dose; another contains two grains of strychnia in an ounce and a half mixture, the order being to take ten minims every morning and increase the dose up to fifteen minims. Each of these small "draught" bottles would, of course, prove poisonous if the contents were swallowed under the same kind of mistake as that into which Miss Campbell fell; and the excessive concentration of the medicines makes the measurement of the dose a matter of undue nicety. But even these are less dangerous forms of prescription than two others presented at the same house (but privately referred to the physician for dilution before dispensing them)—the one being simply for two drachms of dilute prussic acid, without written directions, and undiluted, the directions having been given to the patient verbally; the other ordering half an ounce of dilute prussic acid, pure and simple, with the direction that "five drops are to be taken three times a day in water." There are in this book many other prescriptions which have had to be revised by their authors owing to the caution of the chemist, including very large quantities of arsenic in a concentrated colourless solution; bromide of potassium ordered by the ounce, and to be measured unmixed by the patient by the "quarter-teaspoonful." This is a mode of prescribing which has obvious danger and inconvenience to the patient, and, of course, no advantage to the physician. It is adopted chiefly, we believe, with a view to economy for the patient, who gets more for his money from the chemist when the concentrated solutions, or crude medicines, are ordered than when a duly diluted mixture is prescribed. As a matter of fact, however, we believe that the average net trade profits of pharmaceutical chemists are small, although the apparent and immediate profit on the drug is large. There are very few fortunes made in that business; there are very few large incomes among retail dispensing chemists. The public, at our instance, and with the consent of their own body, are requiring from them a long apprenticeship, and a good knowledge of the scientific part of their business, and their customers have to rely much on their conscientiousness, skill in compounding, care, and watchfulness. They work hard, they are required to exercise unceasing vigilance in their business, and are liable to heavy damages for blunders dangerous to life. All this ought to be considered when people talk of the profits of chemists,—when medicines are ordered in a very concentrated form, to the evident risk and discomfort of the patient, but that he may get the largest amount of material for the smallest amount of money. A few more prescriptions from the same book will exemplify the kind of care which a vigilant chemist is bound to exercise. One prescription orders a dose of the solution of arseniate of potash, amounting to fifteen drops three times a day; another orders four grains of opium in a pill; and so on through a long catalogue. There are few physicians who are not conscious of having little accidental slips of prescribing corrected by the dispenser; and we all look to the dispenser to note and represent or remedy any such accidental and

obvious *lapsus*. There are other classes of prescriptions, although not slips of the pen, which require, too, a very bold man to dispense them. Thus, we find here a small plaster ordered to be made with three grains of pure aconitine, rubbed up in two drachms of extract of belladonna, to be applied *en permanence* to the skin under leather. Another prescription is for 10 grains of bicyanide of mercury, in a half-ounce of distilled water, as a lotion. When to these are added the ordinary risks of a business in which poisons are constantly handled, and which requires, for its due prosecution, considerable knowledge, care, and conscience, we are led to doubt whether our profession do well in saving the purses of their patients by a mode of prescribing which has only the advantage of lessening somewhat the profits of the chemist, but does so at a price, which has more than once been paid, of calamitous accident to the patient.—*British Medical Journal.*

TRANSACTIONS

OF

THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *July* 1*st*, 1868,

Present—Messrs. Abraham, Bottle, Bourdas, Brady, Carteighe, Deane, Edwards, Evans, Haselden, Hills, Ince, Mackay, Morson, Randall, Sandford, Savage, Squire, Standring, Stoddart, and Williams.

The following were elected Members:—

Bell, James Alfred .....Hastings.
Crow, Edwin Lewis .....Lewisham.
Lescher, Frank Harwood .....London.
Thomas, John Ashlin .....Boston.
Walker, Charles .....London.

MEMBERS ELECTED *June* 3, 1868.

(*Omitted last Month.*)

Foulkes, William H. .....Rhyl.
Lake, John Hinton .....Exeter.
Squire, Peter Wyatt .....London.
Warren, George Robert .....Brighton.
Waugh, Alexander .....London.

The list of Local Secretaries was submitted and approved.

The following reappointments were made for the ensuing year:—

Theophilus Redwood, Ph.D., F.C.S., Professor of Chemistry and Pharmacy.

Robert Bentley, M.R.C.S., F.L.S., Professor of Botany and Materia Medica.

John Attfield, Ph.D., F.C.S., Professor of Practical Chemistry and Director of the Laboratories.

William Augustus Tilden, F.C.S., Demonstrator of Practical Chemistry.

BENEVOLENT FUND.

The sum of Ten Pounds (second grant) was voted to a Member residing in Worcestershire.

SUBSCRIPTIONS AND DONATIONS RECEIVED DURING JUNE AND JULY.

SUBSCRIPTIONS.

LONDON.

	£	s.	d.
Blandford, J. F., 9, Bruton St.	0	5	0
Burden, Thomas, 6, Store St. .	0	10	6
Cracknell, Chas., Edgeware Rd.	2	2	0
Groves, H. F., Clapham.....	1	1	0
Stocken, James, 33, Euston Sq.	0	5	0
Trotman, A. C., 29, Chapel St.,	0	10	6
Warner, Richard, and Co., 20, Charterhouse square	1	1	0

COUNTRY.

	£	s.	d.
Bideford, Hogg, Thomas	0	5	0
Bridport, Tucker, Charles	0	10	6
Brighton, Smith, William	0	10	6
Burslem, Blackshaw, Thomas...	0	10	6
Cheltenham, Butcher, Thomas..	2	2	0
Crewkerne, Strawson, Henry ...	0	10	6
Darlington, Swenden, James...	0	10	0
Dartmouth, Rees, Wm. Henry.	0	10	6
Deal, Green, John	0	10	6
Exeter, Tanner, Nicholas W....	0	5	0
Exeter, Tanner, Benjamin	0	5	0
Harrold, Fever, William	0	10	6
Lasswade, Macdonald, John ...	0	5	0
Manchester, Halliday, Wm. J..	0	10	6
Oldham, Bagshaw, William ...	0	10	6
Rhyl, Foulkes, William H. ...	0	10	6
Rotherham, Booth, Nathaniel..	0	10	6
Spilsby, Rainey, Edward.....	0	10	6
Yarmouth, Mabson, William ...	1	1	0

DONATION.

	£	s.	d.
Lescher, Frank Harwood, 60, Bartholomew Close.....	2	10	0

ERRATUM in June number, page 550, line 10 from bottom, *for* 10*s.* 6*d.* *read* 5*s.*

BOARD OF EXAMINERS, *July* 16*th*, 1868.

Present—Messrs. Bird, Carteighe, Darby, Edwards, Evans, Gale, Hanbury, and Haselden.

Twenty-two Candidates presented themselves for the Major and Minor Examinations; the following seventeen passed, and were duly registered:—

MAJOR (as Pharmaceutical Chemists).

Bateman, Thomas Henry .....Salisbury.
Bird, Robert .....Southampton.
*Bridges, Charles William.....London.
Cocks, John Walter.....Torrington.
Cryer, Henry .....Colchester.
*Edwards, John Jones .....Brecon.
Gerrard, Alfred William.....London.
Padwick, Thomas.....Havant.
*Samuel, Edward .....Ramsgate.
Sandall, William.....Worcester.
Sleggs, George Richardson.....Market Weighton.
*Stiles, Matthew Henry .....Rugby.
*Walton, George Chapman .....Bedford.
Wise, Walter .....Maidstone.

MINOR (as Assistants).

Beasley, Frederick .....Maidstone.
Peake, Henry Felix.....Southampton.
Tranter, Frederick James .....Bath.

ADJOURNED MEETING, *July* 17*th*, 1868.

Present—Messrs. Bird, Cracknell, Darby, Edwards, Gale, Hanbury, and Haselden.

Seven Candidates presented themselves for the Major and Minor Examinations; the following six passed, and were duly registered:—

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* Passed in honours; eligible to compete for the Pereira Medal.

MAJOR (as Pharmaceutical Chemists).

*Abraham, Thomas Fell	Liverpool.
*Arkinstall, William	Cheltenham.
*Franklin, Alfred	Winchester.
*Hughes, John Taylor	Altrincham.
Wharton, William	London.

MINOR (as an Assistant).

Kinch, Edward	Henley-on-Thames.

REGISTERED APPRENTICES AND STUDENTS.

Name.	Residing with	Address.
Battams, James Scott	Messrs. Garratt	Rugby.
Bond, James William	Mr. Hurst	Louth.
Jones, Rees Thomas	Messrs. Vines and Froom	London.
Merrick, Thomas Henry	Messrs. Garratt	Rugby.
Metzler, Henry	Mr. Metzler	London.
Stanley, Herbert	Mr. Shaw	Stockport.
Wiles, Henry	Messrs. Anthony and Son	Bedford.
Woolstencroft, Benjamin	Mr. Manifold	Weaverham.

FORMATION OF A CHEMICAL SOCIETY IN NEWCASTLE.

On June 29, a meeting was held in one of the rooms of the Literary and Philosophical Society, Westgate Street, Newcastle, for the purpose of considering the desirability of establishing a Chemical Society. The chair was occupied by Sir W. G. Armstrong, and the attendance was good. Messrs. E. I. J. Browell, H. B. Brady, John Pattinson, A. F. Marecco, T. S. Alder, and B. S. Proctor, were among those present. Mr. Marecco explained that the proposal had originated chiefly with Mr. R. C. Clapham, who was at present in London. He believed the Literary and Philosophical Society would give them the use of one of their rooms. The proceedings would consist of the reading of papers by the members, and they could be published at the end of each session. The society would also be useful in obtaining chemical publications, such as they could not well get otherwise. Mr. Brady said they had been in communication with the Chemical Societies of Dublin and Glasgow, and the rules of the former appeared suitable to their case. Sir William Armstrong observed that they should first determine whether it was desirable to form such a society and then consider whether it was likely to receive sufficient assistance. They often found that people got lukewarm about societies after they had been a short time in existence, and then they fell to the ground.—Mr. Marecco said Mr. Bell, Mr. Pattinson, Mr. Daglish, Mr. Bowman, Dr. Lunge, Mr. Palmer, and others, had promised to aid it so far as they could. However, the question must lie with the great bulk of the chemists in the district.—Mr. Proctor was afraid that a society whose only object was the reading of papers would very soon die, and suggested that they should endeavour to obtain some rare instruments, such as chemists were not likely to possess.—Mr. France said a society of the kind proposed would be very useful to the young men employed in the various chemical manufactories in the district. Mr. Browell remarked that nearly every profession had its union, and he thought the chemists should be no exception to the general rule.—Mr. Pattinson thought one of the principal objects should be the reading of papers on the local manufactures. Opinions might be expressed that would prove very useful to the manufacturers of the district. It would also be useful in bringing about a uniform method of analysis.—A series of rules was then submitted and agreed to. They may be briefly summarized as follows:—The society to be called "The Newcastle Chemical Society;" that intending members be nominated by three members; that the annual subscription be 10s.; that the meetings be held once a month from October to March inclusive; and that papers intended to be read be forwarded to the secretaries and approved or otherwise by the committee. All the rules, with slight modifications, were approved of and adopted on the motion of Mr. Brady, seconded by Mr. Alder. The following gen-

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* Passed in honours; eligible to compete for the Pereira Medal.

tlemen were then appointed a provisional committee, to complete the arrangements and ascertain how many members there were likely to be:—Messrs. E. I. J. Browell, H. B. Brady, John Pattinson, R. C. Clapham, J. W. Swan, W. H. Richardson, Dr. Lunge, Mr. B. S. Proctor, and Mr. A. F. Marecco—the last-named gentleman to act as secretary *pro tem.* A vote of thanks to Sir William Armstrong for presiding brought the proceedings to a close.—*Northern Daily Express, June* 30, 1868.

DEBATES IN THE HOUSE OF COMMONS ON THE BILL TO REGULATE THE SALE OF POISONS, AND ALTER AND AMEND THE PHARMACY ACT OF 1852.

Tuesday, July 7th, 1868.

On the question that the Speaker do leave the chair,

Mr. Lowe said: Sir,—I wish to call the attention of the Government to a Bill which is passing through this House, called the Sale of Poisons and Pharmacy Bill, and to ask the Government whether any security will be given to the House and the country against the Bill being passed through Committee improperly or hurriedly. It is a measure of very great importance, and I hope the Government will give some facilities for discussing its principle. The noble lord the Vice-President of the Committee of Council, gave notice that he would move that the Bill should be referred to a Select Committee, but that notice has, I am sorry to see, been withdrawn and some amendments have been put on the notice paper in substitution, but they do not seem to touch the main question, which is, whether powers of licensing persons to sell dangerous drugs shall be entrusted to persons who are in truth a mere voluntary association. I hope the Government will take care that an opportunity be given for discussing the principle of the Bill, and that the Bill be not allowed to pass through Committee between two and three in the morning without discussion. The Government ought to obtain some security from this voluntary association that the provisions of the Bill will be properly carried into effect.

Mr. Headlam: My right honourable friend has brought this matter before the House without any sort of notice to me, which I think is open to objection.

The Speaker intimated to the right honourable Member for Newcastle that he had already spoken upon the question, and that he was consequently out of order in speaking again.

Lord R. Montagu: It is quite true that I gave notice of a motion to refer this Bill to a Select Committee, but after a conference with the right honourable gentleman the Member for Newcastle, who has charge of the Bill, and with the President of the Pharmaceutical Society, the promoters of the Bill, and having regard to the fact that the Bill was introduced in the other House by Earl Granville, and that the provisions of it were sanctioned by the members of the Government in that House, I have thought it expedient to withdraw my own notice of motion; and I now propose to introduce certain amendments in Committee of the whole House, so that the Bill may, if possible, be passed in the present Session. The Bill is not under my charge, and I cannot therefore give any undertaking as to the hour at which it ought to be proceeded with.

Friday, July 10th, 1868.

Mr. Headlam: Sir,—I now move that you do leave the chair, and that we go into Committee on this Bill.

The question being put,

Mr. Lowe said: I shall be very glad to go into a discussion upon this Bill and its principle if the House will attend to what may be said, and I can assure honourable Members present that a great deal will have to be said if they will attend to it; but I would tell my right honourable friend who has charge of the measure, that it will hardly be possible to pass it through Parliament this Session, for it is a measure of very great importance to the country, and particularly to those who vend poisons. However, if the Bill is to be proceeded with, it ought not to go on now at half-past one in the morning, but a time ought to be fixed when the House can do full justice to all parties concerned in the provisions of the Bill.

Mr. Headlam: If my right honourable friend will take the responsibility of rejecting

this Bill let him do so, but I do not think the country will sanction such a proceeding. There cannot be a better time for going into Committee, considering the late period of the Session. There are only some small verbal amendments on the paper, and under these circumstances I do not think we shall have a more favourable opportunity of proceeding than at this present moment. Of course my right honourable friend can avail himself of any opposition to progress being made, but if he throws the Bill over by postponement from time to time, why he must take the responsibility.

The House then went into Committee, Mr. Dodson in the chair.

Lord R. Montagu moved that in line 21 after the word "druggist," the words "or pharmacist, or dispensing chemist, or druggist" be inserted.

The amendment was agreed to.

Mr. Lowe moved that in line 2, page 2, after the word "Act," the words "and be registered under this Act" be inserted, and said, "This amendment which I propose will alter the whole scope and object of this Bill, and in this way:—The Bill at present makes it optional to the persons referred to, to register or not,—they need not be registered unless they like. Of course it means that this optional registration shall be confined to those chemists and druggists now in business, but my amendment will make it compulsory even upon these gentlemen to come in under the Act and be registered, and unless this registration be insisted upon the Act will not work at all."

Mr. Headlam: There are manifest objections entertained to this amendment. This Bill, or rather a similar one, was introduced some years ago, and was submitted to a Select Committee; that was in 1865. The Select Committee did not require the registration of those persons who are now carrying on the business of druggists, and this Bill has been framed in accordance with the suggestions of the Select Committee, and has been circulated all over the country. It will be seen that all these persons now in business have been led to suppose that this Bill will be passed in accordance with the report of the Select Committee, and if it be not passed in accordance with that report, they will consider that there has been a breach of faith. I must therefore oppose the amendment.

Mr. H. A. Bruce: I hope the Committee will adopt the suggestion of my right honourable friend the Member for Calne. This subject was inquired into by the Committee of the Privy Council in 1863, and Dr. Alfred Taylor was consulted, and he reported that the sale of poisons could not be satisfactory unless it was carried on by proper and competent persons, and in that report I concur. If persons are allowed to sell drugs without being first registered, what security will there be to the public? It is evident to us all that many persons under the name of druggists are now entrusted with the selling and compounding of poisons, who are utterly ignorant of the nature of these poisons and of the general effect of drugs.

The Home Secretary: I also think that there ought to be a list of all persons who sell poisonous drugs.

Mr. Headlam: The Bill has been circulated in its present form, and the amendment may be considered a breach of faith.

The amendment was agreed to by the House without a division.

Lord R. Montagu: In line 3, page 2, after "keeping" insert "dispensing," agreed to. And in the same line, after "may," insert from "time to time," agreed to.

Mr. Lowe: In the same clause I move to leave out the words "Pharmaceutical Society with the consent of the."

Mr. Headlam: I understand that these words were introduced by the noble duke at the head of the Privy Council. They seem to me to be exceedingly valuable, and I think they ought not to be expunged. The regulations as to the keeping and selling of poisons will be prescribed by the Pharmaceutical Society with the consent of the Privy Council. It seems perfectly clear that these two bodies, the Pharmaceutical Society, who will prepare these regulations which will relate to their own trading, and the Privy Council, will act together; for the latter will have to give their consent to the regulations. It cannot be objected that there ought to be some regulations relating to the sale of poisons; nor can it be objected, I think, that these regulations ought in the first instance to be framed by the Pharmaceutical Society. Then, having had the sanction of that body, they ought to go before the Privy Council for their sanction and approval.

Lord R. Montagu: There will be greater security to the public if the words be left in as proposed.

Mr. Lowe: I think the clause as framed is nonsense. The idea is, that the persons referred to shall conform to certain regulations which, with the consent of the Privy Council, shall be prescribed by the Pharmaceutical Society, but by a mistake of the draftsman, the Privy Council are not asked to sanction the regulations, they are only to consent to the Society prescribing them, and my objection is against making it unlawful unless the persons referred to shall conform, in regard to the sale of poisons and to the keeping open a shop, to what the President and Committee of the Society shall call regulations.

Lord R. Montagu: It will be quite lawful to keep open a shop without any regulations, but it will not be lawful to vend poisons without them. The verbal criticism can be attended to now or on the report.

Mr. Thomas Cave: There are two things to be attended to, under this clause, in keeping open a shop for the sale of poisons; first, the not assuming the title of chemist and druggist without being registered, and the conforming to such regulations as may be prescribed.

Mr. Lowe: In clause 2 I shall move to leave out the words "the Council of the Pharmaceutical Society of Great Britain (hereinafter referred to as the Pharmaceutical Society) may from time to time, by resolution, declare that any article in such resolution named ought to be deemed a poison within the meaning of this Act." The object I have is this:—It is desirable that the public shall know the number and names of the poisons against which regulations have been made. The Arsenic Act is published and put in force, and you will want somebody to prosecute under this Act, and certainly the Pharmaceutical Society will be a most unfit body. The Act ought to be placed under the care of the police and in the hands of a department of the Government, and certainly not left in the hands of those who will live by the sale of poisons; if that be so, the restrictions imposed will be of little value.

Mr. T. Cave: The right honourable gentleman is entirely wrong in his premises, as it is now necessary that a paper shall be signed in reference to the purchase of arsenic. This Bill will extend to other articles the powers of that Act.

Mr. Lowe: Just so, and the matter ought to be left in the hands of the Privy Council.

Mr. T. Cave: I do not see any objection to the clause as it stands.

Mr. H. A. Bruce: I shall support the amendment, for I desire to enlarge the powers of the Privy Council, who have already a medical department. The clause as it stands will restrict the powers of the Privy Council, and I see no advantage in doing that.

Sir John Gray: I also think the matter ought to be left with the Privy Council.

Mr. Headlam: I object to the amendment. What is proposed is, to get rid of the Pharmaceutical Society in this matter, and then to enact that another gentleman, the medical officer of the Privy Council, for that will be the effect of it, shall by his own *ipse dixit* declare what is a poison and what is not. I think that will be most objectionable.

Lord R. Montagu: It is not quite so. The point is to restrict the sale of poisons, and probably the Pharmaceutical Society will not publish all the necessary restrictions if the matter be quite left to them. I think the matter should be left with the Privy Council.

Mr. Alderman Lusk: I think if the matter be left with the Pharmaceutical Society there will be no fear of their doing their duty.

Mr. Thomas Cave: There has been no sound argument against the clause, and I think there will be a great advantage to the public if this matter be left with the Pharmaceutical Society.

The Committee then divided.

For the retention of the words	49
Against them	25
Majority against the amendment of Mr. Lowe	24

Sir J. Gray: I would suggest that nothing more should be done by the Pharmaceutical Society than to make suggestions to the Privy Council as to what things shall be deemed poisonous.

This amendment or suggestion, not being pressed, was negatived without a division.

The clause as amended was ordered to stand part of the Bill.

On clause 2, "poisons within the meaning of the Act,"

MR. LOWE: I now move to leave out the words I have just read (see above), and to insert in their place, "it shall be lawful for the Privy Council, from time to time as it may see fit, to order that other articles (being drugs or compounds of drugs which may be dangerous to life) shall be poisons within the meaning of this Act, and every such order of the Privy Council shall be published."

MR. HEADLAM: This amendment raises precisely the same question as that just decided, and I must oppose it.

MR. H. A. BRUCE: I hope the Committee will reconsider their decision, as more power should, on the part of the public, be given to the Privy Council. There is a medical department of the Council, and more power should be given to the chief officer of it, in order that he may say what evils arise from the present practice of selling poisons. It is a department of the State acting for the public interests.

MR. THOMAS CAVE suggested the insertion of the words after "Great Britain," "or other legally constituted medical body," and said he should be quite willing to meet the objection of the right honourable gentleman.

LORD R. MONTAGU: I trust the right honourable gentleman will not press this amendment, for it is substantially the same as that which the Committee have already decided, and after disposing of this there will be no other important amendment to deal with.

MR. LOWE: The difference is this, the other amendment referred to poisons and regulations touching the sale of them, and this one refers to what shall be poisons, and in the interest of the public I must press it for consideration.

MR. HEADLAM: As the clause stands there will be sufficient security to the public, for all new poisons will be published in the Gazette.

SIR R. COLLIER: It appears to me that the Pharmaceutical Society will know more about this matter than the Privy Council, and that they will attend to it in a much better manner.

LORD R. MONTAGU: There is already a great list of poisons in the schedule of the Bill, and all others resolved upon will be included from time to time.

MR. LOWE: If there be one poison more used than another it is opium in various forms, and this will not come under any regulations, not being named in the schedule.

LORD R. MONTAGU: It can be inserted when we come to the schedule.

MR. LOWE: The Pharmaceutical Society would leave it out, and it is a most dangerous poison. Perhaps because more profit is got out of the sale of this poison it is not proposed to deal with it.

MR. T. CAVE: The object of not inserting it was not so much as it concerns the Pharmaceutical Society as it does the grocers and others who sell this article without any control whatsoever. The schedule can be extended when under consideration.

MR. AYRTON: I have sat on two Select Committees, unfortunately, and we could not come to any agreement, and it is now proposed that the chemists shall be allowed to enlarge their list of poisons just as they like, and it will be nobody's business to restrict them.

MR. T. CAVE: Yes. Nothing will be in the schedule without the consent of the Privy Council.

MR. AYRTON: The Privy Council will give themselves up to any theory that may be suggested, and this schedule will grow and grow to the manifest injury of trade in this country; because those who have been disappointed in love have drunk the contents of a bottle, therefore, it is proposed to put oxalic acid into the schedule, and to prevent its sale to servant maids, except by persons who have undergone a serious examination. When on the Select Committee, we examined upstairs a large number of scientific witnesses, and day after day we heard a vast lot of nonsense. I can see no good reason for what is now proposed by the clause, and it seems to me that the matter should be left with the Privy Council. I think oxalic acid ought to be struck out of the schedule.

MR. PAULL: The honourable and learned Member attributes greater ignorance to persons than is justifiable. As this question is a large one, it will be better to report progress.

The amendment was then put from the chair and negatived.

LORD R. MONTAGU: After the word "London" insert "and Edinburgh Gazettes," agreed to.

MR. EYKYN proposed to include "Dublin."

LORD R. MONTAGU: The Bill does not extend to Ireland.

Sir P. O'Brien: I propose to insert a clause extending the Act to Ireland, and therefore we may as well now agree to the amendment of the honourable Member for Windsor.

Lord R. Montagu: If the honourable baronet's clause be agreed to, we can agree to this amendment on the report.

Colonel Fane: At this hour (eight minutes to two) we ought to report progress, and that I move.

The Committee divided.

For reporting progress . . .	33
Against it	39
Majority . . .	6

Mr. Headlam: Let us pass this clause; it will not occupy much time to do so. I do not wish to press the Committee to sit much longer, but as there are many Members here who take an interest in this measure, it will be well to dispose of this clause.

Mr. Sclater Booth: I wish to remind hon. Members that this is by no means the last order, and that after the orders there is other business to dispose of. There will be plenty of time next week to consider these amendments, and it is really too much to ask us to go on with them now.

The clause was then, as amended, agreed to.

On clause 3,

Lord R. Montagu: Leave out "heretofore" and insert "before the passing of this Act," agreed to. And after "associates" insert "who before the passing of this Act shall have been." The object is to bring in assistants who are registered. Agreed to.

On the question that clause 3 stand part of the Bill,

Mr. Acland: I object to that, as I think there ought to be a discussion upon the principle of this clause.

Lord R. Montagu: This clause is simply an interpretation one.

Mr. Acland: There ought to be a discussion on the Bill before we proceed further. The Pharmaceutical Society is not a corporation, and we are proceeding to pass a law which will end in chaos. It is now two o'clock, and we ought to report progress.

Sir H. Edwards: I move that we report progress. Half of the Committee have been asleep for a long time. It is not whether the measure be a good or a bad one, but we ought to have it before us at a proper time for our consideration.

Mr. D. Bromley: I must correct the honourable baronet, the Member for Beverley. I have seen him in profound slumber for some time past.

Sir H. Edwards: My honourable friend the Member for Warwickshire is entirely in error. I must say if not half the Committee certainly very many have been asleep for some time.

A division was called for, but none took place. The clause was agreed to.

Lord Elcho: I hope this Bill will be allowed to pass this Parliament this Session. I have served on two Select Committees, and believe that there ought to be some legislation in regard to the sale of poisons. We were never so near a settlement of the question as at present, and I do hope we shall dispose of it this year.—The Chairman was then ordered to report progress.

The House having resumed, the Bill was ordered to be again committed on Wednesday, the 15th of July.

Wednesday, July 15, 1868.

The Committee on this Bill was resumed on clause 4.

Lord R. Montagu: If the noble lord consents to omit this clause, I will agree to that. If not omitted altogether, it will require amendment.

Lord Elcho: Perhaps the Committee will allow me to explain my position with regard to this Bill; I have been most unexpectedly asked to undertake the conduct of this Bill through Committee, in consequence of my right honourable friend the member for Newcastle-upon-Tyne (Mr. Headlam), who has charge of it, being unable to remain in London. As this Bill very much represents the views I endeavoured humbly to advocate on a former occasion, I have consented to endeavour to carry it through Committee, and, therefore, I hope honourable Members will assist me as much as they can in my endeavour to attain that object. With regard to clause 4, I propose to strike it out, and substitute the one which stands in my name on the paper, *videlicet*,—"Any

person who, at the time of the passing of this Act, shall be of full age, and shall produce to the registrar on or before the thirty-first day of December, one thousand eight hundred and sixty-eight, certificates according to Schedule (E) to this Act, that he had been actually engaged and employed in the dispensing and compounding of prescriptions as an assistant to a Pharmaceutical Chemist, or to a chemist and druggist, as defined by clause 3 of this Act, shall, on passing such a modified examination as the Council of the Pharmaceutical Society, with the consent of the Privy Council, may declare to be sufficient evidence of his skill and competency to conduct the business of a chemist and druggist, be registered as a chemist and druggist under this Act." The object of the clause is this. There are, at the present moment, a great many assistants engaged in chemists' shops who are advanced in life, and are fully competent to discharge their duties, but who, if my right honourable friend's (Mr. Lowe) proposition be carried, will be shut out altogether. That clause is as follows:—

"The persons who at the time of the passing of this Act shall have been duly admitted Pharmaceutical Chemists, or shall be chemists and druggists within the meaning of the Act, shall be entitled to be registered under the Act without paying any fee for such registration. Provided, however, as regards any such chemist and druggist, that his claim to be registered must be by notice in writing, signed by him, and given to the registrar, with certificates according to the Schedules C and D to this Act; and provided also, that for any such registration of a chemist and druggist, unless it be duly claimed by him on or before the thirty-first day of December, one thousand eight hundred and sixty-eight, the person registered shall pay the same fee as persons admitted to the register after examination under this Act."

I believe my right honourable friend considers that these persons, because they do not possess shops, have no vested interests to protect and preserve. They have, however, their past career to conserve, but if they are at once to be struck out of this measure, and have to pass a more severe examination than that I propose, or can be reasonably expected from them at the present time, I think it would be a very great hardship upon them. I venture, therefore, to suggest, that a compromise might be very satisfactorily come to, whereby these persons might pass a modified examination, and not one so strict as was originally proposed. At any rate the standard can be fixed jointly by the Pharmaceutical Society and the Privy Council. I hope, therefore, the Committee will support the amended clause which I intend to propose.

Mr. Hardy: We are all agreed that clause 4 in the Bill should be struck out; that had therefore better be done, and the discussion on the amended clause taken when the time comes for proposing new clauses.

Clause 4 was then struck out of the Bill.

On clause 5—

Mr. Lowe: I object to this clause.

Lord Elcho: I consent to the omission of this clause, and the insertion of my right honourable friend's clause. I move that it be omitted from the Bill.

Clause 5 was then struck out.

On clause 6—

Lord R. Montagu: I propose to amend this clause by inserting the words "as amended by this Act," which will make the clause read thus, "or as the same may be varied, from time to time, by any bye-law to be made in accordance with the Pharmacy Act as amended by this Act," with the approbation of one of her Majesty's principal secretaries of state."

The amendment was agreed to.

Clause 6 as amended was ordered to stand part of the Bill.

On clause 7, application of fees to purposes of the Pharmaceutical Society,

Lord R. Montagu amended the clause by striking out the words "such fees shall be payable" at the commencement of the clause, and reinserting them lower down, whereby the clause reads, "Upon every such examination and registration as aforesaid such fees shall be payable," etc. etc.

The amendment was agreed to.

The clause as amended was ordered to stand part of the Bill.

Clause 8 was agreed to.

Clause 9 was agreed to.

Clause 10 was agreed to.

Clause 11 was agreed to.

On clause 12, which provides that evidence of qualification shall be given before registration.

Lord R. Montagu: I propose to amend this clause, as follows: "no name shall be entered in the register except of persons authorized by this Act to be registered; nor unless the registrar be satisfied, etc."

The amendment was agreed to.

The clause as amended was ordered to stand part of the Bill.

On clause 13,

Lord R. Montagu: I propose to amend this clause by inserting that the register shall be printed and published in the month of January in every year.

The amendment was agreed to.

The clause as amended was ordered to stand part of the Bill.

Clause 14 was agreed to.

On clause 15,

Lord R. Montagu: I propose to amend the clause by altering the wording "any person keeping an open shop for the retailing, dispensing, or compounding poisons" to any person who shall sell or keep, etc., and by the insertion of the following words: "or who shall compound any medicines, except according to the formularies of the British Pharmacopœia, unless otherwise specially directed in written prescriptions," shall for every such offence be liable to a penalty of five pounds, etc.

Mr. Lowe: I object to the addition of the words proposed by my right honourable friend. The British Pharmacopœia is no doubt a very excellent work, and although it has not been many years before the public, no doubt it is working its way on its own intrinsic merits; speaking, however, on the opinion of medical men of eminence, it is not desirable that it should be forced on the public by Act of Parliament, but rather that it should be left in its present position. It may be right to do so, but the time has not yet arrived when we can force it on the public.

Lord R. Montagu: The object of my amendment is this, that if a chemist has a prescription to compound according to the British Pharmacopœia he shall not compound it according to any other Pharmacopœia, so that a different medicine to that intended by the physician shall not be compounded.

Mr. Lowe: What are medicines of the British Pharmacopœia?

Lord R. Montagu: The Pharmacopœia of London, the British, and Edinburgh are different, and the effect of my amendment is, that if a physician prescribes according to the British Pharmacopœia none other shall be compounded.

The Irish Attorney-General: It is a matter of considerable importance; I was told by a physician, that if a prescription I had for the eye when in Dublin had been compounded in London instead of in Dublin I should have received considerable injury, as one would have been so much stronger than the other.

The amendment was agreed to.

On the motion that the clause as amended stand part of the Bill,

Mr. W. E. Forster: I want to know why you insert the words "unless specially directed."

Lord R. Montagu: Merely because it is necessary. What I mean is this: that if a prescription is taken to a chemist founded on the British Pharmacopœia, he shall not substitute those of the London Pharmacopœia.

Mr. Thomas Cave: The words, I think, go a little further than that; for when not defined, the chemist shall be compelled to use the British Pharmacopœia.

Lord R. Montagu: I don't think the words carry it so far as that.

Mr. Thomas Cave: They are capable of that meaning; but what is the chemist to do if the physician omits to put B. P. or L. P.? In that case I think it should be stated the chemist is to use the British.

Lord R. Montagu: I have no objection to the introduction of words to that effect.

Mr. Lowe: Had we not better leave the clause and reconsider it on the report? In the meantime we can take advice upon it.

The Irish Attorney-General: The provisions of the Bill are throughout intended for Great Britain, and, consequently, they cannot be made applicable to Ireland. The better plan will be to pass this clause, and afterwards bring up a short clause providing that the Bill shall not extend to Ireland. If desirable, it can be made applicable next year to Ireland by the introduction of a short measure for that purpose.

Mr. W. E. Forster: The words as they now stand have this effect, that if no mention is made in the prescription according to which Pharmacopœia it is to be prescribed, the chemist will have power to prescribe in any way.

Lord R. Montagu: That is not my intention. If these words bear that interpretation we had better alter them, but I do not think they do.

The clause, as amended, "or who shall compound any medicines of the British Pharmacopœia except according to the formularies of the said Pharmacopœia," was agreed to and ordered to stand part of the Bill.

On clause 16,

Mr. Thomas Cave: This clause is as follows:—that "nothing hereinbefore contained shall extend to or interfere with the business of any duly qualified medical practitioner, or of any member of the Royal College of Veterinary Surgeons of Great Britain; nor with the making or dealing in patent medicines; nor with the business of wholesale dealers in supplying poisons in the ordinary course of wholesale dealing; nor with the retailing of arsenic, oxalic acid, cyanide of potassium, or corrosive sublimate for use in manufactures; and upon the decease of any pharmaceutical chemist or chemist and druggist actually in business at the time of his death, it shall be lawful for any executor, administrator, or trustee of the estate of such pharmaceutical chemist or chemist and druggist, to continue such business if and so long only as such business shall be *bonâ fide* conducted by a duly qualified assistant, and a duly qualified assistant shall be, according to the meaning of this clause, a pharmaceutical chemist or a chemist and druggist, registered by the registrar under the Pharmacy Act or this Act." I beg to move the omission of the following words:—"the business of any duly qualified medical practitioner, or of any member of the Royal College of Veterinary Surgeons of Great Britain, nor with." My simple object in moving this amendment is, that after the passing of this Act, duly qualified medical practitioners and members of the Royal College of Veterinary Surgeons shall be under the same provisions of this Act with reference to the sale of poisons, as the general body of chemists and druggists.

Lord Elcho: I hope the Committee will not assent to this amendment.

Mr. Thomas Cave: I don't think the noble lord quite understands the object of my omitting these words. My object is not to interfere with duly qualified persons, but simply to alter their mode of proceeding, so that as the public would be prevented from having these poisons from unqualified persons, the same facilities shall not be open to them to obtain them from qualified persons. By the clause as it at present stands, as I understand it, medical practitioners and veterinary surgeons will be able to do that which you wish to prevent others from doing.

Lord R. Montagu: By the clauses we have already passed nobody but qualified persons can sell these poisons. I confess I am at a loss to understand the object the honourable Member has in moving to omit these words.

Mr. Lowe: The effect of the amendment, if carried, would be that these persons shall not sell poisons unless they passed an examination as Pharmaceutical Chemists. These words, if adopted, will limit the sale of poisons to certain persons only.

Mr. Cave withdrew his amendment.

Mr. Lowe: I move to omit the words "nor with the retailing of arsenic, oxalic acid, cyanide of potassium, or corrosive sublimate for use in manufactures." I think we ought to interfere with the retailing of these poisons, because at present they can be retailed to any extent, and in any shop, and by any person, which I am sure is a state of things no honourable Member can wish to see perpetuated. A gentleman, a friend of mine, by way of experiment, went into a general shop in Oxford Street, and asked for some cyanide of potassium, when he was supplied, without question, with a quantity sufficient to have poisoned the whole of the people residing in Oxford Street. There are numerous instances of poisoning through mistake, from the facility of obtaining these poisons. We profess to regulate the sale of poisons by this Bill, yet we propose to leave the most subtle poisons to be sold by ignorant and disqualified persons because it is said they are used and required in ordinary manufactures and household duties. I think it is most absurd to attempt such legislation as this.

Lord R. Montagu: The words were not originally in the Bill, but on the representation of certain persons in Bedfordshire that oxalic acid is used to a great extent in the whitening of straw-plait, and that also many of these poisons are daily used in ordinary household duties it was thought advisable to insert the words, or else the public would

be put to considerable inconvenience; for instance, a man who wanted any of the s articles for cleaning his boot-tops, or a housemaid for cleaning domestic articles, would otherwise have to go, in country districts, a considerable distance before they could find a duly qualified chemist and druggist from whom they could obtain them. In that case a great hardship would be inflicted upon these persons.

Lord Elcho: I hope the Committee will retain these words. I know and have experienced the difficulty of finding duly qualified persons in out-of-the-way places, and in the Highlands, on one occasion, I was glad to avail myself of the drugs and the services of a man who sold fiddles, whipcord, hob-nail shoes, who, in fact, kept an American store, and who, on my applying to him, produced his gallipots from amongst a general and miscellaneous stock; I can only say that I was greatly benefited by what he compounded for me. If such a bill as this (and without such a provision) had been the law of the land, I must have gone to a town some distance off to have had my prescription compounded. In regulating these matters we must not too much interfere with the trade of the country. Certain poisons, it appears, are used for the commonest purposes of life, and no doubt they may be used for very evil purposes, but at the same time I think we ought to be very careful how we interfere with this trade. Oxalic acid is used for cleaning fire-irons and grates, and if you prohibit general dealers from selling, housemaids will be prevented from obtaining it in small towns; it is used, again, for cleaning top-boots, and as about 150 of these articles are used in the ordinary and common purposes of daily life, I do not think it is advisable to over-*doctrinaire* the country with provisions against the sale of poisons. It is sufficient for the present if we protect ourselves against their improper use in the compounding of medicines. The clause gives as much security as possible under the circumstances.

Mr. Lowe: This clause says that we shall not interfere with the sale of certain poisons, yet by the schedule of the Act it is proposed to deal with them. In this manner it is proposed to regulate the sale of poisons, and, amongst others, that of arsenic and oxalic acid. It seems to me a strange mode of proceeding.

Lord R. Montagu: No one desires to prevent housemaids from obtaining oxalic acid for cleaning fire-irons. What we want to do is to take care that it shall not be sold unless under certain precautions with reference to labelling and so forth. What is intended is, that the sale of these poisons shall be properly regulated.

Mr. Thomas Cave: The object is not to place these poisons under the restrictions of this Act in every respect, but to make regulations in issuing them from the shop; we all know perfectly well Madeline Smith's case.

The Committee divided, the numbers were:—

For the retention of the words . . .	30
Against it	58
Majority	28

The words were then struck out.

Lord R. Montagu: I beg to propose the following addition to the clause:—"Provided always that a registration under this Act shall not entitle any person so registered to practise medicine or surgery, or any branch of medicine or surgery."

This amendment was agreed to.

This clause, as amended, was ordered to stand part of the Bill.

On clause 17,

Lord Elcho: I move that the clause be struck out.

Mr. Lowe: The noble lord's new clause will be a great improvement upon this, which it is proposed to omit from the Bill, but there are still a great many objections to it. The new clause which the noble lord proposes to substitute for the one to be struck out of the Bill is, as follows:—"It shall be unlawful to sell any poison of those which are marked with an asterisk in Schedule (A) to this Act, to any person unknown to the seller; and on every sale of such article the seller shall, before delivery, make or cause to be made an entry in a book to be kept for that purpose, stating in the form set forth in the Schedule (F) to this Act, the date of the sale, the name and address of the purchaser, the name and quantity of the article sold, and the purpose for which it is stated by the purchaser to be required, to which entry the signature of the purchaser or his agent shall be affixed, and it shall be unlawful to sell any poison whatsoever to a person

unknown to the seller, unless he gives evidence that he requires it for a legitimate purpose, and is aware of the uses, danger, and proper dose, as the case may be, of such poisons; and it shall be unlawful to sell any poison either wholesale or by retail, unless the box, bottle, vessel, wrapper, or cover in which such poison is contained be distinctly labelled with the name of the article and the word "poison," and with the name and address of the seller of the poison, and any person selling poison otherwise than is herein provided, shall, upon a summary conviction before two justices of the peace in England or the sheriff in Scotland, be liable to a penalty not exceeding £5 for the first offence, and to a penalty not exceeding £10 for the second or any subsequent offence; and, for the purposes of this section, the person on whose behalf any sale is made by any apprentice or servant, shall be deemed to be the seller; but the provisions of this section, except as regards labelling and the word "poison," shall not apply to articles to be exported from Great Britain by wholesale dealers, nor to sales by wholesale to retail dealers in the ordinary course of wholesale dealing, nor shall any of the provisions of this section apply to any medicine supplied by an apothecary to his patient, nor apply to any article when forming part of the ingredients of any medicine dispensed by a person registered under this Act, and nothing in this Act contained shall repeal or affect any of the provisions of an Act of the Session, holden in the fourteenth and fifteenth years in the reign of her present Majesty, intituled "An Act to Regulate the Sale of Arsenic." Now, I think it is a very inconvenient way of designating poison by means of an asterisk, but rather that they should be divided and stated in two classes in the schedule. The restrictions as to whom the poisons are to be sold are absurd, for how can an old woman, in a village, who sells these things, ascertain the truth or falsehood of the person's statement requiring these articles? The chemist and druggist is to take evidence upon this point, but I see no clause in the Bill empowering him to administer an oath, and it is not at all probable that a man who wants to commit suicide or murder will state the real purposes for which the poison is required, and, that being so, where is your security? Again, although a man might want it for the most legitimate purposes, he is not to have it unless he is aware of the uses, danger, and the proper dose, as the case may be, of such poison. The remainder of the clause I do not so much object to, but why not follow the provisions of the Arsenic Act, which has not been of very extensive application, because it only applies to a single poison? but if you apply it to all poisons you will be extending a very salutary piece of legislation. The provision was made that if a false statement was made as to the use to which the arsenic was to be applied, that it should be good evidence against the party in a court of justice. There was nothing in arsenic beyond its cheapness that rendered it necessary to guard against its indiscriminate sale.

Lord Elcho: This clause, as amended, has been drawn, after a long interview with the medical officer of the Privy Council. I am much mistaken if my right honourable friend does not know to whom I allude, and I am much mistaken if his objections to the amended clause have not been founded on the gentleman's representation. The amended clause proposes a middle course, and, with regard to the Arsenic Act, I am told it is unreasonable to follow its provisions, because they are so stringent as to make the Act in a great measure a dead letter. It is to provide against that evil that the new clause has been drawn up. I can therefore only ask the Committee to decide between the clause proposed by my right honourable friend as representing, practically, the medical officer of the Privy Council, and that proposed by those gentlemen who are practically engaged in this business. Whatever orders or regulations are in existence in this country, relative to the sale of poisons, are entirely due to these gentlemen who form the Pharmaceutical Society. They have done great public service since their incorporation. They have a most excellent school of pharmacy; they have excellent and extensive laboratories; lectures of the highest class are delivered at the institution, and it is a body whose opinions are entitled to respect and consideration.

Lord Robert Montagu: There is no security in the clause as proposed by the noble lord. The intention of the clause is no doubt good, but I think that the clause proposed by the right honourable gentleman, the Member for Calne, is rather better, and carries out the noble lord's intention.

Mr. M. Chambers: The words proposed by the right honourable gentleman, the Member for Calne, raise a question that does not appear to have been touched upon during the debate. The word "poison" is used, and it appears to me that every person

selling poison must label it "poison." It is a well-known fact that the best medicines are sometimes composed of the most deadly poisons. Homœopathic chemists use deadly poisons to a large extent, and what I want to know is, whether, if I go to one and ask him for a bottle of his little gilded or silvered pills, he is to label the bottle poison? and must I give him my name and address, and state to him for what purpose I want them, and also must I take with me a witness to test to the truth of my statement? It seems to me that this would be the inevitable consequence of this clause.

Mr. Lowe: I doubt if a whole bottle of homœopathic medicine could do much harm.

Clause 17 was struck out.

Clause 18, Mr. T. Cave remarked that chemists and druggists ought to be excused from the jury list. The clause, however, was struck out.

Clauses 19, 20, and 21, with amendments according to notices by Lord R. Montagu, were agreed to, and ordered to stand part of the Bill.

Clauses 22, 23, and 24 were agreed to without amendments.

Clause 25 was agreed to with an amendment by Lord R. Montagu, that on and after the passing of this Act all powers vested by the Pharmacy Act in one of her Majesty's principal Secretaries of State shall be vested in the Privy Council.

Clauses 26 and 27 were agreed to.

Lord Elcho then proposed his substituted clause for clause 4.

Mr. Lowe: I must oppose this clause on the ground that it is wholly indefensible. Either these persons have vested interests, or they have not; if they have not, then they have to undergo an examination the same as all others who are in a similar position. If it is desirable to have an examination, it should be one of a defined and satisfactory character.

Lord Elcho: As the clause originally stood in the Bill all assistants, if they registered themselves up to the 31st of December in this year, were to be registered as properly qualified chemists to compound medicines, etc., without an examination. That, I thought, was too loose; but at the same time I thought they should not be called upon to pass too stringent an examination, and that it was desirable some compromise should be adopted that should give protection to the public and not press too hardly on these persons. I agree to the suggestion of the honourable Member for Barnstaple that the operation of the clause should be limited to assistants of four years' standing. The examination, though of a modified character, is to be one laid down by the Privy Council and the Pharmaceutical Society.

Mr. Thomas Cave: Some of these assistants have been in business and have failed, others are married men with families, consequently too high a standard of examination for them would almost ruin their prospects.

Lord R. Montagu: I think the clause should be amended by the insertion of words applicable to assistants who, before the passing of the Act, were duly qualified under the Pharmacy Act, and a further amendment that they should have been actually engaged in dispensing and assisting in a shop for not less than four years.

Mr. Alderman Lusk: I should think two or three years sufficient. We should not be too hard on these men.

The first amendment was agreed to, and the clause as amended was agreed to, and was ordered to be added to the Bill.

Mr. Lowe: I beg to move the following clause:—"The persons who at the time of the passing of this Act shall have been duly admitted Pharmaceutical Chemists, or shall be chemists and druggists within the meaning of the Act, shall be entitled to be registered under the Act without paying any fee for such registration; provided, however, as regards any such chemist and druggist, that his claim to be registered must be by notice in writing signed by him and given to the Registrar, with certificates according to the Schedules C and D to this Act; and provided also, that for any such registration of a chemist and druggist, unless it be duly claimed by him on or before the 31st day of December, 1868, the person registered shall pay the same fee as persons admitted to the register after examination under this Act."

The clause was agreed to, and was ordered to be added to the Bill.

Lord Elcho: I beg to move a new clause for the clause 17 which we have struck out of the Bill.

Mr. Lowe: I see that certain poisons are designated by an asterisk which are not to be sold by the chemist to a person unknown to the seller, I wish to know upon what principle this distinction is based.

Lord Elcho: Those marked with an asterisk are those which are most commonly and generally used for criminal purposes.

Mr. Lowe: Others are not uncommonly used as poisons for the destruction of life. We know that John Sadleir destroyed himself with essential oil of almonds. Oxalic acid, cantharides, and, in fact, all those you propose to leave in the second class, with permission to sell without all the restrictions, are often used to destroy life. I beg to move the omission of this distinction.

Lord Elcho: I am informed it is necessary and convenient that the proposed distinction should be maintained in the schedule. If it be the wish of the Committee to abolish this distinction, I must reserve to myself the right of bringing up a new schedule on the report.

The clause was agreed to in the following amended form and added to the Bill:—"It shall be unlawful to sell any poison to any person unknown to the seller, unless introduced by some person known to the seller; and on every sale of any such article the seller shall before delivery make or cause to be made entry in a book to be kept for that purpose stating, in the form set forth in the Schedule (F) to this Act, the date of the sale, the name and address of the purchaser, and the name of the person, if any, who introduced him, the name and quantity of the article sold, and the purpose for which it is stated by the purchaser to be required, to which entry the signature of the purchaser shall be affixed, and it shall be unlawful to sell any poison, either wholesale or by retail, unless the box, bottle, vessel, wrapper, or cover in which such poison is contained be distinctly labelled with the name of the article and the word "poison," and with the name and address of the seller of the poison, and any person selling poison otherwise than is herein provided shall, under a summary conviction before two justices of the peace in England, or the sheriff in Scotland, be liable to a penalty not exceeding five pounds for the first offence, and to a penalty not exceeding ten pounds for the second or any subsequent offence, and for the purposes of this section the person on whose behalf any sale is made by any apprentice or servant shall be deemed to be the seller, but the provisions of this section, except as regards labelling, and the word "poison" shall not apply to articles to be exported from Great Britain by wholesale dealers, nor to sales by wholesale to retail dealers in the ordinary course of wholesale dealing, nor shall any of the provisions of this section apply to any medicine supplied by an apothecary to his patient, nor apply to any article when forming part of the ingredients of any medicine dispensed by a person registered under this Act and nothing in this Act contained, shall repeal or affect any of the provisions of an Act of the Session holden in the fourteenth and fifteenth years in the reign of her present Majesty, intituled "An Act to Regulate the Sale of Arsenic."

Mr. Eykyn: I have given notice of the following clause:—That from and after the passing of this Act every person duly qualified and registered under it as "chemist and druggist," or "chemist" or "druggist," being thereby entitled to keep open shop in Great Britain, for the compounding of the prescriptions of duly qualified medical practitioners, shall in like manner be deemed to be qualified to keep open shop for the compounding of prescriptions in Ireland, and shall not be subject for so doing to any prosecution or penalty, notwithstanding any enactment to the contrary in the Apothecaries Act of Ireland of 1791, 31 Geo. III. c. 184. I have no wish to press the clause, if the learned Attorney-General for Ireland will undertake to bring in a Bill for Ireland next Session.

The Attorney-General for Ireland: I shall be happy to keep the pledge, if I am in a position to do so next Session.

The clause was not proposed.

Mr. Lowe: I beg to move the following clause:—"The provisions of the Act of the twenty-third and twenty-fourth of Victoria, chapter eighty-four, intituled, 'An Act for Preventing the Adulteration of Articles of Food or Drink,' shall extend to all articles usually taken or sold as medicines, and every such adulteration of every such article shall be deemed an admixture injurious to health, and any person registered under this Act, who sells any such article adulterated, shall, unless the contrary be proved, be deemed to have knowledge of such adulteration."

Mr. M. Chambers: If this clause is agreed to, it will be throwing an undue and an unfair responsibility upon the retail chemist or druggist, because, as was shown on a former occasion, he is greatly at the mercy of the wholesale druggist.

The clause was agreed to, and ordered to be added to the Bill.

Mr. Lowe next proposed the following clause:—"It shall be the duty of every person who sells, retails, dispenses, or compounds drugs, to use by himself and his assistants all practicable care and precautions for preventing the commission of mistakes in such business, and not to allow any unskilled person to take part in such business in the selling, retailing, dispensing, or compounding of poisons."

The object of the clause is to prevent those gross mistakes which too frequently arise from gross negligence.

Mr. W. E. Forster: I hope the Committee will accept the clause. Its object is to prevent a repetition of what is now notoriously known as the Bradford Poisoning Case, where eight or nine were killed, and about one hundred others injured.

Mr. Sergeant Gaselee: I don't think the right honourable gentleman (Mr. Lowe) is aware of what he is proposing. Gross negligence is considered a felony in law. It would be better, if such a clause is to be inserted in the Bill, to declare that it shall be a misdemeanour, otherwise it would defeat the object of the Bill.

Mr. Hardy: I think there will be great difficulty in legally interpreting this clause. Without the negligence has caused some kind of damage the clause is inoperative. I take it the right honourable gentleman means that, in cases where injury arises from neglect of duty, the person so acting shall be responsible for his act criminally or civilly, but that is not expressed in the clause.

The Solicitor-General: The question of gross negligence is well known to the law, and judges have no difficulty in directing a jury upon the point. A man would not be a bit more criminally liable for gross negligence under this clause than he is by the present law. I really think it would be better not to press the clause.

Mr. Lowe: I will withdraw the clause, but I hope the Government will take the matter into their consideration, and frame a clause to meet the difficulty, and bring it up on the report.

Mr. Russell Gurney: Something of the kind is wanting. It ought not to depend on mischief arising from neglect.

Lord Elcho: This Bill has reference only to poisons, but this is something beyond its scope.

Mr. Lowe: I can be poisoned as well by having wrong medicine given me as by taking actual medicine.

Mr. Hardy: The difficulty is how you are going to prove what is the particular care and caution a man should use. It is a very difficult subject to take up, and settle in a Bill of this kind.

The amendment was withdrawn.

The Attorney-General for Ireland: I beg to move a clause that the Act shall not apply to Ireland.

Agreed to.

On Schedule A.

Lord Elcho: I have to propose the adoption of this schedule. I have taken up this Bill on the distinct understanding that there shall be a difference made in the sale of poisons for ordinary household purposes, and subtle poisons used in medicines, and without that distinction I understand the Bill will break down.

Mr. Lowe: I am at a loss to know what my noble friend means by subtle poisons.

Lord Elcho: I stand on the principle that it is necessary to draw this distinction. The lists have been given to me by those who understand the trade.

Lord Robert Montagu: I think it will be better to make the alteration upon the bringing up of the report.

Mr. Knatchbull-Hugessen: I think such stringent restrictions will defeat the Bill.

Mr. Bruce: I admit the noble lord's principle, but I cannot see how we can draw the distinction in this Bill. We have been passing stringent regulations for preventing medicinal poisons from being used for causing death, but if we surround a certain number with restrictions and leave others open, the consequence will be that persons will poison themselves with those that are left open. It seems important to surround the sale of all poisons with some safeguards.

Mr. T. Cave: You are going to leave out some of those poisons which it is of the greatest importance to keep in; there should be the greatest difficulty in obtaining subtle poisons for instance. Any one who resides in the country knows well enough the popular belief with regard to cantharides, and the vile purposes for which it is fre-

quently obtained. A man who requires a suspicious poison ought to give some information for what he requires it.

Mr. Lowe: What we have done is this,—we have said that no man shall sell deadly poisons to unknown persons, except he is introduced to the chemist, etc. Is the Committee, by this schedule, prepared to go back? It is true we cannot legislate for all poisons, but what I should like would be to see the provisions of the Arsenic Act further carried out. Instead of dividing the schedules, I think, if my noble friend confers with the Pharmaceutical Society, he will, in all probability, be able to propose something to which we can agree. I will, however, move that the following shall be added to the list in Schedule A:—"Opium and all preparations of poppies, and such other poisons as may from time to time be added under the second section of this Act."

The final decision on the schedule was then postponed until the bringing up of the report.

The Bill, upon that understanding, passed through Committee.

Friday, July 17th, 1868.

On the order of the day that this Bill as amended in Committee be considered,

Lord Elcho said: I have some amendments to propose, first in page 2, line 3, to insert after "prescribed" the word "jointly," and in line 4, after "society" to leave out "with the consent of," and to insert "and;" and in clause 15, page 6, line 8, after "pharmacist," to insert "not being a pharmaceutical chemist," and after "pursuance of this Act," leave out "not being a pharmaceutical chemist." Agreed to.

Lord Elcho: I now move the insertion of a clause in lieu of clause 17. It is on the paper, and is as follows:—

"*Regulations to be observed in the Sale of Poisons.*

"It shall be unlawful to sell any poison, either by wholesale or by retail, unless the box, bottle, vessel, wrapper, or cover in which such poison is contained be distinctly labelled with the name of the article and the word poison, and with the name and address of the seller of the poison; and it shall be unlawful to sell any poison of those which are in the first part of Schedule (A) to this Act, or may hereafter be added thereto under section second of this Act, to any person unknown to the seller unless introduced by some person known to the seller; and on every sale of any such article the seller shall, before delivery, make or cause to be made an entry in a book to be kept for that purpose, stating, in the form set forth in Schedule (F) to this Act, the date of the sale, the name and address of the purchaser, the name and quantity of the article sold, and the purpose for which it is stated by the purchaser to be required, to which entry the signature of the purchaser and of the person, if any, who introduced him shall be affixed; and any person selling poison otherwise than is herein provided shall, upon a summary conviction before two justices of the peace in England or the sheriff in Scotland, be liable to a penalty not exceeding five pounds for the first offence, and to a penalty not exceeding ten pounds for the second or any subsequent offence; and for the purposes of this section the person on whose behalf any sale is made by any apprentice or servant shall be deemed to be the seller, but the provisions of this section which are solely applicable to poisons in the first part of the Schedule (A) to this Act, or which require that the label shall contain the name and address of the seller, shall not apply to articles to be exported from Great Britain by wholesale dealers, nor to sales by wholesale or retail dealers in the ordinary course of wholesale dealing, nor shall any of the provisions of this section apply to any medicine supplied by an apothecary to his patient, nor apply to any article when forming part of the ingredients of any medicine dispensed by a person registered, and nothing in this Act contained shall repeal or affect any of the provisions of an Act of the session holden in the fourteenth and fifteenth years of the reign of her present Majesty, intituled 'An Act to Regulate the Sale of Arsenic.'"

The clause having been read a second time by the Clerk reading the words "Regulations to be observed in the Sale of Poisons,"

Mr. Ayrton: I now propose to leave out of this new clause the words in the sixth line, "or may hereafter be added thereto, under section second of this Act," and for this reason that it will not be right to give to the Privy Council a definitive power, which, if exercised, might very materially interfere with the general trade of this country. This is a power which can only be exercised by Parliament, and it is a power which the Privy Council ought not to have under any circumstances whatsoever; I therefore propose to omit these words.

MR. LOWE: I very much object to this proposed amendment, for it is equivalent to saying that there shall be no new poison defined without a new Act of Parliament. The Privy Council, as my honourable and learned friend must know, are entrusted with the exercise of powers quite as large as the proposed one in this clause, and surely they may be trusted with such a power as this, which may be found most useful in practice. Besides the Pharmaceutical Society will, with the consent of the Privy Council, say what the new poison is, and together, proper directions will be given with regard to it in the Gazettes.

MR. NEATE: I entirely concur with the views of my right honourable friend the Member for Calne.

MR. LUSK: I think if new poisons are discovered, they ought to be designated in a new Act of Parliament.

LORD ELCHO: I asked the Pharmaceutical Society what their opinion is, and they said they saw no reason why the words should not be struck out of the clause.

MR. LOWE: I do not represent the Pharmaceutical Society; I object to the words being struck out on the part of the public; I think it will be for the good of the public that they should be retained.

The question was put, that the words should stand part of the clause, and the Speaker declared that the "*Noes*" had it, consequently the words were struck out.

MR. LOWE: I think that this amendment, which has been carried by an agreement between the noble lord and the Pharmaceutical Society, amounts to a breach of faith with the House.

MR. H. A. BRUCE: The amendment is entirely inconsistent with other amendments which the House has already sanctioned.

MR. LOWE: I now propose to add after the words in the fourth line from the end of the clause "under this Act," the words "under the written prescription of a legally qualified medical practitioner," and if these words be not agreed to, all directions against the sale of poisons will be liable to be evaded in some cases; for instance, any man may enter a shop and ask for some strychnine in an ounce of water, and the chemist may give it to him in his shop, and it may be drunk off, and against the chemist there will be no remedy whatever. That is what my amendment will neutralize; and if it be not inserted, all the provisions of this Bill may be neutralized. If you say that chemists and druggists may dispense anything they please themselves, they will be able to make up compounds of the most deadly poisons and sell them as they like, and this Act will not stop them or give any remedy against them, and consequently all your precautions will go for nothing. It will be better far to lose the Bill altogether, and that I prefer if this amendment should be rejected.

LORD ELCHO: My right honourable friend complained just now of a breach of contract, but though I deny that there was any on my part, I must say that this amendment is very much like one on his part. Two days ago this matter was very much discussed, and this clause has been drawn up in the form thought to be the most desirable, and is one which it was hoped would pass through this House. If, therefore, what my right honourable friend complained of was a breach of contract, which I demur to, certainly this is a stronger breach of contract, because my right honourable friend never intimated on Wednesday that he intended to propose these words. The gentlemen representing the Pharmaceutical Society say that these words were not in any clause agreed to on Wednesday last. What my right honourable friend seems anxious to do is to prevent any dispensing whatever, except under the signature of some legally qualified medical practitioner. What does dispensing mean? When I asked this question I was told it meant the making up of medicine and not prescribing, but these gentlemen say that physicians do not sign their name in full but merely their initials, so that you will require that a chemist residing, say at Exeter, shall know the signature of a physician residing at Edinburgh or Aberdeen, or he shall not dispense the medicine. Such an amendment will involve us in many difficulties, and I hope it will not be insisted upon.

MR. BRUCE: If this amendment be not agreed to at the instance of the noble lord, he will stultify his own clause. What is this clause? It is that chemists and druggists shall not sell poisons unless to persons known to them. It is so as regards certain articles, and it is now proposed that they shall not dispense the poisons unless under the prescription of some other person.

Mr. Ayrton: This amendment will not meet the case which the right honourable gentleman, the Member for Calne, seems to have in view, because any man will be able to make up a prescription which is signed by a practitioner, and if he should take a paper professing to be so signed that will be no offence. My right honourable friend is always, though impartially, severe in his reasoning; he says, in effect, you shall not sell a man a cord because he may hang himself, nor sell him a poison because he may poison himself, nor sell him a pistol because he may shoot himself, and he seems anxious to make the sale of any of these commodities a felony. I do not see that that can be done. A chemist ought not to be prevented from dispensing medicines with poison in the compound because another person may poison himself. I do not think the amendment proposed would in practice work, and therefore I hope the right honourable gentlemen will not press it.

Mr. Neate: I do not suppose that any single member of this House can write a prescription that would be understood by any chemist or druggist in the kingdom. I shall vote against the amendment.

Mr. Lowe said he must insist on dividing the House.

Lord Elcho: Dividing now will be equivalent to postponing the Bill. Does my right honourable friend mean to insist on his amendment?

Mr. Lowe: Yes; certainly.

The House then divided.

For adding the words . .	2
Against it	14
Majority	12

The division showing that only 16 members (less than a house) were present, the House stood adjourned at half-past two o'clock.

Monday, July 20th, 1868.

The amendments to this Bill were again considered. The amendment of Mr. Lowe above mentioned was again proposed, and on the question being put, that the words "under the written prescription of a legally qualified medical practitioner" be inserted, it was resolved in the negative; and, instead thereof, it was agreed that the following words be added:—"provided such medicine be labelled in the manner aforesaid with the name and address of the seller, and the ingredients thereof be entered, with the name of the person to whom it is sold or delivered, in a book to be kept by the seller for that purpose."

On the motion of Mr. Ayrton, the following words were struck out of clause 2:—"and the Council of the Pharmaceutical Society of Great Britain (hereinafter referred to as the Pharmaceutical Society) may from time to time, by resolution, declare that any article in such resolution named ought to be deemed a poison within the meaning of this Act; and thereupon the said Society shall submit the same for the approval of the Privy Council, and if such approval shall be given, then such resolution and approval shall be advertised in the 'London and Edinburgh Gazettes,' and on the expiration of one month from such advertisement the article named in such resolution shall be deemed to be a poison within the meaning of this Act."

Tuesday, July 21st, 1868.

On the motion of Mr. Ayrton this Bill was read a third time and passed.

HOUSE OF LORDS.

Friday, July 24th, 1868.

On the consideration of the Commons' amendments to the Sale of Poisons and Pharmacy Act Amendment Bill,

The Duke of Marlborough: My Lords,—I have been asked to move your Lordships to agree in the main with the Commons' amendments. There are two or three exceptions to be made. In the first place, in line 6, after the word "Act," leave out to the end of clause 2; and there are one or two consequential amendments. To all the other amendments I move, that this House do agree with the said amendments.

The Lord Chancellor put the question, and, without discussion, the House disagreed with the amendments above specified, and agreed to all the other Commons' amendments.

MONDAY, JULY 27TH, 1868.

The Lords' reasons for disagreeing with the above amendment:

"Because, in the absence of such an enactment, it would become necessary to have frequent recourse to the Legislature to extend the Act to poisonous substances which may hereafter from time to time come into use for medical or other purposes."

HOUSE OF COMMONS.

TUESDAY, JULY 28TH, 1868.

On the motion of Lord Robert Montagu, "That this House doth not insist upon the amendment to which the Lords have disagreed." The motion was carried without discussion.

Clause 1.—Another amendment proposed, in page 2, line 3, to leave out the words "Pharmaceutical Society, with the consent of the:"—(*Mr. Lowe:*)—Question put, "That the words proposed to be left out stand part of the clause:"—The Committee *divided;* Ayes 49, Noes 25. (See page 58.)

Ayes.

Ayrton, Acton Smee
Baines, Edward
Beaumont, H. Fred. (York, W. R.)
Bentinck, George Cavendish
Bowyer, Sir George
Candlish, John
Cave, Rt. Hon. Steph. (New Shore.)
Cavendish, Lord Edw. (Sussex, E.)
Cavendish, Lord G. (Derbysh. N.)
Clinton, Lord Edw. P. (Notts, N.)
Collier, Sir Robert Porrett
Cowen, Joseph
Davey, Richard (Cornwall, W.)
Dimsdale, Robert
Edwards, Sir Henry (Beverley)
Elcho, Lord
Evans, Thomas William
Eykyn, Roger
Fergusson, Sir James
Gower, Hon. F. Leveson (Bodmin)
Gurney, Rt. Hon. Russell (South.)
Hankey, Thomson
Hardy, Rt. Hon. Gathorne (Oxf. U.)
Heygate, Wm. Unwin (Stamford)
Ingham, Robert
Jervoise, Sir Jervoise Clarke
Leatham, Edw. Aldam (Hudders.)
Leatham, Wm. Hen. (Wakefield)
Lusk, Andrew
Morrison, Walter
Northcote, Rt. Hon. Sir Stafford H.
O'Brien, Sir Patrick
Parry, Thomas
Peel, John (Tamworth)
Powell, Francis Sharp
Pritchard, John
Rearden, Denis Joseph
Schreiber, Charles
Sclater-Booth, George
Severne, John Edmund
Sherriff, Alexander Clunes
Smith, Jervoise (Penryn)
Speirs, Archibald Alexander
Thompson, Matt. W. (Bradford)
Vivian, Henry Hussey (Glamor.)
Waldegrave-Leslie, Hon. George
Waring, Charles
Wise, Henry Christopher
Wyndham, Hon. H. (Sussex, W.)

Tellers for the Ayes, Mr. Headlam and Mr. Thomas Cave.

Noes.

Acland, Thomas Dyke
Beach, Sir Michael Hicks (Glos. E.)
Booth, Sir Robert Gore
Bruce, Rt. Hon. Hen. Austin (Mer.)
Coleridge, John Duke
Davenport, William Bromley
Dyott, Colonel Richard
Fane, Col. John W. (Oxfordsh.)
Fitzwilliam, Hon. C. W. W.
Gore, Jn. Ralph Ormsby (Salop, N.)
Gorst, John Eldon
Gray, Sir John (Kilkenny)
Hamilton, Lord Claud (Tyrone)
Hervey, Lord Aug. H. C. (Suff. W.)
Kendall, Nicholas
Lowther, James (York)
Neate, Charles
Paull, Henry
Robartes, Thomas James Agar
St. Aubyn, John
Seymour, George H. (Antrim Co.)
Sturt, Lt.-Col. Napier (Dorchest.)
Warren, Rt. Hon. Robert R.
Winterbotham, Hen. Selfe Page
Wyndham, Hon. P. (Cumb. W.)

Tellers for the Noes, Mr. Lowe and Lord Robert Montagu.

Motion made, and Question put, "That the Chairman do report Progress, and ask leave to sit again:"—(*Lord Robert Montagu:*)—The Committee *divided;* Ayes 33, Noes 39. (See page 61.)

Ayes.

Acland, Thomas Dyke
Beach, Sir Michael Hicks (Glos. E.)
Booth, Sir Robert Gore
Bruce, Rt. Hon. Hen. Austin (Mer.)
Cave, Rt. Hon. Steph. (New Shore)
Cavendish, Lord G. (Derbysh. N.)
Coleridge, John Duke
Davey, Richard (Cornwall, W.)
Dyott, Colonel Richard
Edwards, Sir Henry (Beverley)
Fane, Col. John W. (Oxfordsh.)
Fergusson, Sir James
Gore, Jn. Ralph Ormsby (Salop, N.)
Gorst, John Eldon
Gower, Hon. F. Leveson (Bodmin)
Hamilton, Lord Claud (Tyrone)
Hardy, Rt. Hon. Gathorne (Oxf. U.)
Hervey, Lord Aug. H. C. (Suff. W.)
Jervoise, Sir Jervoise Clark
Lowe, Rt. Hon. Robert
Lowther, James (York)
Norchcote, Rt. Hon. Sir Stafford H.
Paull, Henry
Powell, Francis Sharp
Robartes, Thomas James Agar
St. Aubyn, John
Seymour, George H. (Antrim Co.)
Sherriff, Alexander Clunes
Smith, Jervoise (Penryn)
Waldegrave-Leslie, Hon. George
Warren, Rt. Hon. Robert R.
Winterbotham, Hen. Selfe Page
Wyndham, Hon. H. (Sussex, W.)

Tellers for the Ayes, Mr. Sclater-Booth and Lord Robert Montagu.

Noes.

Ayrton, Acton Smee
Baines, Edward
Beaumont, H. Fred. (York, W. R.)
Bentinck, George Cavendish
Bowyer, Sir George
Candlish, John
Cavendish, Lord Edw. (Sussex, E.)
Clinton, Lord Edw. P. (Notts, N.)
Collier, Sir Robert Porrett
Cowen, Joseph
Davenport, William Bromley
Dimsdale, Robert
Elcho, Lord
Evans, Thomas William
Eykyn, Roger
Fitzwilliam, Hon. C. W. W.
Gordon, Rt. Hon. Edw. Strathearn.
Gray, Sir John (Kilkenny)
Gurney, Rt. Hon. Russell (South)
Hankey, Thomson
Heygate, Wm. Unwin (Stamford)
Ingham, Robert
Kendall, Nicholas
Leatham, Edw. Aldam (Hudders.)
Leatham, Wm. Hen. (Wakefield)
Lusk, Andrew
Morrison, Walter
O'Brien, Sir Patrick
Parry, Thomas
Peel, John (Tamworth)
Pritchard, John
Rearden, Denis Joseph
Schreiber, Charles
Severne, John Edmund
Thomson, Matt. W. (Bradford)
Vivian, Henry Hussey (Glamor.)
Waring, Charles
Wise, Henry Christopher
Wyndham, Hon. P. (Cumb. W.)

Tellers for the Noes, Mr. Thomas Cave and Mr. Headlam.

Clause 16, page 6, line 6:—Another amendment proposed, after the word "dealing," to leave out the words "nor with the retailing of arsenic, oxalic acid, cyanide of potassium, or corrosive sublimate for use in manufactures:"—(*Mr. Lowe:*)—Question put, "That the words proposed to be left out stand part of the clause:"—The Committee divided; Ayes 30, Noes 58. (See page 65.)

Ayes.

Allen, William Shepherd
Anson, Hon. Major
Ayrton, Acton Smee
Beach, W. W. Bramston (H'nts N.)
Candlish, John
Clay, James
Collier, Sir Robert Porrett
Cowen, Joseph
Eykyn, Roger
Fawcett, Henry
Forster, Charles (Walsall)
Heygate, Wm. Unwin (Stamford)
Hogg, Lt.-Col. J. Macnaghten
Howes, Edward

Hutt, Rt. Hon. Sir William
Ingham, Robert
Knatchbull-Hugessen, Edward
Lusk, Andrew
M'Laren, Duncan
Maxwell, Wellwood Herries
Mill, John Stuart
O'Beirne, James Lyster
Pritchard, John
Read, Clare Sewell
Thompson, Matt. W. (Bradford)
Whalley, George Hammond
White, Hon. Capt. Chas. (Tippe. Co.)
White, James (Brighton)
Wyndham, Hon. P. (Cumb. W.)
Wynn, Chas. W. Williams (Mont.)

Tellers for the Ayes, Lord Elcho and Mr. Waldegrave-Leslie.

Noes.

Adam, William Patrick
Booth, Sir Robert Gore
Bourne, Colonel
Brett, Sir William Baliol
Briscoe, John Ivatt
Buller, Sir Arth. Wm. (Liskeard)
Cardwell, Rt. Hon. Edward
Carter, Samuel
Cave, Rt. Hon. Steph. (New Shore.)
Cavendish, Lord G. (Derbysh. N.)
Chambers, Montagu (Devonport)
Davey, Richard (Cornwall, W.)
Dixon, George (Birmingham)
Dimsdale, Robert
Du Cane, Charles
Dyke, William Hart
Forster, Will. Edw. (Bradford)
Gaselee, Serjeant Stephen
Gordon, Rt. Hon. Edw. Strathearn
Gore, Jn. Ralph Ormbsy (Salop, N.)
Grenfell, Henry Riversdale
Guinness, Sir Arthur Edward
Hadfield, George
Hamilton, Lord Claud (Tyrone)
Hardy, Rt. Hon. Gathorne (Oxf. U.)
Henderson, John
Henley, Lord (Northampton)
Horsfall, Thomas Berry
Jervoise, Sir Jervoise Clarke
Kekewich, Samuel Trehawke
Kendall, Nicholas
Kennard, Robert William
Kingscote, Colonel
Laird, John (Birkenhead)
Liddell, Hon. Henry George
Martin, Phil. Wykeham (Rochest.)
Melly, George
Milton, Viscount
Monk, Charles James
Montagu, Rt. Hon. Lord Robert
Montgomery, Sir Graham
Powell, Francis Sharp
Ramsay, John
Rearden, Denis Joseph
St. Aubyn, John
Samuelson, Bernhard
Seely, Charles
Smith, John Abel (Chichester)
Somerset, Edward A. (Glou. Co.)
Stanley, Hon. Fred. (Preston)
Stuart, Col. Crichton (Cardiff)
Stuart, Lieut.-Col. Wm. (Bedford)
Taylor, Peter Alfred (Leicester)
Treeby, John Wright
Vivian, Capt. Hon. J. C. W. (Truro)
Walpole, Rt. Hon. Spencer Horatio
Warren, Rt. Hon. Robert R.
Wyld, James

Tellers for the Noes, Mr. Lowe and Mr. Thomas Cave.

Clause (Regulations to be observed in the sale of poisons,)—(*Lord Elcho,*) *brought up*, and read the first and second time and amended:—Another Amendment proposed, after the words "registered under this Act," to insert the words "under the written prescription of a legally qualified medical practitioner:"—(*Mr. Lowe:*)—Question put, "That those words be there inserted:"—The House *divided;* Ayes 2, Noes 14. (See page 72.)

Ayes.

Neate, Charles
Rearden, Denis Joseph

Tellers for the Ayes, Mr. Lowe and Mr. Bruce.

Noes.

Anson, Hon. Major
Beach, Sir Michael Hicks (Glos. E.)
Booth, Sir Robert Gore
Candlish, John
Chambers, Thomas (Marylebone)
Dimsdale Robert
Kinnaird, Hn. Arthur Fitzgerald
Lewis, Harvey
Lindsay, Hon. Col. Chas. (Abing.)
Locke, John

Moffatt, George — Waldegrave-Leslie, Hon. George
Surtees, Henry Edw. (Hertfords.) — Wise, Henry Christopher.
Tellers for the Noes, Lord Elcho and Mr. Ayrton.

A BILL [AS AMENDED IN COMMITTEE] INTITULED AN ACT TO REGULATE THE SALE OF POISONS, AND ALTER AND AMEND THE PHARMACY ACT, 1852.

Whereas it is expedient for the safety of the public that persons keeping open shop for the retailing, dispensing, or compounding of poisons, and persons known as Chemists and Druggists, should possess a competent practical knowledge of their business, and to that end, that from and after the day herein named all persons not already engaged in such business should, before commencing such business, be duly examined as to their practical knowledge, and that a register should be kept as herein provided, and also that the Act passed in the 15th and 16th years of the reign of her present Majesty, intituled "An Act for Regulating the Qualification of Pharmaceutical Chemists," hereinafter described as the Pharmacy Act, should be amended: be it enacted, by the Queen's Most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal and Commons in this present Parliament assembled, and by authority of the same, as follows :—

15 & 16 Vict. c. 56.

Persons selling or compounding Poisons, or assuming the title of Chemist and Druggist, to be qualified.

1. From and after the 31st day of December, 1868, it shall be unlawful for any person to sell or keep open shop for retailing, dispensing, or compounding poisons, or to assume or use the title "Chemist and Druggist" or Chemist or Druggist, or Pharmacist, or Dispensing Chemist, or Druggist, in any part of Great Britain, unless such person shall be a Pharmaceutical Chemist, or a Chemist and Druggist within the meaning of this Act, and be registered under this Act, and conform to such regulations as to the keeping, dispensing, and selling of such poisons as may from time to time be prescribed by the Pharmaceutical Society with the consent of the Privy Council.

Poisons within the meaning of Act.

2. The several articles named or described in the Schedule A shall be deemed to be Poisons within the meaning of this Act, and the Council of the Pharmaceutical Society of Great Britain (hereinafter referred to as the Pharmaceutical Society) may from time to time, by resolution, declare that any article in such resolution named ought to be deemed a poison within the meaning of this Act; and thereupon the said Society shall submit the same for the approval of the Privy Council, and if such approval shall be given, then such resolution and approval shall be advertised in the "London and Edinburgh Gazettes," and on the expiration of one month from such advertisement the article named in such resolution shall be deemed to be a poison within the meaning of this Act.

Chemists and Druggists within meaning of Act.

3. Chemists and Druggists within the meaning of this Act shall consist of all persons who, at any time before the passing of this Act, have carried on, in Great Britain, the business of a Chemist and Druggist, in the keeping of open shop for the compounding of the prescriptions of duly qualified medical practitioners, also of all Assistants and Associates who, before the passing of this Act, shall have been duly registered under or according to the provisions of the Pharmacy Act, and also of all such persons as may be duly registered under this Act.

Assistants to be registered.

4. Any person who, at the time of the passing this Act, shall be of full age, and shall produce to the Registrar on or before the 31st day of December, 1868, certificates, according to the Schedule E to this Act, that he had been for a period of not less than three years actually engaged and employed in the dispensing and compounding of prescriptions as an assistant to a Pharmaceutical Chemist, or to a Chemist and Druggist as defined by Clause 3 of this Act, shall, on passing such a modified examination as the Council of the Pharmaceutical Society with the consent of the Privy Council may declare to be sufficient evidence of his skill and competency to conduct the business of a Chemist and Druggist, be registered as a Chemist and Druggist under this Act.

Registration of Chemists and Druggists.

5. The persons who at the time of the passing of the Act shall have been duly admitted Pharmaceutical Chemists, or shall be Chemists and Druggists within the meaning of the Act, shall be entitled to be registered under the Act without paying any fee for such registration: Provided, however, as regards any such Chemist and Druggist, that his claim to be registered must be by notice in writing, signed by him and given to the Registrar with certificates according to the Schedules (C) and (D) to this Act; and provided also, that for any such registration of a Chemist and Druggist, unless it be duly claimed by him on or before the 31st day of December, 1868, the person registered shall pay the same fee as persons admitted to the Register after examination under this Act.

Examiners under Pharmacy Act to be the Examiners under this Act.

6. All such persons as shall from time to time have been appointed to conduct examinations under the Pharmacy Act, shall be, and are hereby declared to be examiners for the purposes of this Act, and are hereby empowered and required to examine all such persons as shall tender themselves for examination under the provisions of this Act, and every person who shall have been examined by such examiners, and shall have obtained from them a certificate of competent skill and knowledge and qualification, shall be entitled to be registered as a Chemist and Druggist under this Act, and the examination aforesaid shall be such as is provided under the Pharmacy Act for the purposes of a qualification to be registered as Assistant under that Act, or as the same may be varied from time to time by any Bye-law to be made in accordance with the Pharmacy Act as amended by this Act: provided that no person shall conduct any examination for the purposes of this Act until his appointment has been approved by the Privy Council; and such appointment and approval shall not in any case be in force for more than five years; moreover, it shall be the duty of the said Pharmaceutical Society to allow any officer appointed by the said Privy Council to be present during the progress of any examination held for the purposes of this Act.

Certificate of competent skill, etc.

Application of fees to purpose of Pharmaceutical Society.

7. Upon every such examination and registration as aforesaid such fees shall be payable as shall from time to time be fixed and determined by any Bye-law, to be made in accordance with the Pharmacy Act as amended by this Act, and shall be paid to the Treasurer of the said Society for the purposes of the said Society.

Registrar under Pharmacy Act to be Registrar under this Act.

8. The registrar appointed, or to be appointed, under or by virtue of the Pharmacy Act, shall be registrar for the purposes of this Act.

Council of Pharmaceu-

9. The Council of the Pharmaceutical Society shall, with all convenient speed, after the passing of this Act, and from time to time, as occasion may require, make orders or regulations for regulating

tical Society to make orders for regulating Register to be kept.

the register, to be kept under this Act as nearly as conveniently may be in accordance with the form set forth in the Schedule B to this Act, or to the like effect, and such register shall be called the Register of Chemists and Druggists.

Duty of Registrar to make and keep Register.

10. It shall be the duty of the Registrar to make and keep a correct register, in accordance with the provisions of this Act, of all persons who shall be entitled to be registered under this Act, and to erase the names of all registered persons who shall have died, and from time to time to make the necessary alterations in the addresses of the persons registered under this Act; to enable the Registrar duly to fulfil the duties imposed upon him, it shall be lawful for the Registrar to write a letter to any registered person, addressed to him according to his address on the register, to inquire whether he has ceased to carry on business or has changed his residence,—such letter to be forwarded by post as a registered letter, according to the Post-Office regulations for the time being, and if no answer shall be returned to such letter within the period of six months from the sending of the letter, a second, of similar purport, shall be sent in like manner, and if no answer be given thereto within three months from the date thereof, it shall be lawful to erase the name of such person from the register, provided always that the same may be restored by direction of the Council of the Pharmaceutical Society, should they think fit to make an order to that effect.

Notice of death of Pharmaceutical Chemist or Chemist and Druggist to be given by Registrars.

11. Every Registrar of Deaths in Great Britain, on receiving notice of the death of any Pharmaceutical Chemist, or Chemist and Druggist, shall forthwith transmit, by post, to the Registrar under the Pharmacy Act, a certificate, under his own hand, of such death, with the particulars of the time and place of death, and on the receipt of such certificate, the said Registrar under the Pharmacy Act shall erase the name of such deceased Pharmaceutical Chemist, or Chemist and Druggist, from the register, and shall transmit to the said Registrar of deaths the cost of such certificate and transmission, and may charge the cost thereof as an expense of his office.

Evidence of qualification to be given before registration.

12. No name shall be entered in the register, except of persons authorized by this Act to be registered, nor unless the Registrar be satisfied by the proper evidence, that the person claiming is entitled to be registered; and any appeal from the decision of the Registrar may be decided by the Council of the Pharmaceutical Society; and any entry which shall be proved to the satisfaction of such Council to have been fraudulently or incorrectly made, may be erased from or amended in the Register, by order, in writing, of such Council.

Annual Register to be published and be evidence.

13. The Registrar shall, in the month of January in every year, cause to be printed, published, and sold, a correct register of the names of all Pharmaceutical Chemists, and a correct register of all persons registered as Chemists and Druggists, and in such registers, respectively, the names shall be in alphabetical order, according to the surnames, with the respective residences, in the form set forth in Schedule B to this Act, or to the like effect, of all persons appearing on the Register of Pharmaceutical Chemists, and on the Register of Chemists and Druggists, on the 31st day of December last preceding, and such printed registers shall be called 'The Registers of Pharmaceutical Chemists and Chemists and Druggists,' and a printed copy of such registers for the time being, purporting to be so printed and published as aforesaid, or any

certificate under the hand of the said Registrar, and countersigned by the President or two Members of the Council of the Pharmaceutical Society, shall be evidence in all Courts and before all Justices of the Peace and others, that the persons therein specified are registered according to the provisions of the Pharmacy Act or of this Act, as the case may be, and the absence of the name of any person from such printed register shall be evidence, until the contrary shall be made to appear, that such person is not registered according to the provisions of the Pharmacy Act or of this Act.

Penalty on wilful falsification of Register, or for obtaining registration by false representation.

14. Any Registrar who shall wilfully make or cause to be made any falsification in any matter relating to the said registers, and any person who shall wilfully procure or attempt to procure himself to be registered under the Pharmacy Act or under this Act, by making or producing or causing to be made or produced any false or fraudulent representation or declaration, either verbally or in writing, and any person aiding or assisting him therein, shall be deemed guilty of a misdemeanour in England, and in Scotland of a crime or offence punishable by fine or imprisonment, and shall on conviction thereof be sentenced to be imprisoned for any term not exceeding twelve months.

Protection of titles and restrictions on sale of poisons.

15. From and after the 31st day of December, 1868, any person who shall sell, or keep an open shop for the retailing, dispensing, or compounding poisons, or who shall take, use, or exhibit the name or title of Chemist and Druggist or Chemist or Druggist, not being a duly registered Pharmaceutical Chemist or Chemist and Druggist, or who shall take, use, or exhibit, the name or title Pharmaceutical Chemist or Pharmaceutist or Pharmacist, not being a Pharmaceutical Chemist, or shall fail to conform with any regulation as to the keeping or selling of poisons, made in pursuance of this Act, or who shall compound any medicines of the British Pharmacopœia, except according to the formularies of the said Pharmacopœia, shall, for every such offence, be liable to pay a penalty or sum of five pounds, and the same may be sued for, recovered, and dealt with in the manner provided by the Pharmacy Act for the recovery of penalties under that Act; but nothing in this Act contained shall prevent any person from being liable to any other penalty, damages, or punishment, to which he would have been subject if this Act had not passed.

Reserving rights of certain persons.

16. Nothing hereinbefore contained shall extend to or interfere with the business of any legally qualified apothecary or of any member of the Royal College of Veterinary Surgeons of Great Britain, nor with the making or dealing in patent medicines, nor with the business of wholesale dealers in supplying poisons in the ordinary course of wholesale dealing; and upon the decease of any Pharmaceutical Chemist or Chemist and Druggist actually in business at the time of his death, it shall be lawful for any executor, administrator, or trustee of the estate of such Pharmaceutical Chemist or Chemist and Druggist to continue such business if and so long only as such business shall be *bonâ fide* conducted by a duly qualified Assistant; and a duly qualified assistant, within the meaning of this clause, shall be a Pharmaceutical Chemist or a Chemist and Druggist registered by the Registrar under the Pharmacy Act or this Act; provided always, that registration under this Act shall not entitle any person so registered to practise medicine or surgery, or any branch of medicine or surgery.

Sale of Poisons.

17. It shall be unlawful to sell any poison, either by wholesale or by retail, unless the box, bottle, vessel, wrapper, or cover in which

Poisons to be distinctly labelled.

such poison is contained, be distinctly labelled with the name of the article and the word poison, and with the name and address of the seller of the poison; and it shall be unlawful to sell any poison of those which are in the first part of schedule (A) to this Act, or may hereafter be added thereto under section 2 of this Act, to any person unknown to the seller, unless introduced by some person known to the seller, and on every sale of any such article the seller shall, before delivery, make or cause to be made an entry in a book to be kept for that purpose, stating, in the form set forth in schedule (F) to this Act, the date of the sale, the name and address of the purchaser, the name and quantity of the article sold, and the purpose for which it is stated by the purchaser to be required, to which entry the signature of the purchaser and of the person, if any, who introduced him, shall be affixed; and any person selling poison otherwise than is herein provided, shall, upon a summary conviction before two Justices of the Peace in England or the Sheriff in Scotland, be liable to a penalty not exceeding five pounds for the first offence, and to a penalty not exceeding ten pounds for the second or any subsequent offence; and for the purposes of this section the person on whose behalf any sale is made by any apprentice or servant shall be deemed to be the seller, but the provisions of this section, which are solely applicable to poisons in the first part of the schedule (A) to this Act, or which require that the label shall contain the name and address of the seller, shall not apply to articles to be exported from Great Britain by wholesale dealers, nor to sales by wholesale to retail dealers in the ordinary course of wholesale dealing, nor shall any of the provisions of this section apply to any medicine supplied by a legally qualified apothecary to his patient, nor apply to any article when forming part of the ingredients of any medicine dispensed by a person registered under this Act, provided such medicine be labelled in the manner aforesaid with the name and address of the seller, and the ingredients thereof be entered, with the name of the person to whom it is sold or delivered, in a book to be kept by the seller for that purpose, and nothing in this Act contained shall repeal or affect any of the provisions of an Act of the Session holden in the fourteenth and fifteenth years of the reign of her present Majesty, intituled 'An Act to regulate the Sale of Arsenic.'

Penalty on omissions.

14 & 15 Vict. c. 13.

Chemists and Druggists in business prior to passing of Act eligible for election as Members of Pharmaceutical Society.

18. Every person who, at the time of the passing of this Act, is or has been in business on his own account as a Chemist and Druggist as aforesaid, and who shall be registered as a Chemist and Druggist, shall be eligible to be elected and continue a member of the Pharmaceutical Society according to the Bye-laws thereof; but no person shall, in right of membership acquired pursuant to this clause, be placed on the Register of Pharmaceutical Chemists, nor, save as is hereinafter expressly provided, be eligible for election to the Council of the Pharmaceutical Society.

Council of Pharmaceutical Society.

19. Every person who is or has been in business on his own account as a Chemist and Druggist as aforesaid at the time of the passing of this Act, and who shall become a Member of the Pharmaceutical Society, shall be eligible for election to the Council of the Pharmaceutical Society; but the said Council shall not at any time contain more than seven Members who are not on the Register of Pharmaceutical Chemists.

Persons registered under

20. Every person who shall have been registered as a Chemist and Druggist under this Act, by reason of having obtained a certificate of qualification from the Board of Examiners, shall be eligible to be

elected an Associate of the Pharmaceutical Society, and every such person so elected and continuing as such Associate, being in business on his own account, shall have the privilege of attending all meetings of the said Society and of voting thereat, and otherwise taking part in the proceedings of such meetings, in the same manner as Members of the said Society; provided always, that such Associates contribute to the funds of the said Society the same Fees or Subscriptions as Members contribute for the time being under the Bye-laws thereof.

Clause 4 and Clause 6, eligible to be elected Associates, and being in business, have the privilege of voting in the Society, on paying the same subscriptions as Members.

21. At all meetings of the Pharmaceutical Society at which votes shall be given for the election of officers, all or any of the votes may be given either personally or by voting-papers, in a form to be defined in the Bye-laws of the said Society, or in a form to the like effect, such voting-papers being transmitted under cover to the Secretary, not less than one clear day prior to the day on which the election is to take place.

Voting-papers for election of Council.

22. And whereas by the Charter of Incorporation of the said Pharmaceutical Society it is provided that the Council of the said Society shall have the sole control and management of the real and personal property of the said Society, subject to the Bye-laws thereof, and shall make provision thereout, or out of such part thereof as they shall think proper for the relief of the distressed Members or Associates of the said Society, and their widows and orphans, subject to the regulations and Bye-laws of the said Society. And whereas, for extending the benefits which have resulted from the said provision in the said Charter of Incorporation, it is desirable that additional power should be granted to the said Council, be it enacted that from and after the passing of this Act, the said Council may make provision out of the real and personal property aforesaid, and out of any special fund, known as the Benevolent Fund, not only for the relief of the distressed Members or Associates of the said Society and their widows and orphans, subject to the said regulations and Bye-laws, but also for all persons who may have been and have ceased to be Members or Associates of the said Society, or who may be or have been duly registered as "Pharmaceutical Chemists" or "Chemists and Druggists," and the widows and orphans of such persons, subject to the regulations and Bye-laws of the said Society.

Benevolent Fund may be applied to past Members and Associates, also to Pharmaceutical Chemists and registered Chemists and Druggists.

23. Persons registered under 'The Medical Act' shall not be or continue to be registered under this Act.

Registration under Medical Act.

24. The provisions of the Act of the twenty-third and twenty-fourth of Victoria, chapter eighty-four, intituled "An Act for Preventing the Adulteration of Articles of Food or Drink," shall extend to all articles usually taken or sold as medicines, and every adulteration of any such article shall be deemed an admixture injurious to health; and any person registered under this Act, who sells any such article adulterated, shall, unless the contrary be proved, be deemed to have knowledge of such adulteration.

Adulteration of Food or Drink Act to extend to Medicines.

25. On and after the passing of this Act, all powers vested by the Pharmacy Act in one of her Majesty's Principal Secretaries of State, shall be vested in the Privy Council, and the seventh section of the Public Health Act, 1858, shall apply to all proceedings and acts of the Privy Council herein authorized.

Acts of Privy Council.

26. The Privy Council may direct the name of any person who is convicted of any offence against this Act, which, in their opinion, renders him unfit to be on the register under this Act, to be erased from such register; and it shall be the duty of the registrar to erase the same accordingly.

Power to erase name from Register.

27. This Act shall not extend to Ireland.
28. This Act may be cited as the Pharmacy Act, 1868. Short Title.

SCHEDULE A.

Part 1.

Arsenic and its preparations.
Prussic Acid.
Cyanides of Potassium and all metallic cyanides.
Strychnine, and all poisonous vegetable alkaloids and their salts.
Aconite and its preparations.
Emetic Tartar.
Corrosive Sublimate.
Cantharides.
Savin and its Oil.
Ergot of Rye and its preparations.

Part 2.

Oxalic Acid.
Chloroform.
Belladonna and its preparations.
Essential Oil of Almonds, unless deprived of its Prussic Acid.
Opium and all preparations of Opium or of Poppies.

SCHEDULE B.

Name.	Residence.	Qualification.
A. B.	Oxford Street, London.	In business prior to Pharmacy Act, 1868.
C. D.	George Street, Edinburgh.	Examined and certified.
E. F.	Cheapside, London.	Assistant prior to Pharmacy Act, 1868.

SCHEDULE C.

Declaration by a person who was in business as a Chemist and Druggist in Great Britain before the Pharmacy Act, 1868.

To the Registrar of the Pharmaceutical Society of Great Britain.

I, , residing at , in the county of , hereby declare that I was in business as a Chemist and Druggist in the keeping of open shop for the compounding of the prescriptions of duly qualified medical practitioners at , in the county of , on or before the day of , 186 .

Signed (Name.)

Dated this day of , 18 .

SCHEDULE D.

Declaration to be signed by a duly qualified Medical Practitioner, or Magistrate, respecting a person who was in business as a Chemist and Druggist in Great Britain before the Pharmacy Act, 1868.

To the Registrar of the Pharmaceutical Society of Great Britain.

I residing at , in the county of , hereby declare that I am a duly qualified Medical Practitioner [*or* Magistrate], and that to my knowledge , residing at in the county of , was in business as a Chemist and Druggist, in the keeping of open shop for the compounding of the prescriptions of duly qualified Medical Practitioners, before the day of , 186 .

(*Signed*)

SCHEDULE E.

Declarations to be signed by and on behalf of any Assistant claiming to be registered under the Pharmacy Act, 1868.

To the Registrar of the Pharmaceutical Society of Great Britain.

I hereby declare that the undersigned , residing at , in the county of , had for three years immediately before the passing of the Pharmacy Act, 1868, been employed in dispensing and compounding prescriptions, as an Assistant to a Pharmaceutical Chemist or Chemist and Druggist, and attained the age of twenty-one years.

As witness my hand, this day of 186 .

A. B., duly qualified Medical Practitioner.
C. D., Pharmaceutical Chemist.
E. F., Chemist and Druggist.
G. H., Magistrate.

(*To be signed by one of the four parties named.*)

I hereby declare that I was an Assistant to of in the county of in the year , and was for three years immediately before the passing of this Act actually engaged in dispensing and compounding prescriptions, and that I had attained the full age of twenty-one years at the time of the passing of the Pharmacy Act, 1868.

N. O., Assistant.

SCHEDULE F.

Date.	Name of Purchaser.	Name and Quantity of Poison sold.	Purpose for which it is required.	Signature of Purchaser.	Signature of Person introducing Purchaser.

BRITISH PHARMACEUTICAL CONFERENCE.

FIFTH ANNUAL MEETING.—1868.

The following letter has been forwarded to the members of the British Pharmaceutical Conference. A large and interesting meeting is expected.

"Sir,—The meeting for the present year will be held during the third week in August at Norwich, at the Lecture Hall, St. Andrew's, under the presidency of Mr. Daniel Hanbury, F.R.S. On Monday, the 17th of August, an exhibition of apparatus, preparations, and materials strictly connected with pharmacy, will be opened and continued during the week. On Tuesday, at 10 A.M., the president will deliver an address: the reading and discussion of papers on pharmaceutical subjects will then commence, be continued in the afternoon till 4.30, and be carried on during Wednesday; an adjournment from 12.30 till 2.0 taking place each day.

"Members intending to be present are requested to communicate with the local secretary, Mr. F. Sutton, F.C.S., Bank Plain, Norwich, who will give all information concerning hotel accommodation, etc.

"Norwich is an ancient and important city, containing 80,000 inhabitants. Its cathedral, chiefly Norman, dates back to 1096. The castle, the churches, the Guildhall, St. Andrew's Hall, many quaint, picturesque buildings, and the geological features and archæological remains in the surrounding district, combine to render Norwich an interesting city. The museum is celebrated for its ornithological collection, which is one of the best in the kingdom. The British Association for the Advancement of Science will also hold its meetings at Norwich during the third and fourth weeks of August.

"If you are engaged upon any investigation, we may remind you that papers are expected to be sent in to the secretaries at least fourteen days before the annual meeting, accompanied by a short abstract for insertion in the local and other newspapers.

"Should you be disposed to accept any of the unaccepted subjects suggested for investigation in the list sent to you in the early part of the year; work on any subject suggested by yourself; propose any subject for investigation by others; forward for analysis specimens of drugs and chemicals whose examination might tend to throw light on the question of adulterations and impurities; propose the recognition of any pharmaceutical association and reception of its delegates by the Conference; or make any suggestions or propositions;—we shall be glad to receive and announce the same at the meeting.

"In addition to the ways just mentioned of aiding the great design of the Conference—the advancement of Pharmacy—we trust you will be able to send us the names of gentlemen whom you may desire to propose as members. Every chemist and druggist is obviously concerned in the progress of pharmacy, and should therefore join this Association, even if only for the aid afforded by his annual subscription. A form of application for membership is annexed, which we hope you may be able to fill up. We shall be glad to send you any number of the forms, and also copies of a letter of invitation to membership, explaining the origin and objects of the Conference, and, except your signature, ready for transmission to any of your friends.

"We trust you may be present at the meeting,

"And are, Sir, yours faithfully,

"J. Attfield, } *Honorary*
"R. Reynolds, } *General Secretaries.*"

ORIGINAL AND EXTRACTED ARTICLES.

ON MR. WOOD'S PAPER UPON LIQUOR BISMUTHI ET AMMONIÆ CITRATIS.

BY G. F. SCHACHT.

In my last communication, published in the April number of this Journal, I declared my intention to refer more particularly to the efficiency of the Pharmacopœia process for the purification of bismuth from arsenic, as soon as I had found leisure to repeat and extend some of my old experiments.

I have now completely satisfied myself upon the point. I find the process in this respect to be certainly more useful than for the removal of copper, but, to say the best of it, to be somewhat limited in its value. Amongst other conditions of uncertainty, its success depends much upon the quantities operated upon. When these are small, as for instance, 1000 grs. of the metal, the process, with much care as to temperature, and efficiency of stirring, succeeds well; the loss of bismuth is large, but what remains is free from arsenic. When the exact quantities of the Pharmacopœia are employed, viz. 10 oz. of the metal, the arsenic is *not* entirely removed, and when as much as 10 lbs. are operated upon, the proportion of arsenic retained in the metal is considerable.

I may as well state the plan I adopted for the detection of the arsenic was, to fuse 100 grs. of the sample with 200 grs. of pure zinc, and to pass the hydrogen generated from this mixture through a narrow German glass tube, heated to redness for half an hour. But I also found the combustion of the gas on a cold white plate sufficiently delicate for the purpose.

So much in answer to Mr. Wood's original paper. Since that was published, however, the Editor of the Pharmaceutical Journal has entered the controversy, Mr. Wood has published a second paper, and two notes on the subject have been presented by Mr. Ekin, of Bath.

Mr. Ekin's first communication, though short, is very important. He finds experimentally, and as a matter of fact, what my advertisement indicated as the probable result of an imperfect process. He examined several samples of the Pharmacopœia "Liquor Bismuthi et Ammoniæ Citratis," procured from good wholesale houses, and found them "*all contaminated with arsenic.*" His paper of June refers to the prevailing impurities of the metal bismuth, and to the inefficiency of the Pharmacopœia process for their removal. Mr. Ekin is a perfectly independent witness, and his testimony is a complete endorsement of my statements.

Mr. Wood, finding it difficult to defend his original position, that fusion with nitre will remove the copper from bismuth, now follows the lead of the Editor of this Journal, who appears to think he completely settles the matter by reminding me, in an editorial parenthesis, that "copper is precluded by the Pharmacopœia tests." In passing, I may perhaps be permitted the opinion, that it would have been more fair, and—shall I say?—more courteous, to have allowed my answer to Mr. Wood to appear as I wrote it, unaccompanied by the embellishment of an editorial criticism. As, however, the Editor has chosen to pronounce an opinion even before the argument was concluded, I may fairly press him for something more. I do not for a moment suppose that he too believes that if "the fusion with nitre be carried on sufficiently long" the copper can be removed from the bismuth, except perhaps in the sense that if we look at the lion on Northumberland Gate *sufficiently long* we shall see him wag his tail. I therefore venture to suggest it would have been more worthy the reputation of a master of chemistry, and much more beneficial to his readers, to

have offered some remedy for a proved defect in a process for which he is supposed to be in part answerable, than to have contented himself with advancing the singularly illogical assertion that "it is precluded by the test." How can a test applied after a process in any way influence the result of that process? All the test is worth is to show whether the process has been successful,—and so applied in the present case the answer must be—no! The fact is, the closer the Pharmacopœia treatment of this subject is examined, the more complete is the jumble seen to be. Under the heading "Bismuth" we are informed that it is "a crystalline metal and generally impure." This is somewhat laconic, but, all will admit, not very instructive. What the impurities are likely to be, the authorities, possibly for the best of all reasons, forbear to tell us. We are then directed to convert this impure "Bismuthum" into "Bismuthum Purum" by a definite process, and certain characters and tests are given to which the result is required to answer. Now it unfortunately happens that these characters and tests bear no relation whatever to the process: they all apply equally well or ill to the *unpurified* as to the *purified* metal; whilst, on the other hand, the tests that might have been fairly introduced as applicable to a metal that has passed through the process are altogether wanting. Surely this may be fairly called a jumble, at any rate there is a defect, and for this defect I venture to ask the Editor, since he has voluntarily joined the discussion, if he can suggest a remedy. Can he give us a good metallurgical process for the separation of copper from bismuth?

Lest either he or Mr. Wood should feel inclined to repeat the insinuation that I exaggerate the frequency and the importance of the copper contamination of bismuth, I may perhaps be excused the following bit of personal experience. I find, by reference to my books, that since January, 1863, I have purchased bismuth on thirty-eight different occasions, in quantities varying from 7 lbs. to 30 lbs. I have always given the top market price for the best I could get, and have purchased of the most respectable refiners of London and Birmingham, and I have not found three of these samples free from copper. On the contrary, the contamination has been a systematic inconvenience to me, and on several occasions has been so excessive as to render the sample quite unfit for conversion into "Liquor Bismuthi." With such experience, it was simply impossible I could fail to detect the fundamental error of the Pharmacopœia process for the preparation of its "Liquor." Knowing it so well to be a difficult metal to obtain pure, and seeing that this process must of necessity include all the soluble impurities of the particular sample, it was, I believed, my simple duty to direct professional attention to the probable consequences.

I believe every candid person who may read this discussion will hold the assertions of my advertisement to have been completely justified. In the strictest scientific sense, they merely required the admission of possible exceptions —whilst, as a commercial statement, which was all they pretended to be, they were founded upon large experience.

[The above paper was in type for the July number, but in consequence of press of matter was omitted.]

ON THE PURIFICATION OF BISMUTH.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Sir,—Independent of any knowledge of Mr. Ekin's experiments, my attention has been given for some time to the purification of bismuth. Four out of six specimens of commercial bismuth I have found containing copper as an

impurity; so far I agree with the B. P. definition:—"Commercial bismuth" . . . "it is generally impure."

That copper is found in most specimens of commercial bismuth has been known some time. Parrish, in his 'Practical Pharmacy,' 1859, says, "It (bismuth) generally contains both arsenic and copper," and Draper, in his 'Review of the Dublin Exhibition,' asks the question, "Why is it so difficult to obtain bismuth free from copper?" (Pharm. Journ. Aug. 1865, p. 56.) I purified (?) my specimens by the B. P. process, but copper still remained even when favoured with an extra dose of nitre-fusion.

The fault I find with the B. P. process is, that a test recognizes copper as a possible impurity, and one not to remain in the purified metal, but the process of purification given is incapable of removing it.

I do not think it necessary in a Pharmacopœia to require absolute chemical purity in all its preparations; but when substances are poisonous or alter the physical characters of the preparations, they should be removed and an officinal process should correspond with its published tests.

The precipitation of the nitric solution of bismuth by water separates bismuth from copper, silver, iron, etc., but recent experiments of Dr. Guming show that arsenic is thrown down in the precipitation. Dr. Guming recommends diluting the nitric solution of bismuth with sufficient water to cause a slight precipitate; this precipitate, he says, is arsenico-nitrate of bismuth, which is less soluble than the basic nitrate of bismuth. When the solution is clear, decant and finish the precipitation with water in the usual way. There is here a waste of bismuth in two ways, first, precipitated with the arsenic, and, secondly, still dissolved in water as bismuth pernitrate. Dr. Guming purifies the first from arsenic by boiling in liq. sodæ, but leaves the second unnoticed (*vide* 'Chemical News,' May 29, 1868).

Would not precipitating the nitric solution by carbonate of ammonia, washing the precipitate with liq. ammoniæ, and reduction, be an easier and more economical plan?

I am Sir, yours, etc.,
G. Brownen.

NOTE ON METALLIC BISMUTH, AND LIQUOR BISMUTHI ET AMMONIÆ CITRATIS.

BY DR. REDWOOD.

The vicissitudes which have attended the commerce of bismuth for several years past have produced an unfavourable influence on the condition, in regard to purity, of some of the preparations of bismuth which are used in medicine. The price of the metal has undergone great fluctuations, ranging from 2*s.* 6*d.* to more than 20*s.* a pound; and, although the highest prices to which it has thus attained have been unprecedented in its previous history, the proportion of impure bismuth in the market has, at the same time, been unusually large. This unsatisfactory state of things appears to have arisen from a falling off in the supply of bismuth from those localities whence the best samples have been obtained, while new sources of supply, especially the Australian, have yielded the metal in a state in which its purification has been attended with considerable difficulty. Of the impurities most commonly occurring, arsenic, lead, copper, and silver are the most important. The bismuth may be freed from the first two of these, if present, with comparative ease, by a simple metallurgical operation which consists in fusing it with nitre, as directed in the Pharmacopœia. This is the process usually adopted, and which answers best for re-

moving the more oxidizable metals. It may be conveniently and successfully applied to quantities of the metal varying from four ounces to a pound by means of a gas furnace. The process, however, is insufficient for the removal of copper and silver; and it is with reference especially to the former of these that the principal difficulty is experienced in purifying some of the crude bismuth and bismuth ores of commerce. At the present time large quantities of Australian ore, rich in copper, are waiting the discovery of a method by which the bismuth it contains may be economically separated in a state of sufficient purity to admit of its being used for pharmaceutical purposes. When this question has been satisfactorily solved, there is every reason to believe that a great reduction in the price of the metal will take place. In the mean time we shall have much impure bismuth, containing copper, which, although applicable for one of the purposes for which bismuth is required,—namely, the preparation of fusible metal,—is not well suited for the production of the compounds of bismuth used in medicine. Already the attention of metallurgists has been directed to the importance of providing a supply of purified bismuth for pharmaceutists, and I am assured by houses extensively engaged in this branch of metallurgy that bismuth, free from arsenic, copper, or any material impurity, may now be obtained by those who are willing to pay the price for it.* As this purified bismuth is prepared by men accustomed to such operations from the ores which yield it most readily, it will be found the most economical and best course for those who require pure bismuth to buy the metal in the purified state, or otherwise it will be necessary, in applying the process of the Pharmacopœia, to use crude bismuth which is free from copper and silver.

With reference to *Liquor Bismuthi et Ammoniæ Citratis*, on which there has been some correspondence in this Journal, it may be stated that, if the conditions specified in the Pharmacopœia be fulfilled, that is to say, if the bismuth employed has been purified in the manner described, and if the purified metal, and also the solution prepared from it, answer to the tests as given, the latter will be free from *arsenic*, *lead*, *copper*, and *silver*. These are the impurities most likely to occur, and to the removal or detection of which the process of purification and the tests of the Pharmacopœia are directed; but if it were the object of a manufacturer to introduce other impurities which would elude detection by the tests as given, it would no doubt be possible to do so. I have recently met with two instances of such adulteration in subnitrate of bismuth, an account of which will be found in the following article.

NOTE ON A NEW ADULTERATION OF SUBNITRATE OF BISMUTH.

BY DR. REDWOOD.

I have recently had occasion to examine two samples of subnitrate of bismuth, which have proved to be adulterated to a great extent, by the admixture of a substance which none of the tests usually applied would detect. These samples were sent for examination by wholesale druggists who had been led to suspect that they were not genuine, but who were greatly surprised to learn the extent and nature of the adulteration.

The first of the samples was sent me last May. It presented the usual appearance of the variety of subnitrate of bismuth generally met with in commerce in the form of powder, without any crystalline character. It dissolved in nitric

* I have recently purchased such at 20*s*. a pound, the price of crude bismuth being at the same time 18*s*. a pound.

acid with a slight evolution of carbonic acid gas, and this had caused it to be condemned as impure, by a customer to whom it had been sent. The quantity of carbonate present in it was, however, extremely small. In other respects it answered to the Pharmacopœia tests, excepting that the solution in nitric acid gave a precipitate with nitrate of silver indicating the presence of oxychloride. This is so frequently met with in commercial subnitrate of bismuth that its detection would not have excited much surprise. Its presence is excused by manufacturers on the ground of its making the powder more suitable for some of the purposes to which it is applied, so that for such purposes the powder would be unsaleable if it did not contain any chloride. The chlorine having been estimated, and the equivalent quantity of oxychloride calculated therefrom, a further examination rendered it evident that there was something else present besides subnitrate of bismuth. The residue left, after calcination, was in excess of that which theory indicated; and this residue dissolved in nitric acid, mixed with dilute acetic acid, and precipitated with sulphuretted hydrogen, gave an amount of sulphide much below the theoretical quantity. The cause of these discrepancies was found in the filtrate, which yielded an abundant precipitate of phosphate of lime.

While I was engaged in this investigation, my attention was directed to a paper in the 'Journal de Pharmacie et de Chimie' for last March, by Mr. Roussin, in which he alludes to the adulteration of subnitrate of bismuth with phosphate of lime, and describes a very simple method of detecting it. Mr. Roussin says that in one case he found as much as 28 per cent. of phosphate of lime in a sample which presented the usual appearance and answered to the ordinary tests of subnitrate of bismuth. His process for its detection and estimation is as follows:—Dissolve equal quantities of the subnitrate and of tartaric acid in nitric acid slightly diluted with water, and add to this a strong solution of carbonate of potash until all effervescence has ceased, and the liquid is rendered strongly alkaline. "If the subnitrate of bismuth be pure the liquid will be clear, and will remain so even after it has been boiled, but if the sample of subnitrate submitted to the test should contain phosphate of lime, even to the extent of 1 or 2 per cent., this will form a white precipitate, which will not dissolve with long-continued boiling."

In applying this test, it is important to observe that the phosphate of lime, even when present in large quantity, is not precipitated in the first instance after the addition of the carbonate of potash, but its precipitation is immediately effected by boiling the solution. From the sample to which I have already referred, I obtained in this way 11 per cent. of phosphate of lime, and from another sample, which came from a different source, I have more recently obtained no less than 40 per cent. of the same adulterant.

I have reason to believe that both these samples were of foreign manufacture.

ON THE VEGETABLE PRODUCTS USED BY THE NORTH-WEST AMERICAN INDIANS AS FOOD AND MEDICINE, IN THE ARTS, AND IN SUPERSTITIOUS RITES.

BY ROBERT BROWN, F.R.G.S., ETC.

On ransacking my various journals and notebooks, relating to North-west America, I find scattered through them many notices of the economic plants of the aborigines of these countries. Though these memoranda can be of but little use to civilized art or medicine, yet I have thrown them together as contributions to the economic history of plants and the ethnology of a little-known

people. The country is, however, very extensive, and therefore much must be omitted, as there are numerous plants and vegetable products used by some of the tribes which I have never visited and of which I know nothing, except by uncertain hearsay. The following notes, therefore, principally relate to my own observations and chiefly to the Indians on the Pacific seaboard. These Indians are not much of a phytophagous people. The tribes in the interior live by hunting, and those on the banks of great rivers, such as the Fraser and Columbia, chiefly by fishing, so that they only resort to vegetable diet as an addition to their ordinary food, or as a corrective to the unvarying meals of flesh and fish, chiefly venison and salmon. It is only the miserable "Digger Indians"—the *gens de pitié* of the *voyageurs*—who can be said to subsist to any great extent on vegetable food, varying it with grubs, snakes, lizards, and grasshoppers, the latter of which they devour as eagerly as do the Bedouins of the Eastern deserts.

1. *Food.*—Nearly all of the tribes from the coast to the Rocky Mountains, use as food more or less of the blue lily,—the *gamass* or *la gamass** of the *voyageurs* (*Gamassia esculenta*, Lindl.),—which, in the spring, lends a characteristic aspect to the Western Pacific prairies and open grounds. In Vancouver Island the *gamass* comes into flower about the middle or end of April, and remains in bloom until June, when, just as it is fading, the roots are in a condition to be gathered,—until that time it is watery and unpalatable; if delayed longer, it fades away, and it would be impossible to find the *locale* of the root. The gathering is nearly wholly done by women and children, who use a sharp-pointed stick for the purpose, and it is surprising to see the aptitude with which the root is dug out. A botanist who has attempted the same feat with his spade will appreciate their skill. About this period the Indians come from their permanent villages, and encamp under the shade of trees in little brush camps. It is the time when, away from the filth of villages, Indian life appears in its most picturesque aspect, and the twinkling of the *gamass* camp-fires, as you pass through the woods at night, have a very pleasing aspect. To the *gamass* gathering come sober-minded young hunters and salmon-fishers to select a partner,—for the hard-working squaw is looked upon by an Indian of rightly constituted mind as a much more desirable acquisition than a mere gawky thing, gay in vermilion, brass wire, and hawk bells, or possessed of these meretricious graces so much prized by men civilized, and, if the truth must be told, by savage too. In Oregon I have seen the roots roasted until they became black; they are then pounded up and preserved in cakes. In Vancouver Island, and generally throughout the country, the roots are roasted (to convert the starch into sugar, though, of course, the Indian knows nothing of the *rationale* of the process) and preserved in bags for winter use. They are sweet to the taste, and appear to be a nourishing and far from unpalatable article of food. The roots of the *Sagittaria sagittifolia*, L., were at one time very extensively eaten by the Indians under the name of *wappattoo*, and, on the Columbia river, there is an island called Wappatoo Island, from the abundance of this plant. Since the introduction of the potato, the use of the roots of *Sagittaria* has much declined, and the name is now transferred to the potato. In the vicinity of nearly every village are small patches of potatoes; but the ground is merely scratched up, and the cultivation far from being properly attended to. Their innate laziness and hatred of any work out of the ordinary routine of their life—not consecrated by tradition and laws made and provided for—will not allow of their either properly attending to these patches or increasing their cultivation and their own material comforts thereby, to the boundless extent which they might, the land costing nothing; however, since the introduction of this useful tuber, the Indians

* A good account of this plant will be found in the catalogue of Geyer's plants, in Hooker's 'London Journal of Botany,' vol. v.

are much less subject to starvation and the uncertain privations of a savage life, and some of them excel in the cultivation of the plant, their potatoes bringing from the whites a higher price than any other. On Queen Charlotte's Islands is held a sort of regular "potato fair" every year, when tribes from all parts come to buy in exchange for the products of their countries and industries. Some of them have strange notions of the best method of cultivation. I once lived in an Indian village for some days, where, regularly every morning, as the squaws were lighting the lodge fires, and preparing the morning meal, the old chief would solemnly stalk through the village shouting in a stentorian voice, "Eat the little potatoes, keep the big ones for seed! Eat the little potatoes, keep the big ones for seed!" The bulbs or roots of *Lilium Canadense*, L., *Brodiea grandiflora*, Sm., and *Endosmia Gardneri*, Hook. (S'hah-gok of the Nisqually Indians), are all eaten in the parts of the country where they are found. The roots of *Eulophus ambiguus*, Nutt., are pulverized and baked into bread. Everywhere among the aborigines in Vancouver Island and the neighbouring country, the roots of the ordinary *Pteris aquilina*, L. (Slee-uk of the Tsongeisth), is boiled and eaten as food; they look upon them as a great luxury. This food is no doubt nourishing, as the roots contain a considerable amount of starch. The writer of these memoranda well remembers when starving in a great north-western forest, and expecting every sun to be his last, how anxiously he and his companions sought, but sought in vain, for the bracken roots! The root of *Peucedanum fœniculaceum*, Nutt., is also eaten, and by some the roots of *Aquilegia Canadensis*, L.,* *Erythronium grandiflorum*, Pursh,† *Fritillaria lanceolata*, Pursh, *Allium* (*Canadense*, L., and *A. reticulata*, Nutt.) mixed with other food, etc. Douglas says that the root of *Lupinus littoralis*, Dougl., are eaten by the Indians near the mouth of the Columbia river (Chenooks). I have never known them do so, but I have seen the natives at the same place eat the roots of *Abronia arenaria*, Mennz., which he might have mistaken for the former plant.‡ Some of the miserable tribes in California, eat the roots of the *tule*§ (*Scirpus lacustris*, L.), which chokes up the lakes and swampy lands of some portions of Southern Oregon and California. Among the plants eaten by the Kootanie, Colville, and other tribes in that part of British Columbia and Washington territory, is the beautiful *Lewisia rediviva*, Pursh. The roots are gathered in great quantities, and boiled and eaten like *salep* or arrowroot. In this state they are not unpleasant to the taste, slightly bitter, but are highly valued by the Indians as a nutritive food for carrying on long journeys, two or three ounces a day being sufficient for a man even under great fatigue (Hooker, Fl. Bor. Amer. i. p. 223). These Indians call it Ptleem-asd-ilse-ne-mare, and look upon it as one of the great gifts from the Supreme Master of Life. The roots of *Phaca aboriginorum* (Rich.), Hook.,—a plant of the eastern side of the Rocky Mountains, which, however, probably extends to the west of the range,—are gathered by the Cree and Stone Indians, in the spring, as an article of food. The root and young stems of *Heracleum lanatum*, Michx., are eaten by some of the coast tribes, and it is also used by the Crees of the eastern slope of the Rocky Mountains as a pot-herb. The seeds of many plants are used as cereals. Thus the seeds of various species of *Pinus* (*P. flexilis*, Torr., *P. Sabineana*, Dougl., and *P. Lambertiana*, Dougl.), are all eaten in the parts of the country where they prevail, and is accordingly the "nut-pine" of that part of the country, though the name is often thought to

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* Var. *formosa*, Fischer.

† This splendid *Erythronium* is figured and described by Dr. Hooker in the June number of the 'Magazine of Botany and Kew Miscellany,' from specimens introduced by me into England. It is there called *E. giganteum*, Dougl.

‡ *Vide* also Cooper, Nat. Hist. W. T. Bot. p. 55.

§ *Tule, tula, tulare*, as variously pronounced; derived from the Mexican—*tulitl*.

apply to *P. Sabineana* alone,—a fertile source of error. The Indian climbs the tree and throws down the cones to the squaw beneath, who carefully secures them, otherwise the squirrels would make short work with them. The cones are then scorched to open them and destroy the troublesome resin, so that the winter supply of pine-seeds, which it has been thought would supply such a harvest to the botanist, is perfectly useless, the vitality being extinct in them. When I visited Oregon in 1865, I found that in *P. Sabineana*, as in nearly every other conifer, the "pine-seed harvest" had failed, and the Indians suffered much. One of these pines (*P. Lambertiana*, the "sugar-pine"), yields a sugar, which is occasionally eaten, though it has cathartic properties. It is only found on scorched trees, and in very small quantities. I have, however, heard of a man who devoted himself, for a few weeks, to the business of collecting it, and obtained 150 pounds. It can scarcely be distinguished from the manna of the shops, except by a slight terebinthine flavour. In times of scarcity the Indians will eat the liber of *Pinus contorta,* Dougl. Along both sides of the trail, in the passes of the Galton and Rocky Mountains, many of the young trees of this species are stripped of their bark, from a foot or so above the ground to a height of six or seven feet. This is done by the Indians during their annual buffalo-hunting expeditions from the Kootanie and Kalispelm country to the plains east of the Rocky Mountains, for the sake of the inner bark which they use as food, as well in its fresh state as when compressed into thick cakes, so as to render it portable (Lyall, Linn. Journ. Bot. vii. p. 141). I am not aware that the Coast Indians make any use of it for food. The seeds of *Vicia gigantea*, Hook., are also eaten. Many species of grass-seeds (*e. g. Elymus arenarius*, L.) are collected for food. They are ground in a mortar, or roasted and made into soup. The seed of the wild rye (*Hordeum jubatum*, L.) is especially held in request among the Shoshones of Southern and Eastern Oregon, and a staple article of diet among the Klamaths; near the Klamath Lake, in the same section of country, are the seeds of the yellow water-lily (*Nuphar advena*, Ait.), the gathering and preparation of which I described in one of my published letters.* "Chestnuts" (*Æsculus Californica*, Nutt.) are usually made into a gruel or soup. After being ground in a mortar, they are mixed with water in a waterproof basket, in which red-hot stones are thrown, and then the soup is cooked. As the stones, when taking out from the fire, have dirt and ashes adhering to them, the soup is not clean, and it often sets the teeth on edge. The acorns of several species of oak (*Quercus*) are eaten with perhaps as much avidity as they were by the ancient Britons,—only we are too familiar with the process as practised by the "Digger" to throw any shade of romance around it. The acorns of the Californian oaks are mostly large, and the trees in general produce abundantly, though some years there is a great scarcity, and much misery ensues among the poor natives. They do not, however, contain, in proportion to the bulk, an equal amount of nutriment with cereals. The acorns are gathered by the squaws, and are preserved in various methods; the most common plan is to make a basket with twigs and rushes in an oak-tree and keep the acorns there. The acorns are prepared for eating by grinding them and boiling them with water into a thick paste, or by baking them into bread. The oven is a hole in the ground, about eighteen inches cubic. Red-hot stones are placed in the bottom, a little dry sand or loam is placed over them, and next comes a layer of dry leaves. The dough or paste is poured into the hole until it is two or three inches deep; then comes another layer of leaves, more sand, red-hot stones, and finally dirt. At the end of five or six hours the oven has cooled down, and the bread is taken out, in the form of an irregular mass, nearly black in colour, not at all handsome to the eye or agreeable to the

* 'Farmer,' Nov., 1865 (Horticultural Department), etc.

palate, and mixed with leaves and dirt. For grinding the acorns a stone pestle and mortar is used.* The nuts of hazel (*Corylus Americana*, Walt.) are also extensively gathered as food in some parts of the country where they are found. The fruit of the crab-apple (*Pyrulus rivularis*, Dougl.) are prepared for food by being wrapped in leaves and preserved in bags all winter; when they get sweet, they are cooked by digging a hole in the ground, covering it over thickly with green leaves, and a layer of earth or sand, and then kindling a fire above them. The fruit of the *Cerasus mollis*, Dougl., is also eaten. All of the edible berries of the country are eagerly collected by the Indians, and either eaten fresh or preserved for winter use; indeed, the "berry sun" is a great season with them, and all throughout the lovely summer weather of North-west America, you ever now and again come upon parties of women and children, in the woods, engaged in this agreeable pursuit. Equally so is it with the frontier white women and children, who get up parties of this nature for days and even weeks together, into the mountains. I used to come across these marooning parties in my wanderings, and some of the pleasant remembrances I have of my wild north-western life, is the kindness I received from these little-polished but good-hearted people,—acts which I can never return, save by this general acknowledgment in a circle of my fellow-botanists, and I assure you I gladly embrace the opportunity of so doing.† Some of the berries, such as the strawberries (*Fragaria vesca*, L., *F. Virginiana*, Ehr., and *F. Chilensis*, Ehr.), will not admit of being dried, and are accordingly eaten fresh or brought down to the frontier settlements and towns and there sold to the whites. Nearly all of the others are dried and pressed into cakes for winter use. During the latter end of the summer and autumn, all around Indian villages, but chiefly on platforms and on the flat roofs of the houses, vast quantities of these berries may be seen drying and being superintended by some ancient hag, whose hands and arms are dyed pink with them. When required for use, they are boiled, and form an agreeable dessert to salmon, beaver, or venison diet. The berries thus treated are various species of *Vaccinium*,‡ *Gualtheria shallon*,§ Pursh, *Amelanchier Canadensis*,‖ L., *Rubus Nutkanus*,** Moç., *R. spectabilis*, Dougl.,†† *R. leucodermis*, Dougl., *Ribes divaricatum*, Dougl., *R. niveum*, Lindl., etc.,—in fact, all the edible berries of the part of the country where the particular tribe lives. One of the Vacciniums (*ovalifolium*, Sm.) is well known to all north-western travellers (at least those who have been much among the northern Indians) as the *le brou* plant, being used to make a dainty of that name. The berries are gathered in the autumn, before they are quite ripe, and, after being pressed into a firm cake, it is dried and wrapped in bark and laid by. When it is to be used, a quantity is put into a vessel among cold water, and then stirred rapidly round with the hand, which must be free from grease, until it assumes a paste-like form. More water is then added and more stirring applied, until it assumes a form not unlike soapsuds. In this frothy state it is supped with long wooden spoons, made of *Pinus monticola*. It is pleasant to the taste, with a slightly bitter flavour, and is often prepared in Hudson's Bay forts as an Indian dish, which no traveller ought to leave the North-west without tasting. At their high feast the Indians will sup of this until they are ready to burst, and then waddle to the water, drinking of which seems to allay the distention caused by the other. The Indians (and grizzly bears) of Southern Oregon and California eat the berries of the *Manzanitta* (*Arctostaphylos glauca*, Dougl.), but I have never

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* Hittel's 'California,' p. 392; *vide* also Paul Kane's 'Artist's Journey' for some other methods of preparing acorns for food.

† A portion of this paper was read before the Botanical Society of Edinburgh, May, 1868.

‡ "Huckle-berries." § "Salal." ‖ "Service-berry."

** "Thimble-berry." †† "Salmon-berry."

seen the northern tribes make the same use of the berries of the allied species (*Arctostaphylos tomentosa*, Pursh). The tender shoots of various plants are eaten in the spring, such as the shoots of *Rubus Nutkanus* (canoe loads of which can be seen, in the season, on the way to Indian villages), *Rosa fraxinifolia*, Bork., the green stem of *Ligusticum Scoticum*, L., and *Peucedanum leucocarpum*, Nutt., which are peeled and eaten, as well as the stem of *Erodium cicutarium*, L'Hér. = the *alfilerilla* or "pin-grass" of the Californians, and some other plants of that sort. They seem to make use of no species of lichen for food, but make compressed cakes of a *Rhodymenia* for winter use. Capt. Mayne, R.N. ('British Columbia,' p. 256), however, says that they boil and compress into cakes "*L. jubatus*." I never saw them do so, though the statement is not at all improbable (see also Lauder Lindsay, Journ. Linn. Soc. Botany, vol. ix. p. 413–14). Grass and clover the Digger Indian (little elevated in his dietary above the lower animals) looks upon as great blessings, and eagerly eats them and grows fat on them too. The Californian white clover is, however, very sweet, and, I dare say, to these poor people forms, either raw or boiled, a very agreeable salad to their grasshoppers. Beyond the potatoe, they have no cultivated plant. Some of the Indians in Oregon used to grow a little wild tobacco, but they now buy the ordinary *Nicotiana* from the whites. I have seen some of them, when tobacco was scarce, in order, as they thought, to get the full benefit of it, inhale the smoke, gulping it down until it comes out at the nostrils and ears. They would repeat this once or twice, then hand the pipe to another, and lie down, almost senseless, to sleep off the stupor. In times of scarcity they will smoke the twigs of *Thuja gigantea*, Nutt., and the bark of *Cornus sericea*, L. (the *bois rouge* of the Canadian *voyageurs*), is usually mixed with tobacco even in times of plenty,—a habit the fur traders have learned from them. The leaves of *Arctostaphylos Uva-ursi*, L., are also extensively used among the Indians and frontier men all over the American continent, either alone or (more usually) mixed with tobacco under the Ojibway name of *Kinikennick*. Luckily for them, though passionately fond of intoxicating liquors, they have not acquired the art of preparing any. The stem of *Acer macrophyllum*, Pursh, contains much juice, but the north-west Indians have never attempted to make sugar from it as in the case of *A. saccharinum*, L., in the eastern provinces; indeed, neither have the whites. The Crees, however, make a sugar from *Negundo fraxinifolium*, Nutt., which probably extends over the Rocky Mountains.

(*To be continued.*)

JURIES.

The Commons' Select Committee on the summoning, attendance, and remuneration of special and common juries have concluded their labours. They recommend that the sheriff should have a larger discretionary power to increase the special jury lists, and that the system provided by the Common Law Procedure Act for the summoning of special jurors should be adopted in the metropolis as well as the country, not taking away from the parties the power of having "a special special-jury," as at present, if a judge should think fit. The Committee state their recommendations as follows:—"1. That the jury lists ought to be prepared with greater care, and to contain the names of many persons who are now either legally, or through negligence, omitted; and in order to ensure these objects the Committee recommend—That the overseers should be paid for their expenses in the preparation of the lists; that the lists should be revised by the guardians of the poor before being sent to the justices; that the overseers should be liable to a penalty for negligence in the preparation of the lists, as well as for wilful misconduct; *and that the present exemptions from serving on juries should be carefully considered;* that many of them ought to be abolished, and those retained should be

defined and enumerated in some Act to be passed relating to the subject. 2. That the mode of summoning special jurors for the trial of causes in London and Middlesex should be assimilated to that provided by the Common Law Procedure Act, 1852, for the trial of causes in other parts of England. 3. That a panel of not less than thirty special jurymen in each court should be returned each sitting for Middlesex and London for the trial of all special juries, and that special jurymen summoned for any one court be liable to serve, in case of necessity, in any of the other courts. 4. That the special jury list should be separately revised by the guardians of the poor, and that much more care should be bestowed than at present, in order to include therein persons qualified for special jurymen; and that persons duly qualified by education and property, as well as esquires, bankers, and merchants, ought to be placed on the special jury list. 5. That the practice of relieving persons liable to serve as grand jurymen from the duty of serving as common or special jurymen ought to be abolished; and that their services as grand jurymen ought only to count as service as jurymen. 6. That the names be taken by rotation from the jury list, and that no one be called upon to serve a second time until the whole list be fairly and fully exhausted. 7. That a notice of not less than four days be given to every juryman summoned to attend the sittings of the courts. 8. That no juryman be summoned, as now frequently happens, to serve in more than one court on the same day. 9. That the ordinary attendance of jurymen ought not to exceed one week at a time. 10. That the remuneration of special and common jurymen be made 'per diem,' and not by cause, and that such remuneration be at the rate of one guinea a day for special, and 10*s*. a day for common jurymen. 11. That better accommodation than at present exists in most courts of justice ought to be provided for jurymen." The Committee add that during their investigation other subjects connected with the jury laws have come under their cognizance; but, believing that they were not strictly within the terms of reference, the Committee forbear from making any special recommendation on these points; they believe, however, that such particulars are well worthy the future attention of Parliament, *e. g.*, the power of having a special jury in criminal cases, the reduction of the present number of the jury, and the expediency of making such alteration in the qualifications of jurymen as may best ensure the selection of educated and intelligent men to perform duties so onerous and so responsible.—*Times*, *July* 21, 1868.

OFFICIAL NOTICE.—MERCHANT SHIPPING ACT, 1867, 30 & 31 VICT., c. 124.

N.B.—This Notice appeared in the 'London Gazette' of the 7th July, 1868.

Scale of Medicines and Medical Stores for Merchant Ships.

Whereas, by "The Merchant Shipping Act, 1867," it is, amongst other things, provided that the Board of Trade shall from time to time issue and cause to be published scales of medicines and medical stores suitable for different ships and voyages;

And whereas by the same enactment it is further provided that the owners of every ship navigating between the United Kingdom and any place out of the same, shall provide and cause to be kept on board such ship a supply of medicines and medical stores in accordance with the scale appropriate to such ship:

And whereas the Board of Trade, in exercise of the powers vested in them by the above recited Act, did issue and cause to be published in the 'London Gazette' of the 13th December, 1867, a scale of medicines and medical stores applicable to different ships and voyages:

And whereas it has been made to appear to them that certain alterations are necessary therein:

Now, therefore, the Board of Trade, in pursuance of the powers vested in them by the said recited Act, hereby order and direct that the following scale of medicines and medical stores shall be substituted for the said scale published in the 'London Gazette' of the 13th December, 1867, aforesaid, and that this order shall be issued and published in the 'London Gazette.'

Dated at the Board of Trade this 7th day of July, 1868.

Thomas Gray,
One of the Assistant Secretaries to the said Board.

Scale of Medicines and Medical Stores issued and caused to be published by the Board of Trade in pursuance of the Merchant Shipping Act, 1867.

Preparations from British Pharmacopœia, 1867. This column is added for the use of Druggists supplying the Medicines indicated.	Names of Medicines, Medicaments, etc.	Proportion for Ships carrying the undermentioned number of Men and Boys (for 12 months).		
		10 and under.	11 to 20 inclusive.	21 and upwards.
	Alum	1 oz.	2 oz.	3 oz.
Copaiba	Balsam of Copaiba	4 „	8 „	12 „
	Bicarbonate of Soda	8 „	12 „	16 „
*Mist. Sennæ Co.	Black Draught	1 pint.	2 pints	3 pints.
Lotio Hydrarg. Nigra	Black Wash	1 „	2 „	2 „
	†Carbolic Acid, liquid or crystal. A mixture containing in each 100 parts not less than 80 parts of Carbolic or Phenic and Cresylic Acids, and their Homologues; and not more than 20 parts of Water.	½ gal.	1 gal.	2 gals.
Potassæ Tartras Acida	Castor Oil	1 lb.	2 lbs.	3 lbs.
	Cream of Tartar	2 oz.	4 oz.	8 oz.
	‡Condy's Crimson Fluid	½ pint.	1 pint	1 pint.
	Epsom Salts	3 lbs.	6 lbs.	12 lbs.
Ess. Menth. Pip	Essence of Peppermint	...	1 oz.	2 oz.
Tr. Zingib. Fortior.	Essence of Ginger	...	1 „	2 „
Liq. Plumbi Subacet. dil.	Goulard's Extract	1 oz.	2 „	4 „
	Iodide of Potassium	...	2 „	4 „
Tr. Opii	Laudanum	2 oz.	4 „	8 „
	Linseed Meal	...	14 lbs.	28 lbs.
Argenti Nitras	Lunar Caustic	¼ oz.	½ oz.	1 oz.
	Nitrate of Potash	2 „	4 „	8 „
Ung. Resinæ	Ointment, Basilicon	3 „	6 „	10 „
„ Hydrargyri	Ointment, Mercurial	1 „	2 „	4 „
„ Simplex	Ointment, Simple	6 „	12 „	16 „
	Olive Oil	...	8 „	12 „
Lin. Opii	Opodeldoc	3 oz.	6 „	10 „
Tr. Camph. Co.	Paregoric	4 „	6 „	8 „
Pil. Hydrarg., 5 grs.	Pills, Blue	1 doz.	2 doz.	3 doz.
„ Ipecac. c. Scillâ, 5 grs.	Do. Cough	2 „	4 „	6 „
„ Sapon. Co., 5 grs.	Do. Opium	1 „	2 „	3 „
„ Coloc. c. Hyosc., 5 grs.	Do. Purging	3 „	6 „	8 „
„ Rhei Co., 5 grs.	Do. do. Mild	3 „	6 „	8 „
Pulv. Rhei Co.	Powder, Comp. Rhubarb	2 oz.	4 oz.	8 oz.
„ Catechu Co.				
„ Cret. Arom. c. Opio, equal parts	§Powder, Diarrhœa	1 „	2 „	3 „
„ Ipecac. Co.	Do. Dover's	1 „	2 „	3 „
	Do. Ipecacuanha	1 „	2 „	3 „
	§Quinine	1 „	2 „	3 „

* Omit extract of liquorice, and substitute aromatic spirit of ammonia, 1 oz. to 1 pint of the mixture.

† As an antiseptic and deodorizing agent for common use.

‡ For purifying drinking-water when necessary.

§ Double the quantity above indicated to be taken to all tropical ports.

Preparations from British Pharmacopœia, 1687. This column is added for the use of Druggists supplying the Medicines indicated.	Names of Medicines, Medicaments, etc.	Proportions for Ships carrying the undermentioned number of Men and Boys (for 12 months).		
		10 and under.	11 to 20 inclusive.	21 and upwards.
Sp. Ætheris Nitrosi .	Spirit of Nitric Æther . . .	...	2 oz.	3 oz.
	Sulphate of Zinc	1 oz.	2 „	3 „
	Sulphur (Sublimed)	4 „	6 „	8 „
Tr. Hyoscyami . .	Tincture of Henbane	1 „	2 „	3 „
„ Rhei	Tincture of Rhubarb	4 „	10 „	12 „
Lin. Terebinthinæ .	Turpentine Liniment	2 „	4 „	6 „
	The Solution of Chloride of Zinc	4 pints	8 pints	16 pints
PARTICULARS.	SCALES OF MEDICAL STORES AND NECESSARIES.			
	Adhesive Plaster on unbleached calico, in tin case	1 yard	2 yards	3 yards
	Lint	½ lb.	¾ lb.	1 lb.
Marked in English figures	Scales and Weights	1 set	1 set	1 set
Marked in drops . .	Graduated drop measure . . .	...	1	1
„ spoonful .	Graduated 2 oz. measure . . .	1	1	1
	6 oz. bottles	½ doz.	½ doz.	1 doz.
	Corks for bottles	1 „	1½ „	2 „
	Scissors	...	1 pair	1 pair
	Syringes	2	2	4
	Lancet	1	1	1
	Abscess do.	1	1	1
Leg and arm size . .	Bandages	...	6	6
	Calico	3 yrds.	4 yards	6 yards
	Flannel	2 „	3 „	6 „
	Needles, pins, thread, and tape .	...	1 paper	1 paper
	Splints, common	1 set	1 set	1 set
36 in. single reversible	Trusses	1	1	1
Printed directions for use	Enema syringe	1	1	1
	Pewter cup	...	1	1
	Teaspoon (pewter)	...	1	1
	Bougies	1 set	1 set	1 set
No. 8	Catheter	1	1	1
	Bed-pan	...	1	1
	Arrowroot	2 lbs.	4 lbs.	8 lbs.
	Pearl barley	4 „	8 „	16 „
	Rice	4 „	8 „	16 „
	Corn Flour	4 „	8 „	16 „
	Sago	4 „	8 „	16 „
	Sugar	14 „	28 „	56 „
Preserved . . .	Soup and Bouilli	6 „	12 „	24 „
	Boiled Mutton	6 „	12 „	24 „
	Essence of Beef	6 tins (¼ pint)	12 tins	24 tins
	Compressed Vegetables (mixed)	4 lbs.	8 lbs.	16 lbs.
	Potato (if not in scale of provisions)	14 „	28 „	56 „
	Wine (Port)	3 botls.	6 botls.	12 botls.
	Brandy	2 „	4 „	6 „

ACCIDENTAL POISONING BY STRYCHNIA.

On Saturday, July 18th, Dr. Lankester, the coroner for Central Middlesex, held an inquest at Kensington Palace-gardens, Notting Hill, on the body of Miss Campbell, aged thirty-two, who died through taking a large dose of strychnia, having mistaken one bottle for another. It appeared that the deceased had been directed by her medical adviser to take, at mealtimes, five drops of liquid containing strychnia, and was supplied with a bottle in which was an ounce of liquid, containing four grains of that poison. On Thursday evening last, having dressed for dinner, she put the five drops into a bottle of water similar in appearance to her medicine bottle, and left them both on the toilette-table until ready to leave the room. She then put one of the bottles in her dress-pocket and proceeded to the dining-room, and while seated by a lady she poured the fatal dose into a glass and drank it. The moment she did so she frantically exclaimed, "I have taken poison; I am poisoned. I have taken the wrong bottle!" She madly rushed into the drawing-room, where she afterwards received prompt medical attendance, but she died in half an hour. Dr. John Evans deposed to being called to the deceased on Thursday evening at seven o'clock, and saw her on the bed. She was pulseless. Her neck was bent back, her fingers were contracted, and she had all the symptoms of poisoning by strychnia. She lived about ten minutes. The *post-mortem* examination showed that the muscles were rigid, and the fingers and toes contracted. Internally the lungs were gorged. There was a little blood in the right side of the heart, the left being empty, and the stomach was congested. The cause of death was poisoning by strychnia, the deceased having taking three grains. The coroner condemned the practice of vending poisonous medicine in ordinary bottles. He said they should be dark-coloured and rough, to distinguish them from others. Had it been so in this case, the unfortunate lady would not have lost her life. He, however, wished it to be known that if common mustard or table salt had been immediately administered as antidotes, there might have been a beneficial result. The jury returned a verdict of "Accidental death by poisoning."

The following remarks on this case appeared in the 'Express' of Monday, July 20th:—On Saturday an inquest was held, at Notting Hill, on the body of a lady, who died through swallowing a strong, in mistake for a weak, solution of strychnine. Her medical adviser having directed that five drops of the more potent liquid should be diluted with water and taken at mealtimes, the lady proceeded to mix a draught, placing the dose in a bottle which, apparently, had previously held similar medicine, for it was identical in form with that containing the poisonous quantity of strychnine. Subsequently mistaking the bottles, she drank the wrong fluid and died in half an hour. In commenting on this case, the coroner, overlooking, as we think, the real cause of this lamentable accident, condemned the practice of placing poisonous medicines in bottles of ordinary form, and suggested the use of danger bottles, dark in colour, and of rough exterior. Now, supposing two such bottles to be at the disposal of a patient, one having been empted by the due abstraction of daily doses, it is difficult to see how any peculiarity of colour, form, or surface would prevent the empty one being used as the vessel in which to carry away in the pocket a diluted portion of the stronger medicine. The cause of the accident in the present, and in many similar instances, would seem to be due to the growing practice of prescribing highly concentrated and poisonous medicines, the task of dilution being left to patients, nurses, and servants, who have other things to think about, instead of the dilution being allowed to remain, as formerly, part of the duty of the druggist.

In the 'Times' of July 21st, Mr. G. S. Pedler writes:—

"Sir,—Miss Campbell's sad end, as reported in your columns of to-day, ought to suggest some plan of preventing a possible chance of its repetition.

"Great danger now exists from the fashion of ordering concentrated forms of medicine to be taken in drops or teaspoonfuls, as drops vary much in size, and the modern teaspoon holds twice the quantity held by the old teaspoon when it was adopted as a measure for medicine, and when *liquor morphiæ*, *liquor strychniæ*, etc., were unknown even to the profession.

"This danger is apparent, as shown in Miss Campbell's case, from the fact of her single ounce bottle containing ninety-six doses, or enough to endanger the lives of

many persons. The public would be far safer if physicians would order their medicine in draughts, or single dose bottles, as they used to do in all important cases thirty years since, or in the graduated four or six dose bottles, now in general use.

"Yours most obediently,

"*Fleet Street, July 20th.* "GEORGE S. PEDLER."

SIR THOMAS WATSON, M.D., ON THE TREATMENT OF CHOLERA AND DIARRHŒA.

"I find it necessary to modify considerably some advice which I formerly gave my auditors as to the treatment of a disorder which appears to be again increasingly prevalent throughout the country." The form and features of this dreaded pestilence have, he says, "been the same in all its visitation to this country. Must we still, as heretofore, make the mortifying confession that our art is unable to cope with it successfully? Not so, I trust. Among the many and discordant expedients which have been brought forward and fairly tried for the cure of cholera, one, long since suggested, and almost scornfully rejected, has emerged of late into clearer significance and more intelligible and ascertained value. I mean the method—recognized as legitimate and reasonable in various other maladies—of 'elimination,' of which the main advocate has been Dr. George Johnson, Professor of Physic in King's College." After commenting upon the facts and principles involved, Sir Thomas Watson lays down the following rules, in language partly his own and partly that of Dr. George Johnson:—"Diarrhœa ought not to be neglected even for an hour. One important and guiding rule of treatment is not to attempt by opiates, or by other directly repressive means, to arrest a diarrhœa while there is reason to believe that the bowel contains a considerable amount of morbid and offensive materials. The purging is the natural way of getting rid of the irritant cause. We may favour the recovery by directing the patient to drink copiously any simple diluent liquid—water (cold or tepid), toast-water, barley-water, or weak tea; and we may often accelerate the recovery by sweeping out the alimentary canal by some safe purgative, and then, if necessary, soothing it by an opiate. Castor-oil, notwithstanding its unpleasant taste, is, on the whole, the safest and best purgative for this purpose. It has the advantage of being very mild and unirritating, yet withal very quick in its action. A tablespoonful of the oil may be taken floating on cold water, or any other simple liquid which may be preferred by the patient. A mixture of orange-juice or lemon-juice with water forms an agreeable vehicle for the oil. If the dose be vomited it should be repeated immediately, and the patient should lie still, and take no more liquid for half an hour, by which time the oil will have passed from the stomach into the bowels. Within an hour or two the oil will usually have acted freely. Then a tablespoonful of brandy may be taken in some thin arrowroot or gruel; and if there be much feeling of irritation, with a sense of sinking, from five to ten drops of laudanum may be given in cold water. These means will suffice for the speedy arrest of most cases of choleraic diarrhœa. If the patient have an insuperable objection to castor-oil, or if the oil cannot be retained on the stomach, 10 or 15 grains of powdered rhubarb, or a tablespoonful of the tincture of rhubarb, or a teaspoonful of Gregory's powder, may be substituted for the oil. If the diarrhœa has continued for some hours, the stools having been copious and liquid; if there be no griping pain in the bowels, no feeling or appearance of distention of the intestines, the abdomen being flaccid and empty, and the tongue clean, we may conclude that the morbid agent has already purged itself away. There will, therefore, be no need for the castor-oil or other laxative, and we may immediately give the brandy in arrowroot and the laudanum as before directed. The rule in all cases is not to give the opiate until the morbid poison and its products have for the most part escaped,—not to close the door until 'the enemy' has been expelled. While there are some cases in which the evacuant dose is not required even at the commencement of the attack, there are many more in which the opiate is unnecessary in the later stage. In some cases of severe and prolonged diarrhœa it may be necessary to repeat the oil and laudanum alternately more than once at intervals of three or four hours. Practical skill and tact are required to discriminate these cases. It must be borne in mind that when the choleraic secretions are being actively poured out from

the blood-vessels, the bowel, though it may have been completely emptied by a dose of oil, may quickly again become filled with morbid secretions, and hence the need for an occasional repetition of the evacuant dose. If the diarrhœa be associated with vomiting, this should be encouraged and assisted by copious draughts of tepid water. The vomiting affords relief, partly by the stimulus which it gives to the circulation, but mainly by the speedy ejection of morbid secretions. If there be nausea without vomiting, and, more especially, if the stomach be supposed to contain undigested or unwholesome food or morbid secretions, an emetic may be given—either a teaspoonful of powdered mustard, or a tablespoonful of common salt, or 20 grains of ipecacuanha powder, in warm water. In all cases of severe diarrhœa the patient should remain in bed."—*British Medical Journal.*

ON LIQUID FUEL.

BY BENJAMIN H. PAUL, ESQ.

(*Substance of a Lecture delivered before the Society of Arts.*)

The economy of fuel is a subject of so much importance in a variety of aspects, and it affords so much scope for improvement, that any suggestion made with that object is always deserving of full consideration; and, even if such suggestions should be impracticable or erroneous, it is at least worth while to demonstrate clearly the circumstances which may be considered as justifying an adverse opinion. That such a course is appropriate in regard to a project which is expected to involve a reconstruction of our navy and a radical revolution in steam navigation, will, I apprehend, be readily admitted.

The proposal to substitute for the coal now used as fuel in steam-vessels some kind of liquid combustible, is an off-shoot of the excitement which has prevailed during the last few years in regard to the discovery of vast quantities of petroleum in America; and it was that material which was in the first instance recommended as the substitute for coal. A commission appointed in America some years ago to investigate the subject reported that petroleum was beyond doubt more than twice as effective as anthracite coal in the production of steam, and that steam could, by the use of this material, be produced in less than half the usual time.

It was an inference by no means unnatural that if this were the case, and if coal could be superseded by this material as the fuel of steam-vessels, a very great portion of the space required in merchant steamers for the stowage of coal would be rendered available for more profitable cargo; that steam-packets might become independent of coal depôts at various points of their passage; and that vessels of war would be enabled to keep the sea for a very much longer time than they now do with coal. Any prospect of such advantages as these being attainable might reasonably have been expected to justify a more thorough and searching investigation of this subject than it has yet received in this country.

Besides petroleum, several other analogous materials have been proposed as substitutes for coal; for instance, the oil obtained by distilling particular kinds of coal, or the shale which occurs in coal formations, and more recently the oil known as "dead oil," which is one of the products obtained in rectifying the coal-tar of gas-works. All these materials resemble each other closely in being composed chiefly of carbon and hydrogen, which are, in various proportions, the combustible and heat-producing constituents of all kinds of fuel. For the application of these materials and of liquid fuel generally, various methods have been proposed; but before speaking of them it is desirable to consider what is the evaporative power of these materials respectively, since that is a very important point to determine in regard to the question as to the relative merits of these different kinds of fuel.

The heat generated by combustion has been made the subject of the most careful investigation; and since the time of Lavoisier, Laplace, and Rumford, the more precise measurement of the amounts of heat capable of being produced by the combustion of carbon and hydrogen, has been repeated by several physicists with results which agree so closely, that they may be safely regarded as well established. The names of Dulong, Despretz, Andrews, Favre, and Silbermann are, moreover, an unquestionable guarantee that these results, and the methods by which they were obtained, are perfectly trustworthy. According to these results, the maximum heat-producing capabilities of carbon and hydrogen are in the ratio of 1 to 4·5. The actual quantities of heat generated by the combustion of a pound of carbon or of hydrogen are as follows:—

Relative Calorific Power.

		Pound.	Heat units.
Carbon	1	14,500	1·00
Hydrogen	1	62,032	4·28

The heat unit here referred to is the quantity of heat which raises the temperature of one pound of water one degree F. (from 40° to 41°). Therefore, the numbers given in the table represent the quantities of water capable of being heated one degree F. by the conversion of one pound of carbon into carbonic acid gas, or of one pound of hydrogen into water. As there are, in the Fahrenheit thermometric scale, 180 degrees between the freezing-point and boiling-point of water, those numbers divided by 180 give the corresponding quantity of water capable of being heated from 32° to 212° F. Again, the quantity of heat required to convert a pound of water at 212° F. into steam of the same temperature, is nearly 5½ (more exactly 5·37) times as much as that requisite to heat a pound of water from the freezing-point to the boiling-point; therefore, the quantities of steam capable of being produced from water at 212° F. by the total heat generated in the combustion of a pound of carbon or of hydrogen, are of course ascertainable by dividing the number of pounds heated from 32° to 212° F. by 5·37. The several quantities are given in the following table:—

Quantities of Water.

Heated.		Or converted into steam.	By the heat generated in combustion of.
From 40° to 41° F.	From 32° to 212° F.	From water at 212° F.	
lbs.	lbs.	lbs.	lbs.
14,500	80·55	15·	1 carbon.
62,032	344·62	64·2	1 hydrogen.

These quantities of 15 pounds and 64·2 pounds of water convertible into steam by the total heat generated in the combustion of a pound of carbon or of hydrogen, represent what is termed the "theoretical evaporative powers" of those substances. By the term theoretical, however, it is not to be understood that these values are in any degree imaginary or assumed; they represent actual facts, which have been established as the results of positive observation, and they are theoretical in reference to the practical application of fuel only in this sense, that these results are not realized in ordinary practice. The reason of this is not the existence of any uncertainty that the total quantities of heat generated by burning a pound of carbon or a pound of hydrogen are respectively capable of converting 15 pounds and 64·2 pounds of water at 212° F. into steam, but it is simply the fact that, under ordinary circumstances, only a portion of the total heat generated in either case is ever *available* for the production of steam. The statement of the theoretical evaporative power of fuel, or of carbon and hydrogen as constituents of fuel, is therefore, like the statement of relative calorific power, only an expression of the relative capabilities, and it indicates in this respect a limit which, though it cannot be exceeded in any case, is never fully attained in practice.

In order to ascertain what portion of the heat resulting from the combustion of carbon and hydrogen is available for producing steam, it is necessary to consider what are the conditions under which fuel is usually burnt, and what becomes of the heat generated in the two cases. In making this inquiry it is also necessary to remember that the several substances concerned in the combustion of fuel require different quantities of heat to produce equal increments of temperature in equal weights, as stated in the following table:—

Quantities of Heat.

		Heat units.	
One pound of	Carbonic acid gas requires	·217	To raise its temperature from T to T × 1° F.
	Nitrogen ,,	·245	
	Atmospheric air ,,	·238	
	Steam ,,	·475	
	Water ,,	1·000	
	Water at 212° F. ,,	966·100	for conversion into steam.

It will be seen that water has by far the greatest capacity for heat, both in the state of liquid and vapour, and that a very large quantity of heat is rendered latent in the conversion of water into steam.

In the combustion of carbon each pound requires for its conversion into carbonic acid gas, 2·67 pounds of oxygen, which is derived from atmospheric air; and as this contains only 23 per cent. by weight of oxygen, it is necessary to supply about 12 pounds (more accurately 11·61 pounds) of air for every pound of carbon burnt.

In the combustion of hydrogen, 8 pounds of oxygen are requisite for each pound of hydrogen, and to furnish this about 35 pounds (more accurately 34·78 pounds) of air must be supplied.

But fuel is never burnt for raising steam in such a way that the supply of air is only just sufficient to furnish oxygen for the conversion of its carbon into carbonic acid gas, and of its hydrogen into water vapour. In order to maintain combustion, it is necessary to remove the gaseous products from the furnace, as well as to supply fresh air continually; and when this is effected, as usual, by the draught of a chimney, the gaseous combustion products become mixed with the fresh air to some extent. The effect of this intermixture would be to retard the combustion of the fuel, if the amount of burnt air or combustion products in the atmosphere of the furnace exceeded a certain proportion. Consequently, it is necessary to prevent this by supplying more air than would suffice to furnish oxygen for combustion, so as to dilute the combustion products and maintain an excess of oxygen in the atmosphere immediately surrounding the fuel in the furnace. Careful observation has shown that in ordinary boiler furnaces the quantity of air requisite for this purpose amounts to as much as that requisite for effecting the chemical change which takes place in combustion, so that the total supply of air to such a furnace is usually at the rate of about 24 pounds per pound of carbon burnt, and about 70 pounds per pound of hydrogen burnt.

Under ordinary circumstances, the relation between the quantities of these substances burnt as fuel, the total heat generated, the air supply requisite for supporting combustion, and the furnace gas resulting from it will be as follows:—

Fuel.	Quantity burnt.	Air supply.	Total heat generated.	Furnace gas,
	Pound.	Pounds.	Heat units.	Pounds.
Carbon	1	23·22	14,500	24·22
Hydrogen	1	69·56	62,032	70·56

The heat generated in either case is, at the moment of combustion, transferred to the gaseous combustion product, and raises its temperature. In the combustion of carbon, the whole of the heat is effective in this way; but in the combustion of hydrogen, a portion of the heat generated is consumed in determining the vaporous condition of the water produced, in the proportion of 9 pounds for each pound of hydrogen burnt. As 1 pound of water at 212° F. requires 966·1 heat units to convert it into steam of the same temperature, the quantity of heat which becomes latent in this way amounts to 8694·9 heat units ($9 \times 966{\cdot}1$) per pound of hydrogen burnt, or 14 per cent. of the total heat of combustion. That portion of the heat is ineffective, either for increasing the temperature of the combustion product or for producing steam in the boiler; and it must therefore be deducted from the total heat generated, in order to ascertain the amount of heat available, which is as follows, compared with that generated by the combustion of carbon:—

	Quantity burnt.	Total heat generated.	Latent heat of water vapour produced.	Available heat.	Equivalent evaporation of water at 212° F.
	Pound.	Heat units.	Heat units.	Heat units.	Pounds.
Carbon	1	14,500	...	14,500	15
Hydrogen	1	62,032	8695	53,337	55

In the combustion of carbon, under the conditions above mentioned, the products constituting the furnace gas amount to nearly 25 pounds per pound of carbon burnt, and they require the following quantities of heat to raise their temperature one degree of Fahrenheit's scale :—

	Pounds.	Specific Heat. Heat units.		Heat units.
Carbonic acid gas	3·67	× ·217	=	·79639
Nitrogen	8·94	× ·245	=	2·19030
Surplus air	11·61	× ·238	=	2·76318
	24·22			5·74987

The increase of temperature resulting from the combustion of carbon is therefore found by dividing the number of heat units, representing the total quantity of heat generated, by the number of heat units requisite to raise the temperature of these combustion products, etc., one degree, and it amounts to

$$2522^\circ \text{ F.} = \frac{14{,}500}{5{\cdot}75}$$

In the combustion of hydrogen under the same conditions, the products constituting the furnace gas amount to about 70 pounds per pound of hydrogen burnt, and they require the following quantities of heat to raise their temperature one degree of Fahrenheit's scale :—

	Pounds.	Specific Heat. Heat units.		Heat units.
Water vapour	9	× ·475	=	4·27500
Nitrogen gas	26·78	× ·245	=	6·56110
Surplus air	34·78	× ·238	=	8·27764
	70·76			19·11374

Consequently, the increase of temperature resulting from the combustion of hydrogen is :—

$$2791^\circ \text{ F.} = \frac{62.032 - 8695}{19{\cdot}114}$$

So far, therefore, as relates to increase of temperature, the effect produced by the combustion of hydrogen under these conditions is not much greater than that produced by the combustion of an equal weight of carbon, notwithstanding the great difference in the actual quantities of heat generated, as shown below :—

		Total heat generated.	Available heat.	Increase of temperature.
	Pound.	Heat units.	Heat units.	
Carbon	1	14,500	14,500	2522° F.
Hydrogen	1	62,032	53,337	2791° F.

We have now to consider what portion of the *available* heat is, under ordinary conditions, *effective* in producing steam. The heated furnace gas, resulting from the combustion of the carbon or the hydrogen of fuel, is the medium by which the heat generated is transferred to the water in the boiler ; and if it could be managed that, between the moment of combustion and the time when the furnace gas resulting from it is discharged into the chimney, the whole of the available heat could be communicated to the water in the boiler, the evaporative effect realized might then be equal, or nearly equal, to the theoretical evaporative power of the fuel burnt. But this is never the case in ordinary practice.

The extent to which the available heat could, in any case, become effective in producing steam by direct transmission to the boiler must, of course, be limited by the temperature corresponding to the pressure at which steam is to be raised. If that were 50 pounds per square inch, the furnace gas could not be cooled down below 360° F. before being discharged from the heating surface of the boiler into the chimney. The quantities of heat which would in such a case pass away in the furnace gas, without being directly effective in producing steam in the boiler, would amount to 12 per cent. in the combustion of carbon, and 10·8 per cent. in the combustion of hydrogen, as follows:—

	Quantity burnt.	Furnace gas.	Quantity of heat requisite to produce increase of temperature = 300°.	Equivalent evaporation of water at 212° F.
	Pound.	Pounds.	Heat units.	Pounds.
Carbon .	1	25	300° × 5·750 = 1725	1·8
Hydrogen .	1	70	300° × 19·114 = 5734	5·9

These quantities of heat would therefore be wasted as regards production of steam, except in so far as they might be applied in heating the feed-water supplied to the boiler.

But when, as in ordinary practice, the supply of air for supporting combustion is maintained by the draught of a chimney, the temperature of the furnace gas cannot in any way be reduced below about 660° F. without interfering with the draught of the chimney, and thus a waste of heat is occasioned considerably larger than that just mentioned as being the minimum waste.

In very many instances the furnace gas is discharged into the chimney at a temperature very much more than 600° F. above the temperature of the external air, and then the waste of heat is of course even still greater in proportion as the temperature of the gas is higher.

In the case of furnace gas, discharged at 600° F. above the temperature of the air supplied to the furnace, this waste amounts to 24 per cent. of the available heat resulting from the combustion of carbon, and to 22 per cent. of that resulting from the combustion of hydrogen; these amounts being equivalent to the evaporation of 3·6 pounds of water at 212° F. per pound of carbon burnt, and to 11·9 pounds of water at 212° F. per pound of hydrogen burnt.

The amount of heat capable of becoming effective in producing steam cannot therefore be greater than the difference between the total available heat and the heat thus wasted in the furnace gas. This amount is about 76 per cent. of the available heat generated by combustion of carbon, and about 78 per cent. of that generated by combustion of hydrogen. This comparison does not take into account those sources of waste which are due to imperfect combustion, but applies only to such portions of the carbon and hydrogen of fuel as are actually burnt in the furnace. In this case the comparative efficiency of these constituents of fuel in producing steam is as follows:—

Combustion of Carbon.

Quantity burnt, 1 lb.		Equivalent evaporation of water.	
		at 212°	at 60°
	Heat units.	lbs.	lbs.
Total heat of combustion	14,500	15·	...
Available heat	14,500	...	...
Waste heat of furnace gas	3,480	3·6	...
Effective heat	11,020	11·4	9·8

Combustion of Hydrogen.

Quantity burnt, 1 lb.		Equivalent evaporation of water.	
		at 212°	at 60°
	Heat units.	lbs.	lbs.
Total heat of combustion	62,032	64·2	—
Latent heat of water vapour	8,695	—	—
Available heat	53,337	—	—
Waste heat of furnace gas	11,520	11·9	—
Effective heat	41,817	43·3	38

Thus the maximum evaporative efficacy of carbon and of hydrogen is, for each pound burnt, respectively equal to the conversion of about 11½ pounds and 43½ pounds of water at 212° F., into steam of the same temperature, and under the ordinary atmospheric pressure. The extent to which this *efficacy* is *realized* in the ordinary application of fuel for producing steam will depend upon the relative facilities afforded by the rate of combustion and by the construction of the boiler, for the full absorption of the effective heat from the combustion products during their passage along the flues or tubes of the boiler before being discharged into the chimney. But whatever may be the influence of these conditions in regard to evaporative effect produced, they do not in any degree affect the foregoing considerations as to the maximum evaporative capabilities of the carbon and hydrogen of fuel when burnt in the manner stated, with a supply of air just twice as great as the quantity requisite for their conversion into carbonic acid gas and water vapour.

From these considerations it will be evident that in the combustion of fuel, under ordinary conditions, there is always a great waste of heat actually generated and available. The total waste is considerably greater in the combustion of hydrogen than it is in the combustion of carbon, amounting in the one case to 32·6 per cent., and in the other to 24 per cent. of the total heat of combustion, but still the evaporative efficacy of hydrogen is nearly four times as great as that of carbon.

In the combustion of hydrocarbons under these conditions, whether they be solid, liquid, or gaseous, the total amount of heat generated will be determined by the relative proportions of the carbon and hydrogen they contain. The amount of hydrogen in such substances generally ranges from one-seventh to one-fourth by weight, and for such limits the corresponding amounts of heat generated by their combustion, and their theoretical evaporative power would be as follows:—

Hydrocarbon burnt.	Carbon.	Hydrogen.	Total heat of combustion.	Equivalent evaporation of water.	
				at 212°	at 60°
lb.	lbs.	lbs.	Heat units.	lbs.	lbs.
1	·86		× 14,500 = 12,470		
		·14	× 62,032 = 8,684		
			21,154	21·9	18·8
1	·75		× 14,500 = 10,775		
		·25	× 62,032 = 15,508		
			26,283	27·1	23·3

It must be remembered that these results are above the truth, for this calculation does not take into account the quantity of heat expended in effecting the decomposition of the hydrocarbon, *i.e.* the separation of the carbon from the hydrogen, nor does

it make allowance for the circumstance that the quantities of heat calculated as being generated by the hydrogen, are calculated according to the heat-producing power of *gaseous* hydrogen. The results given above, as expressing the theoretical evaporative powers of these hydrocarbons, are therefore too high by an amount corresponding to the heat requisite to decompose the hydrocarbons and to convert the hydrogen from the *liquid* state it has in the hydrocarbons, to the gaseous state it has in the vapour resulting from their combustion.

The difference between the theoretical evaporative power of hydrocarbons comprised within these limits of composition, and their evaporative efficacy will be determined by the relative proportions of carbon and hydrogen they contain, just in the same manner as shown already, so far as relates merely to the mode in which the heat generated is disposed of amongst the combustion products constituting the furnace gas resulting from their combustion. And it is here necessary to notice another circumstance of considerable importance as regards the advantageous application of fuel, and especially hydrocarbon fuel.

(*To be continued.*)

ALOES.

If we were to inquire what drug is most frequently taken by the population of the British Isles, we believe the answer would be—aloes. Moreover, it is one of the oldest of drugs. The preparations in use at the present day and their names carry us back from the British Pharmacopœia through the Middle Ages to the days of the Roman Empire. It is unique in its action. When properly used, it promotes an important function without disturbing others, and it is now what it was in the days of Celsus, the medicine *par excellence* for townsfolk and literary people—*urbani* and *literarum cupidi*—for those, in fact, who oftenest send for a doctor, pay him best, and criticize him most sharply, who keep pill-boxes on their dressing-tables, who are miserable without their daily relief, and more miserable if it be accompanied with nausea, griping, or exhaustion. It may be worth while, then, to devote a few spare moments to the study of a drug so important.

More than 2000 years ago aloes was as well known at Rome as it is now, and was spoken of in popular proverbs as the very symbol of bitterness. Yet the aloes, which was imported then, as now, from India and Arabia, though better than what was manufactured on the shores of the Mediterranean, must have been of a very sorry description. Not only was it largely adulterated with stones and sand, but it is clear, from the descriptions of Dioscorides and Galen, and the enormous doses in which it was given, that it possessed such a comparatively large proportion of the so-called resinous ingredient—that which is insoluble in water and is rejected in making the watery extract—that it had almost as great a reputation as an astringent and desiccative as an aperient.* It formed a part not only of aperient boluses and *hierœ picræ*, but was an ingredient in those resinous applications to wounds and ulcers of which the old books contain legions, and of which the Friar's Balsam, or tinct. benzoes co., containing aloes, is a venerable survivor, and the carbolic acid treatment a reproduction. In fact, Galen clearly recognized two elements in it—one moderately astringent, one vehemently bitter. To the former were ascribed its virtues as a tonic and vulnerary, to the latter as a purgative. They had a plan in those days of *washing* drugs. They found by experience that the oxide of copper and other coarse metallic preparations in vogue were deprived of much of their irritant property by dissolving out their soluble parts; and in applying this to aloes, they discovered that, if well washed, it lost its purgative virtue nearly or altogether,—a rough bit of analysis, but one which medical practitioners, down even to our own day, have hardly seen the force of, or they would not have talked as they did of the activity of the so-called resinous part of aloes. We find Dr. Garrod and Dr. Farre, according to the admirable lectures on the Pharmacopœia by the former, published in this journal in 1864, making experiments, even then, to convince their weaker brethren of the worthlessness of the insoluble part of aloes.

We may now skip about 1200 years, during which medical science was chiefly kept

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* *Vide* Galen, De Simplic. Rem., lib. vi.

up by the Jewish and Arabian students and imitators of the Greek medical classics. The Arabians, in turn, were drawn upon by the medical writers of western Europe, when printing had been invented, and physical science awoke from the dust. The great authority John Mesue, of Damascus, whose works were the source of all pharmaceutical lore in the sixteenth century, and who was, so to say, the lineal ancestor of all Pharmacopœias down to the British, gives aloes, if possible, a higher character than his Greek predecessors. The maxim found in Dioscorides, and in some editions of Celsus, was enforced—that aloes was so congenial to the stomach, that it ought to be mixed with all purgatives. And we soon find the acutest physicians of the day writing monographs on aloes, in which they recognize it not as a mere purge, but as a preserver of health by keeping the intestines in their normal activity. Curious is it, as a sign of the leisurely, dreamy, bookworm state of mind in the early part of the seventeenth century, to find monographs, respectable treatises in their size, written to describe and recommend some one preparation of aloes. Such a work is the 'Aloedarium' of the great Raymund Minderer, of Augsburg, once the most accomplished scholar and physician to the most serene Duke of Bavaria, and to the noble family of the Fuggers—a man whose prescriptions were copied by the physicians of the whole world. Now, his name is forgotten by those who prescribe his febrifuge, the liquor ammoniæ acetatis; it is heard only in the mouths of the vulgar, who ask at a chemist's for "spirit of Mindererus" for a cold in the head; but whether Mindererus was a man, or a beast, or a stone, they wot not. *Sic transit gloria medici.*

This 'Aloedarium' of Minderer, dated at Augsburg in 1622, contains in 270 duodecimo pages, a most elaborate account of his pet compound of aloes with spices and aromatic gums, and of all that ever was said by authors, sacred and profane, about each of the ingredients separately. The components were three ounces of aloes, three scruples each of marum and of saffron, three half-drachms of agaric, costus, and myrrh, three drachms of ammoniacum, three times two drachms of rhubarb, and three half-scruples of lign. aloes. Each of these fancifully proportioned ingredients was separately macerated in a separate and supposed appropriate liquid—for instance, the aloes in rose water, the myrrh in rue vinegar—so that no less than twenty liquids were employed in concocting the nine solids into what, no doubt, was a very useful predecessor of our compound rhubarb pill. What is noteworthy and practical about Minderer is, that he recommends his compounds in what, for the age, were small doses—that is, from ten grains down to two or three; that he advises it to be taken often for the preservation of health, and not (by itself) as a purge in sickness, and that he specifies the class of people who should take it: not the lean, dark, and nervous, but the big, flaxen Saxon populations who ate plenty of fat meat, and washed it down with daily draughts of fat ale.

A few years later we meet with another monograph, the 'Aloe Morbifuga,' published at Antwerp in 1633, by Dr. William Marcquis, sworn physician of that city. It is a curious thing that all the literary and medical part of this work is a direct copy—theft, we suppose we may say—from Minderer; not merely the ideas, but the words are borrowed. Yet, in one respect, it shows great progress. For, lo! the author apologetically prescribes the drug in its native simplicity, without the usual bombastic parade of heterogeneous admixture. Nay, more; Marcquis is, we believe, the father of the watery extract of aloes. Surely they err, he says, who wash their aloes with repeated onpourings of rain-water, till they get a clean, dry, tasteless residue; for they wash away the valuable part, and leave the dregs. But although he gives a formula for the watery extract, he does not like to throw away all the insoluble portion, whose astringency he thinks of some value.

Already, in the time of Minderer and Marcquis, we find the West Indies enumerated amongst the places from which aloes was brought to Europe, and from that time to the present the account of its varieties and properties has been handed down from one writer on drugs to another with little intrinsic variation. We are usually taught to recognize four varieties as regards physical condition. First, the semi-transparent, brittle, of reddish-yellow colour, conchoidal resinous fracture, and of an aromatic smell, which (to us) is like that of wormwood. Secondly, the opaque, of a dull, liver-yellow, gummy, and tougher in fracture, imported in calabashes, and with a smell the only analogue of which is just the "three ounces of a red-haired wench," which the witches in 'Macbeth' add as the climax to their cauldron "to raise the stench." Thirdly, a

blackish resinous aloes of nauseous smell; and, lastly, a refuse variety, mixed with all sorts of impurities, which is traditionally described as *caballine*, or horse-aloes. This last is, we suspect, very little an article of commerce just now, and no one who knows the value of animal life in this country at present need think that it is used by horse-doctors. Mesue, by the bye, tells us that the rougish dealers in his day used to try to improve the look of their worst aloes by washing it in urine and saffron, so as to give it a yellower colour.

Such being the physical characters, we are taught to believe that the first variety comes from Socotra (the *Insula Dioscoridis* of the later Greeks), the second from Barbadoes, the third from the Cape. We find, moreover, that the British Pharmacopœia gives its sanction to the Socotrine and Barbadoes only. But here we may look with curiosity at the returns of the Board of Trade for 1866, from which we take the following quantities as imported in that year:—

Imported from	lbs.	Declared value per cwt. £. s. d.
Holland	15,514	7 10 0
British India, Bombay, and Scinde	23,226	7 9 6
Barbadoes	75,873	8 10 0
Other parts	1,669	7 9 4
British Possessions in South Africa	791,594	1 15 1
East Coast of Africa	2,631	1 13 1

These figures are curious, to say the least. The total quantity imported is 910,507 lbs. Of this 114,282 lbs., or somewhat about one-eighth, are of the orthodox sorts (for the Bombay includes the Socotrine), and are worth, as imported, about 1*s.* 6*d.* per lb.; whilst the Cape (which seems as cursed in its drugs as in its wine) contributes seven-eighths of the whole at the prime value of $3\frac{1}{4}d.$ per lb.! As none but the 114,282 lbs. of the best enters into legitimate pharmacy, what becomes of the 794,225 lbs. of the worst? Making every allowance for exportation to America and France, where the Cape aloes is *officinal*, what a vision these figures give us of cheap griping physic—what material for quack pills.

When we ask to what the difference of one kind from another is due—whether to climate, to species of *aloe*, or to mode of preparation—we get very uncertain answers; and in what that difference consists we are equally at a loss. The pharmaceutists of the last century affirmed that the Socotrine contained most soluble matter, and considered it the best and the only kind fit for the Pharmacopœia; they also thought the Barbadoes griped, because of its excess of so-called resin. At the present day the Barbadoes is most in favour, as being most active; and its excellence, which is rated by Mr. Squire as half as strong again as Socotrine*, is thought to be due to its less proportion of resin. On this point, we are assured by a friend who has taken aloes for forty years, that the difference lies in the quality, and not in accidental impurity or dose of the drugs; and that the Barbadoes produces quite a different sort of sensation from the Socotrine. One thing is clear, that the best aloes is not considered too good for a valuable horse, and the Barbadoes goes to the stable whilst the Cape goes to the cottage.

The insoluble part of aloes is of no definite taste, but melts in the mouth and sticks to the teeth. It probably consists mainly of the mere common juices of the plant; but it may sometimes, according to Mr. Squire, contain some portion of the true bitter extract which has been spoiled and rendered insoluble by oxidation during careless manufacture; and this, which is possibly mischievous, is got rid of in the watery extract, as well as what is inert.

In order not to be tedious, let us now endeavour to wind up what we have to say in the following axioms, whose brevity must be their apology for their apparent dogmatism:—

Aloes should always be given in the solid form. It takes twice or thrice the quantity in solution to produce the same effect. All the tinctures, wines, and elixirs are as wasteful as nasty. Even the favourite decoction is a mistake. It were far better to

* See 'Companion to the British Pharmacopœia,' 5th ed., p. 20.

give one grain of watery extract in a pill, and a dose of potash and cardamoms in a draught, than to waste four grains of the extract in an ounce of decoction.

The best aloes should always be given, no matter its price. It would not fetch the money if not worth it.

The watery extract should also be always given; the crude is barbarous. How is the dose to be fixed of a drug of which twenty to sixty per cent. may be inert?

All the preparations containing alkali, like the enema aloes of the P. B., "in order to render the resinous parts soluble," etc. etc., are nonsensical barbarisms. The active principle of aloes is as soluble as sugar, and what is dissolved by alkali is useless, if not mischievous.

The time which aloes takes to operate, viz. from six to ten hours, the greater activity of solid than of liquid preparations, and the kind of effect produced, are positive and ultimate facts. There is said to be a notion that it acts on the muscular fibre, and not on the mucous membrane of the intestines; that it has "an effect on the venous system;" and that the reason it acts on the large intestines is because it does not dissolve until it reaches the colon. We may well gasp when such delirious stuff is handed about as medical knowledge! Aloes is as soluble as sugar; no respectable pharmaceutist would sell a pill knowingly that would not dissolve in the stomach, and if it did pass the thirty feet of stomach and small intestines undissolved, who could ensure its solution in the six feet of the drier and more sluggish colon?

Its action on the colon is through the blood, and not local. An enema of pure aloes neither irritates the rectum, nor a wound.

Aloes, so salutary to the torpid bowels of full-fed, phlegmatic people as an *eccoprotic*, *i. e.* "scavenger," may gripe the colon and irritate the rectum severely if given to persons whose bowels are not loaded, and tongues clean and reddish. Or it may do the same to any one, if given too often or in too large a dose, or for the purpose of acting like a saline purge. Great spasm of the rectum, piles, and a copious discharge of thin mucus may be produced by too large doses or too often.

Aloes may be taken for forty years discreetly, and produce no piles. Again, piles may come to persons who ought to take aloes but do not, and may follow any violent purge which forces the mucous membrane through the sphincter. They often follow spontaneous diarrhœa and dysentery, as they do aloes if misused, no more and no less.

The dose of aloes should be as small as possible, and reduced by degrees. Half a grain to a grain of watery extract is enough for ordinary constipation.

It may be given to the youngest children—for instance, to babies of a year old, whose bowels are obstinately constipated, and motions pale and curdy. For children too young to swallow a pill, no vehicle is equal to the powder or (better) the powdered extract of true liquorice, which again may be enveloped in a bit of butter, and put on the back of the tongue. A bit of extract of liquorice dissolved in the mouth first, and coating the tongue, prevents some nauseous medicines from being immediately tasted.

Experience seems to show that aloes acts more satisfactorily when dissolved and combined with certain substances not purgative. But the aloes must not be spoiled by too long a process. Minderer and Marcquis used to subject aloes to *insuccation*, *i. e.* dilution with bland juices; they dissolved it in water—(Marcquis threw away the dregs, like a man of sense)—then mixed the solution with wine, the juice of rose-leaves, etc. In fact, the pompous 'Aloedarium' of Minderer was one preparation of the kind, and the *pilulæ aloes dilutæ* of the late Dr. Marshall Hall another. The prescription of Dr. M. Hall, in so far as it used crude aloes, was worse than its Jewish predecessor, the *pilulæ alefanginæ*, 500 years earlier, and that of the present P. B. worse than that of the P. L.

Many aloetic compounds have existed with acid, including deservedly-forgotten elixirs. One of some value remains in the pills of Barbadoes aloes four grains mixed with two minims of concentrated sulphuric acid, which is said to overcome very obstinate bowels. The acid seems to lose its causticity. This is quoted from the 'Surgeon's Vade Mecum,' ninth edition, appendix, where it is said to be derived from Dr. Robert Dickson, the eminent botanist and pharmacologist.

Of the ancient combinations of aloes with aromatics, the *hiera picra*, or "sacred bitter," of the Græco-Romans, a compound of aloes with cinnamon, is still given, mixed with gin, by old women to young girls troubled with "obstructions." The pills of aloes with myrrh, which bear the name of Rufus, who lived in the second century, and with

assafœtida, are survivors of a very large family. Aloes compounded with tonics, as iron, strychnia, zinc, quinine, often enables those tonics to be taken with benefit.

One thing more has survived, and is in the most active use at present, viz. the combination of aloes with real drastic purgatives; as the pilulæ gambogiæ comp., and pil. coloc. comp. Both are simplified forms of ancient prescriptions; and the compound colocynth dates from at least the time of Galen, the aloes being added to mitigate and correct the action of the stronger ingredients. This compound may be traced in various forms down from the Greeks through the Arabians to ourselves; but the singular thing is that it is known to our vulgar by the name which it had centuries ago, though the physician may have forgotten it. Many a practitioner who has loitered in a chemist's shop has heard customers ask for a penn'orth of *Pill cochy*, or, as many call it, *Pil a coshy*. This is in some establishments the same amongst pills that a Saturday pie is amongst dishes—that is, a compound of all the odds and ends of purgatives worked up with common aloes, so that a good lump can be sold for a penny. But its real composition is seen in formularies of the last century, where it appears as "Pilulæ ex colocynthide cum aloe, vulgo *coccia* minores." One of the most effective purgatives in the world is this same pill, as now made at Apothecaries' Hall, and used by old-fashioned practitioners and families. But why is it called "Cocciæ?" The answer involves the history of pills.

When mankind became civilized enough to take physic, they soon must have learned the comfort of swallowing nauseous drugs in the solid form. The solid bits so swallowed were prescribed by the Greek and Roman physicians after the magnitude of various berries and seeds; thus, Celsus directs the size of an almond of one composition, the size of an Egyptian bean of another, and so on. The morsels themselves were called *catapotia*, which we should now call *boluses*, although the exact English equivalent is *gulp*, or *gobbet*. But the word *coccus* was also used for a small berry, and *coccion* for the diminutive thereof; and the word *coccia*, or seeds, for what we call pills, seems to have been brought into popular use in the seventh century. The original *coccia* were lentil seeds—"granula ervi." Paul of Ægina's recipe, in the sixth century, was,—Of aloes, colocynth pulp, and extract of wormwood, each one part; scammony, two parts: mix. His dose was *eleven* coccia, each the size of a lentil. We pity the bowels that should be subjected to so many *coccia* of the compound colocynth pill of the British Pharmacopœia.

Two kinds of pills became famous, as the greater and lesser coccia. Hence, the word *coccia* was adopted in later Latin, not as the name of pills in general, but of these pills in particular; moreover, it was corrupted into a feminine noun of the first declension; and hence it is that English poor people now go to chemists' shops to ask for *pil. cochiæ.*—*Medical Times and Gazette.*

CHEMICAL PROMOTIONS.

There is some stir in the chemical world *à propos* of existing vacancies and probable promotions. Unfortunately the number of remunerative offices which can be held by scientific chemists in this country is small, and the emoluments, for the most part, are absurdly insufficient. That accomplished chemical pluralist, Dr. Frankland, having resigned one of the least lucrative of his positions, Dr. Odling will succeed him—whether wholly or in part seems not quite clear. Dr. Odling will, we believe, associate with himself a co-lecturer at St. Bartholomew's Hospital; and this will probably create a vacancy in the chemical chair of another Metropolitan medical school. Dr. Lyon Playfair will also, it is understood, vacate the chemical chair in the University of Edinburgh, in the case of his election to represent the University in Parliament. It is expected that he will be succeeded by Dr. Anderson, Professor of Chemistry in the University of Glasgow.—*British Medical Journal, July* 4, 1868.

Obituary.

J. S. HEATON.

On July 4th, at Manchester, after a few days' illness, Mr. J. S. Heaton, Pharmaceutical Chemist, aged 51. He was connected with the Society from its commencement, and was deeply respected by all who knew him.

BOOKS RECEIVED.

WHO DISCOVERED ANÆSTHESIA? By S. PARSONS SHAW. Manchester: Palmer and Howe; London: Trübner and Co. 1868. (Pamphlet.)

ON ANILINE AND ITS DERIVATIVES. A Treatise upon the Manufacture of Aniline and Aniline Colours. By M. REIMANN, Ph.D., L.A.M., etc. The whole revised and edited by WILLIAM CROOKES, F.R.S., etc. London: Longman, Green, and Co. 1868.

THE HALF YEARLY ABSTRACT OF THE MEDICAL SCIENCES. Vol. XLVII. January–June, 1868. London: John Churchill and Sons. Edinburgh: Maclachlan and Co. Dublin: Fannin and Co.

THE MEDICAL PROFESSION, AND ITS EDUCATIONAL AND LICENSING BODIES. By E. D. MAPOTHER, M.D., etc. (First Carmichael Prize.) Dublin: Fannin and Co. London: Longman and Co. Edinburgh: Maclachlan and Co. 1868.

MEDICAL EDUCATION AND MEDICAL INTERESTS. By ISAAC ASHE, A.B., M.B., etc. Dublin: Fannin and Co. London: Longman and Co. Edinburgh: Maclachlan and Co. (Carmichael Essay.) 1868. (From the Publishers.)

WATER ANALYSIS: A Practical Treatise on the Examination of Potable Water. By J. ALFRED WANKLYN, M.R.C.S., etc., and ERNEST THEOPHRON CHAPMAN. London: Trübner and Co., Paternoster Row. 1868.

TO CORRESPONDENTS.

Persons having seceded from the Society may be restored to their former status on payment of arrears of subscription and the registration fee of the current year.

Those who were Associates before the 1st of July, 1842, are privileged (as Founders of the Society) to become Members without examination.

The Decimal System.—The following, from Mr. Ernest Agnew (Paris), is in reply to Mr. Howden's question in our last issue:—"That a question may be answered by a question, we have on divine authority. Have you in Great Britain any coins or whole numbers to express the value of an article bought at the rate of five for a duodecimal shilling? But such arguments are puerile. The duodecimal system is a convenient one in certain respects. Twelve is a number divisible by four factors, hence its utility. But our incongruous system of weights, measures, and coinage is only partially duodecimal. That the decimal is and always will remain the simpler as long as ever the present numeral notation will exist, is due to the fact that the very system of notation by means of cyphers or written figures is decimal or digital in origin, in expression, in entirety. To argue further would be useless. Practical experience of both systems is, after all, the best method of judging. Did you live in a country where the decimal system existed, I am sure that you, with an Englishman's idea of order and method, could not fail to appreciate the complete harmony and symmetrical simplicity of the system. Your questions can be answered with greater ease, applying to a decimal coinage, than to a hybrid one such as ours, and moreover convey a more distinct impression of the *exact* cost of each article. That 3·3 represents $\frac{1}{3}$ of 10 is more evident and palpable to the internal sense of calculation than that 4*d.* is $\frac{1}{3}$ of a shilling. Moreover, you err in your last statement; $\frac{1}{4}$ of a franc is a whole number of centimes (25), $\frac{1}{8}$ of 10 francs is 1·25 francs, etc. I am not ambitious of confuting the "experience of ages," but the decimal system entails the purchase of bottles, fruits, and hosts of other articles by the 100 and 10 instead of by the dozen and gross."

Preservation of Liquorice Root.—In reply to a query in a former number, Mr. E. Tebbutt (Kilburn) recommends the following plan, which, he says, is perfectly successful:—The vessel used is a common earthen bread-pan, large enough to hold about 7 lbs. of root. Four inches from the rim is placed a false bottom, thickly perforated with large holes upon which the root is placed, filling up the space between the two bottoms with water. The consequence of the arrangement is a constantly damp atmosphere within the jar; a small hole is made in the lid to prevent mouldiness.

"*Matico*" wishes to know the means of bleaching the tops of meerschaum pipes, without injury to the material.

T. J. M. (Ireland).—(1.) *Syr. Ferri Phosph. Quinæ et Strychniæ.* A syrup now in use

under the above name is made as follows. As this preparation is very liable to change, it should not be kept for any length of time:—

5 drs. Ferri Sulph.
6 drs. Sodæ Phosph.
192 grs. Quinæ Sulph.
q s. Acid. Sulph. Dil.
q. s. Aquæ Ammoniæ.
6 grs. Strychniæ.
14 oz. Acid. Phosph. Dil.
14 oz. Sacchar. Alb.

Dissolve the Sulphate of Iron in 1 oz. of boiling water, and the Phosphate of Soda in 2 oz. of boiling water. Mix the solutions, and wash the precipitated Phosphate of Iron till the washings are tasteless. With sufficient diluted Sulphuric Acid dissolve the Sulphate of Quinine in 2 oz. of water; precipitate the Quinine with Ammonia water, and carefully wash it. Dissolve the Phosphate of Iron and the Quinine thus obtained, as also the Strychnia, in the diluted Phosphoric Acid, then add the Sugar, and dissolve the whole without heat. The above syrup contains about 1 grain of Phosphate of Iron, 1 grain of Phosphate of Quinine, and $\frac{1}{32}$ of a grain of Strychnia in each drachm.

(2.) *Chlorodyne.* In Mr. Squire's 'Companion to the Pharmacopœia,' page 80, under "Liquor Chloroformi Compositus," will be found a formula which has been represented as the composition of this popular medicine. It is as follows:—"Chloroform, 4 oz.; Ether, 1 oz.; Rectified Spirit, 4 oz.; Treacle, 4 oz.; Extract of Liquorice, $2\frac{1}{2}$ oz.; Muriate of Morphia, 8 grs.; Oil of Peppermint, 16 minims; Syrup, $17\frac{1}{2}$ oz.; Prussic Acid (2 per cent.), 2 oz. Dissolve the Muriate of Morphia and the Oil of Peppermint in the Rectified Spirit; mix the Chloroform and Ether with this solution; dissolve the Extract of Liquorice in the Syrup, and add the Treacle; shake these two solutions together, and add the Prussic Acid"

G. B. H. (Chertsey) sends the following copy of a prescription:—

℞ Argent. Oxid. gr. iss.
Ext. Nuc. Vomic. gr. $\frac{1}{6}$.
Morph. Mur. gr. $\frac{1}{32}$.
M. ft. pil. Mitte xx.

He states that, having prepared the pills with confection of roses, the pills in a short time exploded with evolution of considerable heat. Extract of gentian was afterwards used instead of the confection, but with a similar, although more feeble, result. He wishes to know the cause.

Oxide of silver holds its oxygen by a very weak affinity, and readily gives it up to substances such as morphia or essential oils, which absorb it with avidity, the action assuming the character of combustion. Permanganate of potash will sometimes act in the same way as oxide of silver.

"*Chemicus*" (Dover).—We cannot advise in such a matter. The probable advantages of emigration would depend on circumstances of which we have no information.

"*Chemicus*" (Bath).—We recommend our correspondent to study, and pass the Minor Examination. The requisite information may be obtained from the Secretary, 17, Bloomsbury Square.

T. A. (Wednesbury).—The information will be found in a little work just published, 'Water Analysis,' by Wanklyn and Chapman.

"*Anxious.*"—See the Amended Act, page 76.

"*St. Kilda*" (Gravesend).—Yes.

A. P. S. (Liverpool).—The pills cannot be made according to the formula given. Suet, not bread, is necessary. See Vol. VII. (N. S.), page 615.

"*Disp.*"—As it is not probable that the resinous precipitate is intended to be applied to the skin, we should advise its separation from the lotion.

Instructions from Members and Associates respecting the transmission of the Journal before the 25th of the month, to ELIAS BREMRIDGE, Secretary, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Messrs. CHURCHILL, New Burlington Street. Other communications to the Editors, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. X.—No. III.—SEPTEMBER, 1868.

THE NEW PHARMACY ACT.

So many inquiries as to the construction to be put on various sections of the new Pharmacy Act, and the steps necessary to be taken to obtain registration under it, have reached us, that, although we elsewhere refer our correspondents to the Registrar for information in *individual* cases, we think it well to state here, as clearly as we can, in language more familiar than parliamentary phraseology, the *general* requirements of, and the privileges secured by, this great addition to the Act of 1852; believing, as we do, that if carried out honestly, but yet liberally, a vast amount of good will be accomplished for pharmacy. We feel, too, that it is the Pharmaceutical Society which initiated, and to whom the execution of the Act has been entrusted; and we hold it as a great and important trust,—a trust involving the interest of the Society itself, of a still greater range of chemists and druggists not hitherto connected with the Society, and of every member of the community who, or whose friends, may at any time have occasion to resort to the aid of medicine. It is true that the Act opens with the avowed purpose of regulating the sale of poisons, but it is equally true that it ends by declaring its title to be "*The Pharmacy Act*, 1868;" and no man can read it through without at once discovering the correctness of this latter description. Every qualification for vendors of poisons is a qualification to practise pharmacy, and necessarily so when with the selling of these dangerous articles is coupled also the dispensing and compounding of them. This is a provision which must hereafter enforce the education of every dispensing chemist. It is evident that a person who is not permitted to compound a mixture containing opium, chloroform, emetic tartar, or any other poison enumerated in the schedule, will be practically unable to undertake dispensing at all. The Pharmaceutical Society, as we have said, initiated the Act, and is charged to carry it into operation. It is, therefore, the duty of the Society to give early information to those who will hereafter be affected by it, both as to regulations they will have to observe and privileges placed within their reach, more especially as some of the latter, if not applied for before the end of the present year, can only be had afterwards at greater cost, and some would be lost altogether.

To commence, then, with the duties enforced. Passing over the preamble, which is a mere enunciation of principles, we find that, after the 31st day of December next, no person can sell, or keep open shop for compounding poisons, or call himself a chemist and druggist, or chemist or druggist, or pharmacist, or dispensing chemist, or druggist, in Great Britain, unless he is registered under this Act; and he cannot be so registered if he be not a pharmaceutical chemist, or a chemist and druggist who kept an open shop

for compounding prescriptions before the passing of this Act (31st of July, 1868); or a person who was registered before that time as an assistant or associate under the Act of 1852; or an assistant to a pharmaceutical chemist or chemist and druggist who had attained the age of twenty-one years and been for three years (also before that date) employed in dispensing and compounding prescriptions, and who shall, *before the 31st day of December in the present year*, send in a certificate to the Registrar of having been so engaged, and shall afterwards pass a *modified examination*; or a person who shall hereafter pass the Minor examination of the Pharmaceutical Society.

All these persons, being registered as chemists and druggists, may sell and keep open shop for dispensing and compounding poisons, but they must also "*conform to such regulations as to the keeping, dispensing, and selling of poisons as may from time to time be prescribed by the Pharmaceutical Society with the consent of the Privy Council.*"

Certain provisions to be observed in the sale of poisons are fixed in the Act, and it is of the utmost importance that all who sell them should study the 17th section carefully.

It in effect says this—

That no poison whatever, in a pure and simple form, shall be sold retail unless distinctly labelled with the name of the article, the word "Poison," and the name and address of the seller.

That no poison shall be sold by wholesale to retail dealers unless the name of the article and the word "Poison" be distinctly marked thereon. The same precaution to be applied to articles to be exported from Great Britain.

That no poison which is named in Part I. of the schedule shall be sold by retailers to strangers unless introduced by persons known to the seller; that whenever any such is sold, the particulars of the sale shall be entered in a certain book kept specially for such entries, and the entry shall be signed by the purchaser and by the person who introduced him, if he was unknown to the seller. These stringent regulations, applicable to Part I. only, are not required to be observed by wholesale dealers in the ordinary course of wholesale dealing or in exports.

That masters shall be answerable for the acts of their apprentices and servants in this matter.

That none of the provisions of this section, either those first named for all poison, or the latter for poisons in Part I., shall in any way interfere with an apothecary in supplying medicines to his patients.

Nor with a chemist registered under this Act in compounding medicines, provided he keep a copy of the prescription, or a record of the ingredients, with the name of the person for whom it is prepared, in a book as ordered, and put his own name and address on the label containing the directions for use, or title of the compound as the case may be.

Arsenic is only to be sold, as heretofore, under the provisions of the Arsenic Act.

We hope our readers will clearly understand the distinction between poisons in the first and second parts of the schedule. That there may be no mistake, we would add, without wishing to lessen in the smallest degree that caution which we think every chemist would feel it his duty to use, in the sale of such articles, as well for the public as his own safety, that the only *legal* requirement in selling oxalic acid, chloroform, belladonna and its preparations, essential oil of almonds, opium and all preparations of opium and poppies, is that they should be distinctly labelled as aforesaid, but that in selling any of the poisons set down in Part I., those additional precautions necessary for the identification of the purchaser must be observed. There are many dangerous articles passing through the hands of chemists daily, but

in the eye of *this* law none is poison unless named in the Act, or hereafter added by the authorities described in section 2.

We have exhausted the duties. They are not onerous, perhaps scarcely more than careful men who have always scrupled to put dangerous articles into the hands of careless or ignorant customers will be glad to perform, because there will be a reasonable ground now for asking questions of purchasers which might have been deemed impertinent or inquisitorial before. As to the copying of prescriptions, that is but an ordinary practice in most houses of business.

Let us now say a word on the privileges. The sole right to sell and compound poisons, and use certain titles can need no comment; it is so important that few will deny it is worth the duties imposed, and the means of securing this right are easy for all men who were in business on their own account before the 31st of July, 1868. They have only to give the Registrar proof according to schedules C. and D. of their right, and he must register them at once. If they apply before the last day of 1868 they will be registered without fee of any kind, if they delay their application beyond that time they must pay the ordinary fee payable by those who pass the Minor examination, whatever that fee may from time to time be fixed at. They will too be eligible for election as members of the Pharmaceutical Society, and to sit at its Council Board. If any man should say, "Of what advantage can that membership be?" we would reply, "You see what position the Society has achieved by its union and faithful adherence to the principle of its founders; that pharmacy has been advanced to an honourable profession, the members of which can meet in conference and discuss creditably questions both of class and public interest; that it has now been able to secure the full confidence and trust of the Government and Parliament; and that a certain portion of the honour and credit of a body corporate must always attach to the individual members of that body." We might point to its Journal, its Library, its Museum, its organization to resist encroachments from whatever quarter they may be threatened,—and its "Benevolent Fund," but that we know nobody ever expects to want it.

But the power to secure the right of registration on easy terms is not confined to men in business on their own account only. Assistants who were twenty-one years of age at the time of the passing of the Act, and had been employed in dispensing and compounding prescriptions during the preceding three years, may, on passing a modified examination (the *proposed* synopsis of which will be found elsewhere in our present number), be registered also as Chemists and Druggists. They must, however, make application, and send their certificates to the Registrar during the present year, although they need not be examined so soon.

As this is a point on which information is asked by many, we may state for their guidance that assistants of *chemists* only can claim this privilege. Surgeons who kept open shops for general dispensing and the sale of drugs to the public as well as their own patients, were *de facto* chemists and druggists, and their assistants may be reckoned accordingly. Not so dispensers in private surgeries, hospitals, or public dispensaries; and it should be remarked, that heavy penalties are imposed on persons who obtain registration by fraudulent means, as well as on the Registrar who shall admit improper persons.

Several letters of complaint regarding the amendment made by the House of Commons in this particular section have reached us,—not so much on account of the imposition of a modified examination on assistants, as on the condition of the three years' practice being limited to the three years immediately preceding the passing of the Act. We must confess some sympathy

on this point. Many circumstances may have prevented assistants being actually engaged *always* between July 31st, 1865, and July 31st, 1868. We apprehend, however, that the Registrar will be allowed to construe this provision according to its spirit rather than its letter, as we presume the object of those who introduced the condition was simply that persons claiming under it should be those still connected with pharmacy, although an interval of a few months might have elapsed in their engagements.

Hitherto men in business on their own account could not legally remain *Associates* of the Pharmaceutical Society. Hereafter they may do so; and if they choose to pay the same subscription as members (one guinea annually), they may have the privilege of attending meetings of the Society and voting thereat. The assistants to be registered after the modified examination just mentioned will be eligible for election as Associates.

Another important change in the rules of the Pharmaceutical Society is introduced by the provision of the 21st clause, which enables all voters, whether residing in the country or London, to vote by forwarding their voting-papers to the Secretary, instead of attending personally on the day of election. It has hitherto been compulsory on all voters residing within five miles of the General Post-Office to appear at the place of meeting, if they desired to vote for Members of Council.

SEPARATION OF PHARMACY FROM THE PRACTICE OF MEDICINE.

Those who are engaged in the several departments connected with the administration of medicine, cannot too carefully or frequently consider their relative positions and the duties they respectively owe to themselves, to each other, and to the public. It is a natural tendency of intellectual development and the advancement of science and art, to promote an extension of the division of labour. With the progress of knowledge, the genus "Jack of all trades" becomes more and more superseded by "Masters of Arts," and the satisfaction experienced in the performance of work by a skilled workman, makes him indisposed to engage in occupations for which he has no adequate qualification. There is ample illustration of this result in the history of the practice of medicine.

The physician, having acquired a general, but to some extent superficial, knowledge of what relates to each department of his profession, takes a special department to the study of which he devotes his particular attention, and by the cultivation of this branch of medical knowledge he seeks and may succeed in attaining to a position of eminence,—one acknowledged by those most competent to judge. But even the pure physician will find the whole range of human diseases too wide to enable him, within the limited space of human experience and with ordinary powers of observation, to attain to equal skill in the treatment of all, and he will derive most satisfaction and credit by applying his powers where they are likely to be productive of the best results.

The surgeon, starting from the same common ground as the physician, takes a different department for special cultivation,—one which partakes more of the nature of an art, and which accomplishes its objects by means and with results that are more obviously related and more generally credited. But here, again, there is found to be room for a division of labour. The operative surgeon, the oculist, the dentist, the accoucheur, are so many separate departments, created by the high cultivation of each. It is no disparagement

to a skilled operator, in any one of these departments, to say that he is comparatively unfitted for others. Practically the more he attains to eminence in one, the less he desires to practise in those for which his attainments have not equally well fitted him.

Again, the pharmacist, if his department be less strictly medical, inasmuch as it does not necessarily require the same general medical foundation as those previously noticed,—if the knowledge involved in the qualification needed for the practice of his department is less comprehensive and more easily acquired than that of the physician or the surgeon, it is, nevertheless, a department involving duties, the efficient performance of which is essential to the successful administration of medicine. The physician who practises pharmacy as well as medicine, will neglect one or attain to eminence in neither. What a relief to the exhausted powers of mind and body, after a day spent in visiting the sick, are the occupations of the dispensary, among dusty pots and bottles! More congenial, perhaps, it might be, and certainly more conducive to the interests of the patient, if the time thus spent were devoted to a quiet retrospect of the experiences of the day, and to communion, through their works, with eminent writers, in cases of doubt or difficulty; but dispensary duties leave little time for this. And, as for the remedies, the choice is limited to what may happen to be the stock-in-trade. This bottle is empty, the contents of that pot are mouldy, and of the other rancid. The grateful aromatic infusion takes too long to make; if particularly required, it must be replaced by a spirituous but vapid and flavourless substitute. New and better remedies there may be; but where are they? The mixture, be it what it may, must serve its purpose; it is subject to no subsequent scrutiny.

Does not the mind, educated and cultivated for the higher walks of the medical profession, trained and qualified for accurate diagnosis, stored with a knowledge of the best established facts in therapeutics, and anxious to test the experiences of others, to enter the field of research, and to enrich its stores in the interests of humanity,—does it not turn from the distasteful drudgery of mixing pills and boluses, and leave with satisfaction the practice of pharmacy to those who, by education and habit, are best fitted to make it a valuable and necessary adjunct of the healing art, providing with skill and supplying faithfully the best known means for alleviating human suffering under disease?

As surgery, in its highest and most perfected departments, has been separated from the general practice of medicine, and has even itself undergone various subdivisions, so has pharmacy been made a distinct occupation or calling. Wherever this separation has been most systematically carried out, means have been devised for enforcing it; but in this country it has been left to the discretion of those who are engaged in the practice of medicine, and to the conventional laws by which professional conduct is controlled. There has, however, been a progressive tendency in favour of this separation for several years past. Many general practitioners have ceased to prepare their own medicines, and have adopted the practice of receiving a fee and writing a prescription. If this system were more generally adopted, we believe it would tend greatly to the interest of all parties concerned; but of course it would be necessary, at the same time, that dispensers should abstain from prescribing. Much has been done, through the efforts of the Pharmaceutical Society, to discourage counter practice among its members. In addition to the force of example and precept, as set forth by the leading and most influential members of the Society, the educational means which have been provided through their instrumentality, have also tended in that direction. We should greatly rejoice to see the same evidence of a determination on the part of chemists and druggists to abstain from prescribing, as we believe there is of

a disposition among general practitioners to abstain from dispensing. The two principal difficulties to be overcome, in order to accomplish the desired object, appear to be, first, that medical men should do as they do abroad, adapt their practice and their fees to the means of their patients; and, secondly, that those engaged in the practice of pharmacy, with a mere pharmaceutical qualification, should wholly abstain from undertaking the treatment of diseases.

NORWICH.

Thanks, well merited and sincere, to the gentlemen of Norwich for their cordial reception and hospitality, brought the proceedings of the fifth session of the British Pharmaceutical Conference to a close.

The value of these annual gatherings, which now form a recognized portion of the pharmaceutist's holiday, can only be duly estimated by those who have shared personally in their enjoyment.

Men of kindred spirit meet together, eager to advance the science and the trade interest of their calling, as well as to cultivate that spirit of kindliness and mutual forbearance which has contributed so large a share in effecting that perfect union which we now possess.

This year the Conference had the joy of knowing that the Society which it to some extent represented, and of which it was the itinerant development, had ceased to be an amateur though excellent organization, was at peace within itself, and rested under the protecting shadow of legislation. The members were not slow to acknowledge their obligation to those who with equal skill and patience had laboured successfully to accomplish so happy a result.

To the mere visitor the sight of an ancient city, rich in historical associations, crowded with noble specimens of the architecture of the past, and not unknown as one of the chosen seats of learning, would more than compensate for that small subscription which some have quietly forgotten.

To the student and the Pharmaceutist another attraction was presented—all felt as they listened to the lucid exposition of modern discovery which the address contained, that they had shown great discretion in the selection of their chief.

We may congratulate the President that while not ignoring that branch of Science with which his name is usually connected, he was content to wander into other paths, and give his audience a summary of recent investigations. It would be invidious and foreign to our task to criticize the various papers which were read during two successive days, part of which will be found printed in another portion of this Journal. Still we shall not be charged with indiscretion in making an exception in favour of Mr. Stoddart's communication on "Lemon Juice and its Decompositions." To say that it was specially in keeping with the design of the Association, that it bore evidence of research directly practical and scientific, is to confirm the universal opinion of the hearers.

Next year it is in contemplation to enroll a few American and Continental friends; but while the Conference thus seeks to extend its operations, let us not forget the present good—such an institution is an unmixed benefit to the visitors and the visited. To both alike it proves a welcome and much needed stimulus; both largely extend their social circle, and gain an insight into modes of working other, often better, than their own; both lose unconsciously the rough angles which disfigure them, learn to respect each other, and exercise the charity of thought and act.

Surely the guild of Pharmacy has reason to rejoice in the establishment and prosperity of the British Pharmaceutical Conference.

TRANSACTIONS

OF

THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *August 5th*, 1868,

Present—Messrs. Abraham, Bottle, Bourdas, Carteighe, Evans, Haselden, Hills, Ince, Morson, Sandford, Savage, Squire, and Williams,

The following were elected

MEMBERS.

Claypole, Alfred Hughes .....York Town.
Hopgood, Richard Cooper.....Chipping Norton.
Sandall, William .....Northampton.

The following having paid their arrears of subscription were restored to Membership :—

Gigner, John .....London.
Rayner, William.....Sheerness.
Watkins, John .....London.

The Professors having presented their Reports on their respective classes and the results of their Examinations for prizes at the end of the Past Session,
The following awards were declared:—

LECTURES.

CHEMISTRY AND PHARMACY.

MEDAL .....John Moss.
„ .....Alfred Neobard Palmer.
CERTIFICATE OF HONOUR ...John Thomas Ward Wallis.

BOTANY AND MATERIA MEDICA.

MEDAL .....John Moss.
CERTIFICATE OF HONOUR ...James Deane.
CERTIFICATE OF MERIT... ...John Thomas Ward Wallis.

LABORATORY.

PRACTICAL CHEMISTRY.

MEDAL .....William Arkinstall.
CERTIFICATE OF HONOUR ...Alfred Franklin.
„ „ ...Alfred Neobard Palmer.

JACOB BELL SCHOLARSHIPS.

The Board of EXAMINERS presented their Report on the Examination for these Scholarships.
The following awards were made:—

SENIOR .....John Moss.
JUNIOR .....John Ingham.

The Board also presented their Report on the Examination for the Pereira Medal (Major Examination), and the Prize of Books (Minor Examination).

The **PEREIRA MEDAL** was awarded to

Frank Harwood Lescher.

The PRIZE OF BOOKS was awarded to

Matthew Henry Stiles.

The Professor of Botany reported on the Herbaria received in competition for the Botanical Prize.

The following awards were made:—

BRONZE MEDAL.....Washington Gimblett.
CERTIFICATE OF HONOUR.....Martin Luther Clift.
CERTIFICATE OF MERIT .....Joseph Butten.

The Medals and Certificates will be distributed at the Evening Meeting, on the 7th October next, when the successful competitors will be expected to attend. An inaugural address by Mr. H. B. Brady, of Newcastle, will be delivered to the students of the session. Ladies will be admitted.

ERRATUM.—In August number, p. 55, Major Examination, prefix * to "Cocks, John Walter."

BENEVOLENT FUND.

The sum of Ten Pounds (second grant) was given to a Member residing in London.
The sum of Ten Pounds (third grant) was given to the Widow of a late Member residing in London.

PROPOSED REGULATIONS OF THE BOARD OF EXAMINERS.

The following proposed Regulations for the MODIFIED EXAMINATION for Assistants under the Pharmacy Act, 1868, have been submitted to the Privy Council.

"Candidates will be examined in the following subjects:—

"PRESCRIPTIONS.

"Candidates will be required to read Autograph Prescriptions, translate them into English, render a correct Translation of the Directions for Use, and detect Unusual Doses.

"PRACTICAL DISPENSING.

"To weigh, measure, and compound Medicines, write the Directions in suitable language, finish and properly direct each Package.

"MATERIA MEDICA AND QUALITY OF SPECIMENS.

"To recognize the Pharmacopœia Chemicals in frequent demand, and specimens of Roots, Barks, Leaves, Fruits, Resins, and Gums in ordinary use; the following Plants, either in a fresh or dried state, or from plates:—Belladonna, Stramonium, Hyoscyamus, Conium, Aconitum, Digitalis, and Sabina; also to estimate the quality of each specimen submitted and its freedom from adulteration.

"PHARMACY.

"To recognize the Preparations of the Pharmacopœia which are not of a definite Chemical Nature, such as Extracts, Tinctures, and Powders, and give the proportions of the more active ingredients."

AN ACT TO REGULATE THE SALE OF POISONS, AND ALTER AND AMEND THE PHARMACY ACT, 1852.

[31*st July*, 1868.]

Whereas it is expedient for the safety of the public that persons keeping open shop for the retailing, dispensing, or compounding of poisons, and persons known as Chemists and Druggists, should possess a competent practical knowledge of their business, and to that end, that from and after the day herein named all persons not already engaged in such business should, before commencing such business, be duly examined as to their practical knowledge, and that a register should be kept as herein provided, and also that the Act passed in the 15th and 16th years of the reign of her present Majesty, intituled "An Act for Regulating the Qualification of Pharmaceutical Chemists," hereinafter described as the Pharmacy Act, should be amended: be it enacted, by the Queen's Most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal and Commons in this present Parliament assembled, and by authority of the same, as follows:— 15 & 16 Vict. c. 56.

1. From and after the 31st day of December, 1868, it shall be unlawful for any person to sell or keep open shop for retailing, dispensing, or compounding poisons, or to assume or use the title "Chemist and Druggist" or Chemist or Druggist, or Pharmacist, or Dispensing Chemist, or Druggist, in any part of Great Britain, unless such person shall be a Pharmaceutical Chemist, or a Chemist and Druggist within the meaning of this Act, and be registered under this Act, and conform to such regulations as to the keeping, dispensing, and selling of such poisons as may from time to time be prescribed by the Pharmaceutical Society with the consent of the Privy Council. Persons selling or compounding Poisons, or assuming the title of Chemist and Druggist, to be qualified.

2. The several articles named or described in the schedule (A) shall be deemed to be Poisons within the meaning of this Act, and the Council of the Pharmacentical Society of Great Britain (hereinafter referred to as the Pharmaceutical Society) may from time to time, by resolution, declare that any article in such resolution named ought to be deemed a poison within the meaning of this Act; and thereupon the said Society shall submit the same for the approval of the Privy Council, and if such approval shall be given, then such resolution and approval shall be advertised in the "London Gazette," and on the expiration of one month from such advertisement the article named in such resolution shall be deemed to be a poison within the meaning of this Act. Articles named in schedule (A) to be deemed Poisons within the meaning of this Act.

3. Chemists and Druggists within the meaning of this Act shall consist of all persons who, at any time before the passing of this Act, have carried on, in Great Britain, the business of a Chemist and Druggist, in the keeping of open shop for the compounding of the prescriptions of duly qualified medical practitioners, also of all Assistants and Associates who, before the passing of this Act, shall have been duly registered under or according to the provisions of the Pharmacy Act, and also of all such persons as may be duly registered under this Act. Chemists and Druggists within meaning of this Act.

Assistants to be registered.

4. Any person who, at the time of the passing of this Act, shall be of full age, and shall produce to the Registrar on or before the 31st day of December, 1868, certificates, according to schedule (E) to this Act, that he had been for a period of not less than three years actually engaged and employed in the dispensing and compounding of prescriptions as an assistant to a Pharmaceutical Chemist, or to a Chemist and Druggist as defined by Clause 3 of this Act, shall, on passing such a modified examination as the Council of the Pharmaceutical Society with the consent of the Privy Council may declare to be sufficient evidence of his skill and competency to conduct the business of a Chemist and Druggist, be registered as a Chemist and Druggist under this Act.

Registration of Chemists and Druggists.

5. The persons who at the time of the passing of this Act shall have been duly admitted Pharmaceutical Chemists, or shall be Chemists and Druggists within the meaning of the Act, shall be entitled to be registered under the Act without paying any fee for such registration: Provided, however, as regards any such Chemist and Druggist, that his claim to be registered must be by notice in writing, signed by him and given to the Registrar with certificates according to the schedules (C) and (D) to this Act; and provided also, that for any such registration of a Chemist and Druggist, unless it be duly claimed by him on or before the 31st day of December, 1868, the person registered shall pay the same fee as persons admitted to the Register after examination under this Act.

Examiners under Pharmacy Act to be the Examiners under this Act.

6. All such persons as shall from time to time have been appointed to conduct examinations under the Pharmacy Act, shall be, and are hereby declared to be examiners for the purposes of this Act, and are hereby empowered and required to examine all such persons as shall tender themselves for examination under the provisions of this Act, and every person who shall have been examined by such examiners, and shall have obtained from them a certificate of competent skill and knowledge and qualification, shall be entitled to be registered as a Chemist and Druggist under this Act, and the examination aforesaid shall be such as is provided under the Pharmacy Act for the purposes of a qualification to be registered as Assistant under that Act, or as the same may be varied from time to time by any Bye-law to be made in accordance with the Pharmacy Act as amended by this Act: provided that no person shall conduct any examination for the purposes of this Act until his appointment has been approved by the Privy Council; and such appointment and approval shall not in any case be in force for more than five years; moreover, it shall be the duty of the said Pharmaceutical Society to allow any officer appointed by the said Privy Council to be present during the progress of any examination held for the purposes of this Act.

Certificate of competent skill, etc.

Application of fees to purpose of Pharmaceutical Society.

7. Upon every such examination and registration as aforesaid such fees shall be payable as shall from time to time be fixed and determined by any Bye-law, to be made in accordance with the Pharmacy Act as amended by this Act, and shall be paid to the Treasurer of the said Society for the purposes of the said Society.

Registrar under Pharmacy Act to be so under this Act.

8. The registrar appointed, or to be appointed, under or by virtue of the Pharmacy Act, shall be registrar for the purposes of this Act.

Council of Pharmaceutical Society

9. The Council of the Pharmaceutical Society shall, with all convenient speed, after the passing of this Act, and from time to time, as occasion may require, make orders or regulations for regulating

the register, to be kept under this Act as nearly as conveniently may be in accordance with the form set forth in the schedule (B) to this Act, or to the like effect, and such register shall be called the Register of Chemists and Druggists.

to make orders for regulating Register to be kept.

10. It shall be the duty of the Registrar to make and keep a correct register, in accordance with the provisions of this Act, of all persons who shall be entitled to be registered under this Act, and to erase the names of all registered persons who shall have died, and from time to time to make the necessary alterations in the addresses of the persons registered under this Act; to enable the Registrar duly to fulfil the duties imposed upon him, it shall be lawful for the Registrar to write a letter to any registered person, addressed to him according to his address on the register, to inquire whether he has ceased to carry on business or has changed his residence,—such letter to be forwarded by post as a registered letter, according to the Post-Office regulations for the time being, and if no answer shall be returned to such letter within the period of six months from the sending of the letter, a second, of similar purport, shall be sent in like manner, and if no answer be given thereto within three months from the date thereof, it shall be lawful to erase the name of such person from the register, provided always that the same may be restored by direction of the Council of the Pharmaceutical Society, should they think fit to make an order to that effect.

Duty of Registrar to make and keep Register.

11. Every Registrar of Deaths in Great Britain, on receiving notice of the death of any Pharmaceutical Chemist, or Chemist and Druggist, shall forthwith transmit, by post, to the Registrar under the Pharmacy Act, a certificate, under his own hand, of such death, with the particulars of the time and place of death, and on the receipt of such certificate, the said Registrar under the Pharmacy Act shall erase the name of such deceased Pharmaceutical Chemist, or Chemist and Druggist, from the register, and shall transmit to the said Registrar of deaths the cost of such certificate and transmission, and may charge the cost thereof as an expense of his office.

Notice of death of Pharmaceutical Chemist or Chemist and Druggist to be given by Registrars.

12. No name shall be entered in the register, except of persons authorized by this Act to be registered, nor unless the Registrar be satisfied by the proper evidence, that the person claiming is entitled to be registered; and any appeal from the decision of the Registrar may be decided by the Council of the Pharmaceutical Society; and any entry which shall be proved to the satisfaction of such Council to have been fraudulently or incorrectly made, may be erased from or amended in the Register, by order, in writing, of such Council.

Evidence of qualification to be given before registration.

13. The Registrar shall, in the month of January in every year, cause to be printed, published, and sold, a correct register of the names of all Pharmaceutical Chemists, and a correct register of all persons registered as Chemists and Druggists, and in such registers, respectively, the names shall be in alphabetical order, according to the surnames, with the respective residences, in the form set forth in Schedule B to this Act, or to the like effect, of all persons appearing on the Register of Pharmaceutical Chemists, and on the Register of Chemists and Druggists, on the 31st day of December last preceding, and such printed registers shall be called 'The Registers of Pharmaceutical Chemists and Chemists and Druggists,' and a printed copy of such registers for the time being, purporting to be so printed and published as aforesaid, or any

Annual Register to be published and be evidence.

certificate under the hand of the said Registrar, and countersigned by the President or two Members of the Council of the Pharmaceutical Society, shall be evidence in all Courts and before all Justices of the Peace and others, that the persons therein specified are registered according to the provisions of the Pharmacy Act or of this Act, as the case may be, and the absence of the name of any person from such printed register shall be evidence, until the contrary shall be made to appear, that such person is not registered according to the provisions of the Pharmacy Act or of this Act.

Penalty on wilful falsification of Register, or for obtaining registration by false representation.

14. Any Registrar who shall wilfully make or cause to be made any falsification in any matter relating to the said registers, and any person who shall wilfully procure or attempt to procure himself to be registered under the Pharmacy Act or under this Act, by making or producing or causing to be made or produced any false or fraudulent representation or declaration, either verbally or in writing, and any person aiding or assisting him therein, shall be deemed guilty of a misdemeanour in England, and in Scotland of a crime or offence punishable by fine or imprisonment, and shall on conviction thereof be sentenced to be imprisoned for any term not exceeding twelve months.

Protection of titles and restrictions on sale of poisons.

15. From and after the 31st day of December, 1868, any person who shall sell, or keep an open shop for the retailing, dispensing, or compounding poisons, or who shall take, use, or exhibit the name or title of Chemist and Druggist or Chemist or Druggist, not being a duly registered Pharmaceutical Chemist or Chemist and Druggist, or who shall take, use, or exhibit, the name or title Pharmaceutical Chemist, Pharmaceutist, or Pharmacist, not being a Pharmaceutical Chemist, or shall fail to conform with any regulation as to the keeping or selling of poisons, made in pursuance of this Act, or who shall compound any medicines of the British Pharmacopœia, except according to the formularies of the said Pharmacopœia, shall, for every such offence, be liable to pay a penalty or sum of five pounds, and the same may be sued for, recovered, and dealt with in the manner provided by the Pharmacy Act for the recovery of penalties under that Act; but nothing in this Act contained shall prevent any person from being liable to any other penalty, damages, or punishment, to which he would have been subject if this Act had not passed.

Reserving rights of certain persons.

16. Nothing hereinbefore contained shall extend to or interfere with the business of any legally qualified apothecary or of any member of the Royal College of Veterinary Surgeons of Great Britain, nor with the making or dealing in patent medicines, nor with the business of wholesale dealers in supplying poisons in the ordinary course of wholesale dealing; and upon the decease of any Pharmaceutical Chemist or Chemist and Druggist actually in business at the time of his death, it shall be lawful for any executor, administrator, or trustee of the estate of such Pharmaceutical Chemist or Chemist and Druggist to continue such business if and so long only as such business shall be *bonâ fide* conducted by a duly qualified Assistant; and a duly qualified assistant, within the meaning of this clause, shall be a Pharmaceutical Chemist or a Chemist and Druggist registered by the Registrar under the Pharmacy Act or this Act; provided always, that registration under this Act shall not entitle any person so registered to practise medicine or surgery, or any branch of medicine or surgery.

Regulations to be observed in the

17. It shall be unlawful to sell any poison, either by wholesale or by retail, unless the box, bottle, vessel, wrapper, or cover in which

such poison is contained, be distinctly labelled with the name of the article and the word poison, and with the name and address of the seller of the poison; and it shall be unlawful to sell any poison of those which are in the first part of schedule (A) to this Act, or may hereafter be added thereto under section 2 of this Act, to any person unknown to the seller, unless introduced by some person known to the seller, and on every sale of any such article the seller shall, before delivery, make or cause to be made an entry in a book to be kept for that purpose, stating, in the form set forth in schedule (F) to this Act, the date of the sale, the name and address of the purchaser, the name and quantity of the article sold, and the purpose for which it is stated by the purchaser to be required, to which entry the signature of the purchaser and of the person, if any, who introduced him, shall be affixed; and any person selling poison otherwise than is herein provided, shall, upon a summary conviction before two Justices of the Peace in England or the Sheriff in Scotland, be liable to a penalty not exceeding five pounds for the first offence, and to a penalty not exceeding ten pounds for the second or any subsequent offence; and for the purposes of this section the person on whose behalf any sale is made by any apprentice or servant shall be deemed to be the seller, but the provisions of this section, which are solely applicable to poisons in the first part of the schedule (A) to this Act, or which require that the label shall contain the name and address of the seller, shall not apply to articles to be exported from Great Britain by wholesale dealers, nor to sales by wholesale to retail dealers in the ordinary course of wholesale dealing, nor shall any of the provisions of this section apply to any medicine supplied by a legally qualified apothecary to his patient, nor apply to any article when forming part of the ingredients of any medicine dispensed by a person registered under this Act, provided such medicine be labelled in the manner aforesaid with the name and address of the seller, and the ingredients thereof be entered, with the name of the person to whom it is sold or delivered, in a book to be kept by the seller for that purpose, and nothing in this Act contained shall repeal or affect any of the provisions of an Act of the Session holden in the fourteenth and fifteenth years in the reign of her present Majesty, intituled 'An Act to regulate the Sale of Arsenic.' Sale of Poisons.

18. Every person who, at the time of the passing of this Act, is or has been in business on his own account as a Chemist and Druggist as aforesaid, and who shall be registered as a Chemist and Druggist, shall be eligible to be elected and continue a member of the Pharmaceutical Society according to the Bye-laws thereof; but no person shall, in right of membership acquired pursuant to this clause, be placed on the Register of Pharmaceutical Chemists, nor, save as is hereinafter expressly provided, be eligible for election to the Council of the Pharmaceutical Society. Chemists and Druggists in business prior to passing of Act eligible for election as Members of Pharmaceutical Society.

19. Every person who is or has been in business on his own account as a Chemist and Druggist as aforesaid at the time of the passing of this Act, and who shall become a Member of the Pharmaceutical Society, shall be eligible for election to the Council of the Pharmaceutical Society; but the said Council shall not at any time contain more than seven Members who are not on the Register of Pharmaceutical Chemists. Council of Pharmaceutical Society.

20. Every person who shall have been registered as a Chemist and Druggist under this Act, by reason of having obtained a certificate of qualification from the Board of Examiners, shall be eligible to be Chemists and Druggists registered eli-

gible to be elected Associates, and being in business, have the privilege of voting in the Society, on paying the same subscriptions as Members.

elected an Associate of the Pharmaceutical Society, and every such person so elected and continuing as such Associate, being in business on his own account, shall have the privilege of attending all meetings of the said Society and of voting thereat, and otherwise taking part in the proceedings of such meetings, in the same manner as Members of the said Society; provided always, that such Associates contribute to the funds of the said Society the same Fees or Subscriptions as Members contribute for the time being under the Bye-laws thereof.

Voting-papers for election of Council.

21. At all meetings of the Pharmaceutical Society at which votes shall be given for the election of officers, all or any of the votes may be given either personally or by voting-papers, in a form to be defined in the Bye-laws of the said Society, or in a form to the like effect, such voting-papers being transmitted under cover to the Secretary, not less than one clear day prior to the day on which the election is to take place.

Benevolent Fund may be applied to past Members and Associates, also to Pharmaceutical Chemists and registered Chemists and Druggists.

22. And whereas by the Charter of Incorporation of the said Pharmaceutical Society it is provided that the Council of the said Society shall have the sole control and management of the real and personal property of the said Society, subject to the Bye-laws thereof, and shall make provision thereout, or out of such part thereof as they shall think proper for the relief of the distressed Members or Associates of the said Society, and their widows and orphans, subject to the regulations and Bye-laws of the said Society. And whereas, for extending the benefits which have resulted from the said provision in the said Charter of Incorporation, it is desirable that additional power should be granted to the said Council, be it enacted that from and after the passing of this Act, the said Council may make provision out of the real and personal property aforesaid, and out of any special fund, known as the Benevolent Fund, not only for the relief of the distressed Members or Associates of the said Society and their widows and orphans, subject to the said regulations and Bye-laws, but also for all persons who may have been and have ceased to be Members or Associates of the said Society, or who may be or have been duly registered as "Pharmaceutical Chemists" or "Chemists and Druggists," and the widows and orphans of such persons, subject to the regulations and Bye-laws of the said Society.

Registration under Medical Act.

23. Persons registered under 'The Medical Act' shall not be or continue to be registered under this Act.

Adulteration of Food or Drink Act to extend to Medicines.

24. The provisions of the Act of the twenty-third and twenty-fourth of Victoria, chapter eighty-four, intituled "An Act for Preventing the Adulteration of Articles of Food or Drink," shall extend to all articles usually taken or sold as medicines, and every adulteration of any such article shall be deemed an admixture injurious to health; and any person registered under this Act, who sells any such article adulterated, shall, unless the contrary be proved, be deemed to have knowledge of such adulteration.

Acts of Privy Council.

25. On and after the passing of this Act, all powers vested by the Pharmacy Act in one of her Majesty's Principal Secretaries of State, shall be vested in the Privy Council, and the seventh section of the Public Health Act, 1858, shall apply to all proceedings and acts of the Privy Council herein authorized.

Power to Privy Council to erase names of persons from Register.

26. The Privy Council may direct the name of any person who is convicted of any offence against this Act, which, in their opinion, renders him unfit to be on the register under this Act, to be erased from such register; and it shall be the duty of the Registrar to erase the same accordingly.

27. This Act shall not extend to Ireland.
28. This Act may be cited as the Pharmacy Act, 1868. Short Title.

SCHEDULES.

Schedule (A).

Part 1.

Arsenic and its preparations.
Prussic Acid.
Cyanides of Potassium and all metallic cyanides.
Strychnine, and all poisonous vegetable alkaloids and their salts.
Aconite and its preparations.
Emetic Tartar.
Corrosive Sublimate.
Cantharides.
Savin and its Oil.
Ergot of Rye and its preparations.

Part 2.

Oxalic Acid.
Chloroform.
Belladonna and its preparations.
Essential Oil of Almonds, unless deprived of its Prussic Acid.
Opium and all preparations of Opium or of Poppies.

Schedule (B).

Name.	Residence.	Qualification.
A. B.	Oxford Street, London.	In business prior to Pharmacy Act, 1868.
C. D.	George Street, Edinburgh.	Examined and certified.
E. F.	Cheapside, London.	Assistant prior to Pharmacy Act, 1868.

Schedule (C).

Declaration by a person who was in business as a Chemist and Druggist in Great Britain before the Pharmacy Act, 1868.

To the Registrar of the Pharmaceutical Society of Great Britain.

I, , residing at , in the county of , hereby declare that I was in business as a Chemist and Druggist in the keeping of open shop for the compounding of the prescriptions of duly qualified medical practitioners at , in the county of , on or before the day of , 186 .

Signed (Name.)

Dated this day of , 18 .

Schedule (D).

Declaration to be signed by a duly qualified Medical Practitioner, or Magistrate, respecting a person who was in business as a Chemist and Druggist in Great Britain before the Pharmacy Act, 1868.

To the Registrar of the Pharmaceutical Society of Great Britain.

I residing at , in the county of , hereby declare that I am a duly qualified Medical Practitioner [*or* Magistrate], and that to my knowledge , residing at in the county of , was in business as a Chemist and Druggist, in the keeping of open shop for the compounding of the prescriptions of duly qualified Medical Practitioners, before the day of , 186 .

(*Signed*)

Schedule (E).

Declarations to be signed by and on behalf of any Assistant claiming to be registered under the Pharmacy Act, 1868.

To the Registrar of the Pharmaceutical Society of Great Britain.

I hereby declare that the undersigned , residing at , in the county of , had for three years immediately before the passing of the Pharmacy Act, 1868, been employed in dispensing and compounding prescriptions, as an Assistant to a Pharmaceutical Chemist or Chemist and Druggist, and attained the age of twenty-one years.

As witness my hand, this day of 186 .

A. B., duly qualified Medical Practitioner.
C. D., Pharmaceutical Chemist.
E. F., Chemist and Druggist.
G. H., Magistrate.

(*To be signed by one of the four parties named.*)

I hereby declare that I was an Assistant to of in the county of in the year , and was for three years immediately before the passing of this Act actually engaged in dispensing and compounding prescriptions, and that I had attained the full age of twenty-one years at the time of the passing of the Pharmacy Act, 1868.

N. O., Assistant.

Schedule (F).

Date.	Name of Purchaser.	Name and Quantity of Poison sold.	Purpose for which it is required.	Signature of Purchaser.	Signature of Person introducing Purchaser.

BRITISH PHARMACEUTICAL CONFERENCE.

MEETING AT NORWICH.

First Sitting.

The meetings of the British Pharmaceutical Conference for the year 1868, were opened at the Lecture Hall, St. Andrew's, Norwich, on Tuesday, August 18th, at 10 A.M. The President, Daniel Hanbury, Esq., F.R.S., etc. occupied the chair. The room, provided by the Local Committee, was large and well adapted for the purpose, whilst the adjoining Hall was devoted to the Exhibition of objects relating to Pharmacy, a detailed description of which will be given hereafter. The following delegates were present, viz. Mr. Abraham, from the Liverpool Chemists' Association; Mr. Reynolds, from the Leeds Chemists' Association; and Mr. Atherton, from chemists of Nottingham.

Communications expressive of sympathy with the purpose of the Conference were presented from the Honorary Secretaries of the following Societies, viz.:—The Chemists' Associations of Bath, Dundee, Glasgow, Sheffield, York; and the Chemists' Assistants' Associations of London, and Bristol and Clifton. The attendance of members was good, the following being present at this, or some of the following sittings, viz.:—Professor Attfield, Messrs. D. Hanbury, Deane, H. S. Evans, Ince, Carteighe, Bremridge, Brough, Gale, Greenish, Grainger, Watts, Francis, W. L. Scott, Watson, and Coleman, London; R. Parkinson, Ph.D., Bradford; Mr. Savage, Brighton; Mr. Clayton, Birmingham; Mr. Stoddart, Bristol; Mr. Gostling and Mr. Francis, jun., Diss; Mr. Muskett, Harleston; Mr. Schacht, Clifton; Mr. Chifney, Mildenhall; Mr. Brady, Newcastle-upon-Tyne; Mr. Groves, Weymouth; Mr. Lenton, East Dereham; Mr. Baker, Swaffham; Mr. Bell, Hull; Mr. J. R. King, Bath; Mr. Kinninmont and Mr. Stanford, Glasgow; Mr. Guyer, Torquay; Messrs. Arnold, Bridgman, Butler, Caley, Corder, Cossey, G. Cubitt, C. Cubitt, Fitch, Gardiner, Peggs, R. C. Pitts, Row, Searby, J. D. Smith, R. B. Smith, F. D. Smith, Sutton, Thompson, and J. Watson, all of Norwich; Mr. Atherton, Nottingham, etc. etc.

The following new members were elected at this or subsequent sittings by the method adopted in previous years, the President being requested by a resolution of the meeting to deposit a ballot for the entire list.

Arrow, Mr. J., 174, Warwick Street, Pimlico, S.W.
Bailey, Mr. W., Horseley Fields Chemical Works, Wolverhampton.
Baker, Mr. G., Geneva.
Baker, Mr. P. C., Swaffham.
Bateman, Mr. T. H. M., 27, Manbey Grove, Stratford, E.
Bell, Mr. C. B., 6, Spring Bank, Hull.
Bennett, F. J., M.D., etc., Wilton, Salisbury.
Beynon, Mr. E., 143, New Bond St., W.
Billing, Mr. T., 143, New Bond St., W.
Bird, Mr. W. S., Magdalen Street, Norwich.
Blacklock, Mr. J. D., Old Steine, Brighton.
Bond, Mr. J., Great Yarmouth.
Botham, Mr. J., Broughton, Manchester.
Brew, Mr. T. A., East Street, Brighton.
Bridgman, Mr. W.K., St. Giles, Norwich.
Burn, Mr. J., Church Lane, Hull.
Burton, Mr. J., 397, Cambridge Road, N.E.
Butland, Mr., Sidwell Street, Exeter.
Butler, Mr. W. J. G., 2, London Street, Norwich.
Cargill, Mr. R., 32, Marine Parade, Brighton.
Chifney, Mr. G., Mildenhall, Suffolk.
Clowes, Mr. W. C., Attleborough.
Cole, Mr. F., 4, High Street, Stoke Newington.
Coleman, Mr. A., 13, St. Mary-at-Hill, E.C.
Colley, Mr. J., sen., 101, Western Road, Brighton.
Cooke, Mr. W., St. Giles, Norwich.
Cooper, Mr. S., 101, Fore Street, Exeter.
Corder, Mr. O., 2, London St., Norwich.
Cornish, Mr. W., 174, Western Road, Brighton.
Cossey, Mr. J., St. John's, Norwich.

Cox, Mr. H., Strutton Ground, Westminster.
Crotch, Mr. J., 31, Edgware Road, W.
Cubitt, Mr. C., Market Place, Norwich.
Cubitt, Mr. G., The Walk, Norwich.
Cubley, Mr. G. A., Sheffield.
Cunliffe, Mr. N., Crook Street, Bolton.
Cupiss, Mr. F., Diss.
Currie, Mr. J., 70, Eglinton St., Glasgow.
Davison, Mr. T., 95, St. Vincent Street, Glasgow.
Davy, Mr. F., Great Yarmouth.
Dearden, Mr. W., Blackburn Street, Bolton.
Dowling, Mr., High Street, Exeter.
Dun, Mr. R. T., 288, Argyle St., Glasgow.
Evans, Mr. A., Fore Street, Exeter.
Floyd, Mr. J., Soham.
Francis, Mr. G. Bult, Diss.
Gardiner, Mr. J., London St., Norwich.
Gibson, Mr. C. P., Whitefriargate, Hull.
Gooch, Mr. W. P., 22, Hamilton Terrace East, Highbury, N.
Gostling, Mr. T. P., Diss.
Greenish, Mr. T., 20, New Street, Dorset Square, N.W.
Hampson, Mr. P., Great Moore Street, Bolton.
Harrison, Mr. G. H., High Street, Sheffield.
Heard, Mr., Rougemont Terrace, Exeter.
Heppell, Mr. H., 116, Tottenham Court Road.
Hick, Mr. A., Wath-on-Dearne.
Hill, Mr. A. B., 11, Little Britain, E.C.
Howden, Mr. R., Gracechurch St., E.C.
Howell, Mr. M., 61, High Street, Peckham, S.E.
Husband, Mr., 101, Fore Street, Exeter.
Jaap, Mr. J., 268, Buchanan St., Glasgow.
Knapman, Mr., High Street, Exeter.
Lake, Mr., High Street, Exeter.
Lees, Mr. J., 2, Upper Street, Islington, N.
Lenton, Mr. W. H., East Dereham.
Long, Mr., 34, Western Road, Hove, Brighton.
M'Donald, Mr. R., Dunkeld.
M'Gregor, Mr. A., 47, Eglinton Street, Glasgow.
M'Millar, Mr. J., 9, Great Western Road, Glasgow.
Martin, Mr. F. R., Southampton Parade, Redland, Bristol.
Mellin, Mr., Wimbledon.
Mitchell, Mr. J., 34, Virginia St., Glasgow.
Moffat, Mr. T. D., 3, Union St., Glasgow.
Monkhouse, Mr. J., (Mr. Sampson's,) Southport.
Muskett, Mr. J., Harleston, Norfolk.
Napier, Mr. G. L., 40, South Street, Exeter.
Nicholson, Mr. S., Aylsham, Norfolk.
Owles, Mr. J., Great Yarmouth.
Owles, Mr. J. J., Great Yarmouth.
Palk, Mr. J., Southernhay, Exeter.
Pass, Mr. H., Wandsworth Road, S.
Peggs, Mr. J. O., Golden Ball Street, Norwich.
Phillips, Mr. J., 154, Marine Parade, Brighton.
Pitts, Mr. R. B., St. Giles, Norwich.
Pitts, Mr. R. C., St. Giles, Norwich.
Poingdestre, Mr. C. R., 1, Park Street, Regent's Park, N.W.
Poll, Mr. W. S., Yarmouth, Norfolk.
Preston, Mr. J., Sheffield.
Priestley, Mr. J., Deansgate, Bolton.
Quarrington, Mr., Bath.
Readwin, T. A., F.C.S., Brixton.
Robinson, Mr. J., Orford Hill, Norwich.
Roddam, Mr. H. R., Ropery Banks, North Shields.
Row, Mr. G., St. Stephen's, Norwich.
Rose, Mr. A., 441, Edgware Road, W.
Russell, Mr. C. J. D., Windsor.
Salmon, Mr., 30, Western Road, Hove, Brighton.
Schweitzer, Mr., King's Road, Brighton.
Searby, Mr. W., White Lion Street, Norwich.
Shaw, Mr. J., Great George Street, Liverpool.
Smith, Mr. E., 8, The Strand, Torquay.
Smith, Mr. F. D., Magdalen Street, Norwich.
Smith, Mr. J. D., Magdalen Street, Norwich.
Smith, Mr. R., Market Place, Norwich.
Smith, Mr. W., 83, Western Road, Brighton.
Stockings, Mr. A., St. Stephen's, Norwich.
Sumner, Mr. R., Lord Street, Liverpool.
Sutton, Mr. C. H., Stowmarket.
Tanner, Mr., High Street, Exeter.
Taylor, Mr. R., Paradise House, Oxford.
Thompson, Mr. H., St. Stephen's, Norwich.
Tighe, Mr., High Street, Exeter.
Wade, Mr. W., 1, Jermyn Street, S.W.
Walbon, Mr. R., (Holman and Ham,) High Street, Exeter.
Watkins, Mr. R. Timarn, Canterbury, New Zealand.
Watson, Mr. G. P., King Street, Norwich.
Watson, Mr. J., Rose Lane, Norwich.

Waugh, Mr. G., 177, Regent Street, W.
White, Mr. J., 20, Paterson St., Glasgow.
Woolley, Mr., H., 69, Market Street, Manchester.
Wootton, Mr. A. C., 1, Bloomsbury Square, W.C.
Young, Mr. W., 116, Balls Pond Road, N.

Apologies for non-attendance were presented from Mr. Sandford, Professor Bentley, Mr. Bruce Warren, Mr. J. C. Braithwaite, and Mr. Heathfield, London; Mr. Mackay and Mr. Young, Edinburgh; Mr. Barnitt, Bath; Mr. Sumner, Liverpool; Mr. Giles, Clifton, and Mr. Yewdall, Leeds.

Mr. H. S. Evans, Vice-President of the Pharmaceutical Society, expressed on behalf of Mr. Sandford, the President, his regret that he was unavoidably prevented from leaving London at that time. Mr. Sutton, as Local Secretary of the Conference, read extracts from a letter sent by Mr. Sandford, to the following effect:—

"I have always regarded the Conference as an admirable offshoot of the Pharmaceutical Society, perhaps I might more properly call it an 'outburst,' for I do not claim any credit for the Society in establishing the Conference, although I consider the relationship between them as very intimate. I think the early promoters of the Conference hailed from Bloomsbury Square, and imbibed much of their love of pharmacy, elevated into a science in England by the Pharmaceutical Society, and a good deal of their spirit of union therefrom. I should like to see the Act of Parliament, we have just obtained, carried into effect, not simply by our being a body of men held together by registration, but also an association of individuals acting towards each other, and the public, in the spirit of that admirable paper read by my friend Ince at Nottingham, on 'Pharmaceutical Ethics.'"

Professor Attfield read the following:—

"REPORT OF THE EXECUTIVE COMMITTEE.

"The President and Committee again congratulate the Members on the increasing strength and usefulness of the Conference. Since the last annual meeting the ranks of our Association have been swelled by the addition of 121 names, 39 of which have been contributed by Norwich and the neighbouring district. Six gentlemen have withdrawn, the total number of members now being 562.

"In connection with the meeting for 1867, it is gratifying to the Committee to be able to record that the unanimity with which the Dundee chemists welcomed the Conference did not cease with its visit, but formed a basis on which has been founded a local society for mutual advantage and improvement. Papers have been read, and trade matters discussed, at its meetings, and other occasions of good fellowship observed. This is not the first time that the annual meeting of the Conference has formed an opportunity for a public expression of brotherly feeling and goodwill, and a development of Pharmaceutical science, on the part of the chemists of a town such as should tend to their permanent elevation as well as the advancement of pharmacy generally.

"In connection with the present meeting the Committee has endeavoured, by the issue of an extended list of subjects suggested for investigation, by mutual help, and by aid of the gentlemen who have independently worked on various questions, to provide sufficient papers to occupy, and not more than occupy the two days preceding the sectional meetings of the British Association. The exhibition of new chemicals, drugs, apparatus, and other things connected with Pharmacy, which has been organized entirely by the Norwich Local Committee, will form an interesting feature of the gathering throughout the whole week.

"Every well-wisher of Pharmacy, and indeed every one interested in the public welfare must rejoice at the success which has recently crowned long years of effort in the direction of Pharmaceutical legislation. The amount of skill and ability with which the Pharmaceutical Chemist, or Chemist and Druggist of the future, shall discharge his duties will depend now on the efficiency of a Board of Examiners, appointed indirectly by chemists and druggists themselves. The best interests of prescribers, dispensers, and patients, can alone be secured by demanding, sooner or later, a high standard of educational qualification on the part of the candidates who may present themselves for examination. It is to be hoped, therefore, that every individual follower of our common calling will take a sufficiently wide, elevated, and dignified view of the present position of affairs as shall result in the material extension and increase of power of that Society into the hands of whose Council the choice of Examiners, and the general conduct of Pharmacy is now placed by Act of Parliament."

Mr. BRADY, Treasurer, presented the following Statement of Accounts:—

The Treasurer in Account with the British Pharmaceutical Conference, 1867-68.

Dr.	£	*s.*	*d.*
To Cash in hand, August, 1867	5	6	7
,, Sale of Proceedings	0	5	0
,, 334 Subscriptions, viz.			
7 for 1865-6			
41 for 1866-7			
243 for 1867-8			
41 for 1868-9			
1 for 1869-70			
1 for 1870-71 (Total 334) ...	83	10	0
	£89	1	7

Cr.				£	*s.*	*d.*
By General Printing—J. E. Taylor and Co.	£2	5	0			
,, General Printing—J. Bell	5	2	6			
				7	7	6
,, Cost of Proceedings—J. E. Taylor and Co.	£17	10	6			
,, Cost of Proceedings—W. West	3	18	0			
				21	8	6
,, Expenses connected with the Dundee Meeting				6	15	2
,, Stationery				1	0	2
,, Postage				13	4	4
,, Carriage of Parcels				1	5	2
,, Directing Circulars				2	4	2
,, Newspapers for Reports				0	1	0
,, Balance in hand				35	15	7
				£89	1	7

1868.			
August. Balance in hand	£35	15	7
Subscriptions due (340 in all)—			
4 for 1864-5, still unpaid	1	0	0
17 for 1865-6 ,, ...	4	5	0
109 for 1866-7 ,, ...	27	5	0
210 for 1867-8 ,, ...	52	10	0

Examined and found correct,
WILLIAM LAIRD,
G. B. MACKAY. } *Auditors.*

DUNDEE, *August 5th*, 1868.

Mr. W. SEARBY (Norwich) moved, and Mr. W. J. GARDINER (Norwich) seconded the adoption of the Report and Statement of Accounts, which were accepted unanimously.

The PRESIDENT then proceeded to deliver his

INAUGURAL ADDRESS.

Gentlemen,—In accordance with the arrangement made last year at Dundee, we have now assembled to hold at Norwich, as usual under the shadow of the British Association, the Fifth Anniversary Meeting of the British Pharmaceutical Conference.

Instituted at Newcastle on Tyne in the year 1863 and commencing its labours on a humble and unpretending scale, our Society has year by year increased in numbers, while the proceedings of its annual meetings regularly

held now for five years, have by no means retrograded in interest and importance.

While I thus congratulate you on the successful progress and present well-being of our Society as evidenced by our list of members now numbering over 550, as well as by the variety of interesting communications presented at our meetings, let me remark that we must not relax our efforts in promoting that spirit of study and research which so highly contribute to advance the dignity of the profession of pharmacy. The meetings of the British Pharmaceutical Conference are not indeed to be precisely measured by the importance of the papers brought before them :—they have another object besides the discussion of scientific subjects, namely that of binding together with a cord of union the pharmaceutists of this land, of providing an opportunity for discussing in various parts of the country subjects of common interest, and generally of promoting by personal communication that good understanding and mutual appreciation which so greatly contribute to render our course in life happy, harmonious and useful.

The advantages of associations such as ours have long been recognized on the Continent. In Germany, in France and in Switzerland, we find that year by year the pharmaceutists of some large district assemble by mutual accord for the purpose of discussing subjects bearing on the well-being of their profession. In the United States where the conditions under which pharmacy is practised resemble more closely those which prevail in our own country, there exists, as most of us well know, a flourishing association for the promotion of science in connection with pharmacy, as well as for the discussion of subjects bearing on pharmacy as a trade. This is the American Pharmaceutical Association, the fifteenth annual meeting of which was held in New York in the autumn of last year. Let us take a glimpse of the proceedings of our brethren on the other side of the Atlantic when assembled in the University Building, New York, on the 10, 11, 12 and 13 September, 1867. At the opening session, delegates appointed by the Colleges of Pharmacy of Massachusetts, of the City of New York, of Philadelphia, of Maryland, of Cincinnati, of Chicago, by the Pharmaceutical Associations of Maine and of the District of Columbia, and by the Alumni Association of the Philadelphia College of Pharmacy, presented their credentials, which after due examination were reported satisfactory. Then we find a resolution passed to this effect,—that " the Professors of the College of Pharmacy and of the Medical Colleges of this city, also the medical profession in general, be invited to seats in the present meeting." This has struck me as a particularly wise and liberal proceeding, showing that it is not narrow trade interests that the Association has assembled to discuss, but subjects which though of special interest to a small section of the community, really bear on the welfare of all, and which claim moreover the serious notice of those who are custodians of the public health.

A list of new members is next presented, and then follow reports of the Executive Committee, of the Committee on the Progress of Pharmacy, of that on the Drug Market, of those on Scientific Queries and on Internal Revenue Law, concluding with a report of the delegates to the International Pharmaceutical Congress, held in Paris in August last.

Various books and pamphlets were also laid before the meeting, the first mentioned being the Proceedings of the British Pharmaceutical Conference held at Nottingham. An inaugural address from the President, Mr. Stearns, was in his absence through ill-health, read by Professor Parrish. The Reports presented at a previous sitting were next taken up, and necessarily occupied a considerable time. That on Scientific Queries brought forward the various papers on scientific subjects which had been presented to the Association, among which I may mention the following :—

A paper on the use of Benzoin in Ointments, by Mr. Doliber.

On the Tartrates of Potash and Tartaric Acid from American Tartar, on Quicksilver in North Carolina, and on *Mata*, a leaf used by Mexicans to flavour Tobacco, on American Opium, the analysis of which showed it to contain over 10 per cent. of morphia, all by Mr. E. S. Wayne, of Cincinnati.

On the inner coat of the gizzard of the South American Ostrich, as a remedy for dyspepsia. (I hope *we* shall not be called upon to provide this new medicine.)

Mr. Wm. Saunders of London, Canada West, contributed a paper on the relative value of the rhizoma and rootlets of *Podophyllum peltatum*, proving that the rootlets afford most resin.

This will suffice to show you the useful and practical character of the work done by our transatlantic brethren; and now, Gentlemen, let us take a brief review of some of the contributions to pharmaceutical knowledge made in our country since we last met.

The detection and exact recognition of the vegetable alkaloids is one of the most important and delicate operations that it can fall to the lot of the chemist to attempt, and any addition to the tests already in use merits attention. Dr. Guy may therefore well deserve our thanks for the exactitude and unwearied patience with which he has performed an immense number of experiments on the sublimation of the alkaloids, a process first brought to the attention of chemists in 1864, by Dr. Helwig of Mayence. Dr. Guy has arrived at the conclusion that the method of subliming substances in minute quantities on flat surfaces of glass, in order to their complete examination by the microscope, a method first recommended for arsenious acid and corrosive sublimate, may be advantageously extended to the alkaloids and analogous active principles,—that characteristic results are readily afforded with very minute quantities, such as a thousandth of a grain of strychnine or even less,—that the results obtained by sublimation in the case of the alkaloids and analogous active principles are not more subject to failure than those of other tests,—in fact that several of the reactions are remarkable for delicacy, constancy and characteristic appearances.

Closely connected with this subject is the question of the temperature which must be reached in order that any particular alkaloid may assume a gaseous form,—or in other words, that it may sublime. Dr. Guy impressed with the unsatisfactory statements made in toxicological works and the somewhat rough modes of procedure adopted in order to test the volatility of such bodies, has applied himself to devise a more exact method, to the results of which communicated in the *Pharmaceutical Journal* of February last, I must refer you.

Another excellent observer who has also applied himself to this department of chemistry is Mr. H. J. Waddington, whose paper on micro-sublimation elicited when read some interesting remarks from Dr. Guy, Dr. Attfield and others. In common with Dr. Guy, Mr. Waddington had experienced the defects of the common method of subliming in a glass tube over a naked flame substances so easily decomposed as vegetable alkaloids, a method which has given rise to such statements as that a body is *partly sublimed and partly decomposed*, which seem to imply that the substance exposed to heat is not homogeneous, but that one part of it is volatile without decomposition, while the other is not. But no substance, as Mr. Waddington remarked, can sublime and decompose at the same temperature: partial sublimation and partial decomposition must be owing to a mechanical defect in the arrangement for heating the substance. That the subliming and decomposing points of many substances approximate very closely is most probable, for when the heat has been most carefully applied, it has often happened that a sublimate has been

contaminated with coloured matter which could only have arisen from decomposition. Dr. Attfield argued that it was almost as impossible to limit the subliming-point of a solid as the evaporating-point of a liquid, and instanced iodine, camphor, naphthaline, mercury and ice as solids, volatile at all temperatures. But are strychnia and morphia analogous with these, and is there any evidence that these latter are at all volatile except at an elevated temperature?

But I must pass from this interesting subject, only noticing that we have further to thank Mr. Waddington for remarks on the preparation of microscopic crystals, a communication of great interest to any one desirous of pursuing the subject, the practical value of which has been illustrated by our colleagues Messrs. Stoddart, Deane and Brady.

The analysis of potable water, more especially with a view to the determination of the organic matter it contains, continues to attract the attention of chemists both in England and on the Continent, and the various methods proposed for arriving at results more accurate than those hitherto attained have been vigorously discussed. Dr. Frankland's paper on water analysis in the *Pharmaceutical Journal* for February last, gives some idea of the elaborate pains required for arriving at satisfactory results.

And let me here notice the extremely interesting account of a medicinal spring in Jamaica given by our friend and colleague Dr. Attfield. The water of this spring is remarkable not only for the excessive amount of saline matter it contains, but likewise from this saline matter consisting exclusively of the chlorides of calcium, sodium and ammonium, the first named being in the proportion of 1510 grains in the imperial gallon. Assuming the flow of the spring to be as stated, about 70 gallons per hour (certainly no vast quantity) the amount of chloride of calcium outpoured in the course of 24 hours would be equivalent to 363 pounds. No other example is known of water so rich in this mineral constituent.

Apropos to this subject I must draw your attention for a moment to the volume on the table,—an essay on water, in which that ancient element is scrutinized and considered in every possible way. This fine work, a quarto of 400 pages, emanates from a Brazilian, a member by examination of the Pharmaceutical Society of Great Britain, Senhor Antonio Alves Ferreira, of Rio de Janeiro.

Experiments on the therapeutic action of drugs to be of real value must be carried on with so many precautions, so much patience, and a considerate attention to so many collateral circumstances, that practitioners of medicine as well as pharmaceutists may well be indebted for information such as that communicated by Dr. John Harley in his Lectures on the action and uses of Conium, Belladonna and Hyoscyamus. Dr. Harley's experiments on Conium seem to me a model of careful therapeutic research. The results are of much interest, proving conclusively that the drug is an active medicinal agent, but one of which the pharmaceutical preparations have been so defective and uncertain that the efficacy of the medicine had come to be regarded as very questionable. The dried leaf of hemlock was found by Dr. Harley to be of little if any value; the tincture whether made from leaf or fruit, to be inert (except from its alcohol); and the extract to be so weak n conia that it required to be given in doses of 30 to 40 grains to produce the least effect. The only preparation which retains the active principle of the drug in sufficient quantity, is the *preserved juice*, which given in the dose of from 2 to 8 drachms, is a safe and valuable medicine. As to Belladonna, Dr. Harley considers that its medicinal powers are wholly resident n atropine, a substance which I as a druggist may remark, is far more satisactory to handle than a liquid like conia or a highly deliquescent solid such

as hyoscyamine. Dr. Harley finds that its activity is destroyed by fixed caustic alkalies,—an observation previously made, as you will remember, by Dr. Garrod, who also pointed out the impropriety of combining Hyoscyamus with a caustic alkaline solution such as *Liquor potassæ*. The action of an alkali on atropine is not instantaneous, in fact the power of the atropine is not apparently diminished when freshly mixed. If as is probable the same observation holds good for hyoscyamus, it allows of that drug being administered with potash provided the two are mixed at the moment of taking the dose,—or perhaps it would be still better to give them separately.

The analysis of Jalap was the subject of a communication made at our last meeting, and it is one which seems still deserving attention. Messrs. T. and H. Smith assert, that in many trials they have never obtained of the resin more than 15 per cent., while our colleague Mr. Umney has recently obtained 21·5 per cent. from the Vera Cruz drug. Dr. Squibb considers that powdered Jalap which does not yield over 12 per cent. of dry resin should be rejected as unfit for use, an opinion I cannot indorse, for I have found Vera Cruz Jalap of undoubted goodness which yielded but 11 per cent., and a similar result was obtained by my friend Mr. Broughton.

The transition from Jalap to Rhubarb is natural, at least in the popular mind, and I notice this latter drug, in order to remind you of the interesting account of the cultivation of rhubarb in England, recently published by Mr. Usher in the *Journal of the Society of Arts*. Although the directions of the Pharmacopœia preclude the employment in an English pharmacy, of any other rhubarb than that of China (and most of us are practically unacquainted with any other), yet no such limitation extends to other countries; and that British Rhubarb is appreciated *somewhere* is proved by the fact alleged by Mr. Usher, that the demand is greater than the supply. The disappearance from commerce of the old-fashioned Russian Rhubarb, a drug that was of uniform excellence, has been followed by a remarkable alteration in the rhubarb shipped from China. For the last two or three years this rhubarb has been singularly bad in quality, whole chests affording only a few pounds of the drug in a sound condition. As the price has also very much advanced, it is not surprising that British Rhubarb which is at least well prepared and of good appearance, should find numerous purchasers. The increased facilities for traversing the interior provinces of China may soon I hope afford an opportunity of reaching some of the districts in which rhubarb is produced, and of bringing thence living plants of this most valuable drug.

Dr. Flückiger of Bern, one of the most careful and profound pharmacologists living, and who I am happy to tell you is a contributor of some papers to our Conference, has lately pointed out that a second sort of Kamala, differing essentially from that derived from *Rottlera tinctoria*, Roxb., has been imported into commerce. This new form of the drug appears as a dark chocolate-coloured powder which is seen to consist of grains of larger size than those of ordinary kamala and of very different structure. The new drug is remarkably free from sand, which has not been the case with most of that hitherto found in the market. Yet freedom from earthy admixture is a condition in which it is possible to obtain this drug, even as a commercial article. Some quantity of it recently shipped from India was so entirely pure that it afforded upon incineration only 1·37 per cent. of ash.

The introduction of the Cinchona into India is an enterprise the success of which ought to be gratifying to every Englishman, not indeed, so much as a source of commercial wealth to our country, as because it will, we may hope, perpetuate to the world a supply of those precious barks which the improvidence of the South Americans has long threatened to annihilate. To the Dutch we must concede the honour of having led the way to the good results

which our plantations promise to afford; for although the culture of the Cinchona was thought of and even feebly attempted so far back as the year 1852, it was not until after extensive plantations were commenced in Java in 1854, that our Government was stimulated to take the matter actively in hand;—and it is to the experiments, the failures, the errors of these first Dutch cultivators that we are indebted for much of the success already attained.

The chief plantations in British India, let me remind you, are those on the Neilgherry Hills, near Madras, the most elevated mountain range in India southward of the Himalaya. "The climates of the Neilgherry Hills," observes Markham, "are the most delightful in the world, and it may be said of this salubrious region, with its equable seasons, what the Persian poet said of Kung, 'the warmth is not heat, and the coolness is not cold.'"

By a parliamentary return it appears that in May, 1866, the number of Cinchona plants in the Government plantations in this locality was 1,233,645, of which nearly 300,000 belonged to the species yielding Red Bark, 758,000 to that affording Pale or Crown Bark, and 37,000 to *Cinchona Calisaya*. This, it must be remembered, by no means indicated the full extent of Cinchona culture on the Neilgherries, since there were in addition considerable plantations belonging to private individuals. From Mr. Broughton's report published in April of last year, which is the latest information to which I have access, it appears that the number of plants of the Red Bark in the Government plantations in that locality was at that date 800,000, which is an enormous advance on the Return from which I have just quoted. Other plantations have been formed in Wynaad, Coorg, on the Pulney Hills, and in Travancore, in British Sikkim, in the Kangra Valley in the Punjab, and at Mahabaleshwur in the Bombay Presidency. In Ceylon the success that has attended the introduction of the Cinchona has been most marked. "Many thousands of plants" writes Mr. Thwaites "have been distributed from the Hakgalla Garden, and I have received most favourable reports of their perfect health and vigorous growth; and not a single report of an opposite character has yet reached me: so that there appears to be every prospect of Quinine becoming before very long, one of the most important products of the island."

From the Himalaya the reports are no less remarkable. At Darjeeling, which, as you will remember, is one of the health-stations for the Europeans of Calcutta, there are now five plantations for the cultivation of Cinchona with an aggregate total in April last of more than 1,558,000 young trees, of which a large proportion belong to the species which furnish what are called Crown Bark and Red Bark.

But however rapid and vigorous the growth of the Cinchona in India, the culture of the tree would avail but little unless the bark were as rich in alkaloids as that produced in South America.

In fact at the outset of the enterprise many persons capable of judging had considerable misgivings as to the results. If the young plants could be induced to grow, would it not be needful to wait a generation at least before they would produce bark that it would be worth while to remove? should we not destroy the trees by the operation? And if we at last got the bark, might not it prove deficient in those constituents which render that of South America so valuable?

These surmises have happily not been verified:—in fact from the numerous analyses of Mr. Howard, Dr. De Vry, and Mr. Broughton, it is evident that the percentage of alkaloids in the bark grown in India may exceed that obtainable from the same sort of bark grown in its native country. Another point well worthy of notice is that the proportion which one alkaloid bears to

another varies extraordinarily in the same species,—sometimes quinine predominating, sometimes the less valuable cinchonine or cinchonidine. We are as yet to a great extent ignorant of the causes of this variation; but that they may be discovered and controlled seems to be the conviction of those most competent to form an opinion, for we find Mr. Howard speaks of a plant being "*encouraged*" to produce quinine instead of cinchonidine. In fact the process of coating the stems with moss after the removal of the bark as first practised by that most skilful of cultivators Mr. McIvor, is found not only to favour the rapid re-production of the bark, but even to increase its richness in alkaloids; and it seems we may hope to go a step further and to settle what those alkaloids shall be.

The success that has attended Cinchona culture has naturally led to the enquiry whether there are not other medicinal plants that may be introduced into our Colonies with equal hope of good results? Though we can certainly point to none at all comparable in importance to that which affords quinine, there yet are a few the cultivation of which is being attempted on an experimental scale. Of these, the most important seems to me to be Ipecacuanha, plants of which are now growing at Calcutta and Madras, as well as in the West Indian island of Trinidad; but in none of these localities does the plant prosper vigorously. In fact the experiment looks as little hopeful as the Cinchona enterprise did when the first Bark-trees were sent to India by Dr. Royle; and until we get a supply of good seeds from Brazil, I do not anticipate that it will be possible to make a fair trial of propagating the Ipecacuanha plant in India or elsewhere.

The experiments made in cultivating the Jalap plant (*Exogonium Purga* Benth.) are much more hopeful, and I have the gratification of presenting to your notice the first specimen of that drug produced in India. It was grown at Ootacamund where live roots carried from England by my friend Mr. Broughton were planted in January, 1867. These roots grew with surprising luxuriance, each producing a fine cluster of tubers: some of them were dug up in December of the same year, when the largest tuber was found to weigh over a pound and a half. This Jalap of India, you will observe, differs very notably in appearance from that we get from Mexico, owing chiefly to a different mode of drying:—in fact to facilitate this operation, the tubers have been sliced. It compares however, favourably with that of Mexico as regards percentage of resin, and from a few trials made in India, we may judge that its medicinal powers are fully maintained.

Let me now draw your attention to a fine specimen of Calumba Root, the produce of plants cultivated in Mauritius. It is, as you will readily perceive, remarkable for its fresh and brilliant colour and, were it in the market, it would, I think, command a far better price than the somewhat dingy drug that has lately reached us through the ordinary channels of commerce.

Here are some pieces of Calumba Root in a living state recently brought from Trinidad by my friend Mr. Prestoe, Superintendent of the Botanical Garden in that island:—Remark the brilliant yellow hue of the freshly cut root.

The Calumba plant seems to be of easy culture, and no reason appears why it should not be cultivated for the sake of its medicinal root in any country possessing a hot climate and a moist, rich soil.

But though I am thus advocating the culture of certain medicinal plants, there is a vastly larger number, the culture of which with a view to profit, it would, I firmly believe, be a delusion to attempt. Drugs already cheap, abundant, good,—drugs in small demand,—drugs which are comparatively unessential, or well represented by others,—those that are only procurable from plants or trees which arrive but slowly at maturity,—those, which (like Sarsaparilla)

are only found in regions uninhabitable to civilized man,—these, I say, we can afford to let remain products of the forest, some of them to disappear before the axe of the colonist, a few to hold their places in the interstices of cultivation, as the companions of more important and useful plants.

And now Gentlemen let me conclude, for I cannot but remember that there are gentlemen present who have to bring forward the results of their original experiments while I have been entertaining you with only a narration of the labours of others. One duty however remains and that is the pleasing one, of tendering my cordial thanks, thanks in which all my fellow visitors will join, to our Norwich friends for the excellent arrangements they have made for our meeting, and for the kindliness and hospitality with which they have received us.

Mr. G. Cubitt (Norwich) moved, and Mr. O. Corder (Norwich) seconded a vote of thanks to the President for his able and interesting address ; a proposition that was carried by acclamation.

Mr. Deane expressed his gratification at the admirable *résumé* of pharmaceutical progress brought forward by the President, whose qualifications for such a task were unrivalled, and he hoped that a similar abstract might be continued in future years.

THE PHARMACY ACT.

Mr. Reynolds, after alluding to the pleasant circumstances under which the Conference this year met, owing to the complete success which had attended their efforts in the way of legislation, moved the following resolution :—

"That the cordial thanks of this Conference and the whole profession, are due and hereby tendered to the President of the Pharmaceutical Society, and those who have laboured with him, for those exertions in the cause of pharmaceutical education which have resulted in the Pharmacy Act of 1868."

This success in legislation had not been of spontaneous growth. Every portion of it had been won for them by gentlemen who had given the subject most anxious attention, and who for many months must have left their own concerns, to great personal detriment, rather than allow the important matter they had taken in hand to fail by any possibility. Mr. Reynolds then mentioned different gentlemen whose exertions had assisted in bringing about this fortunate result.

Mr. Searby, who seconded the resolution, thought the public ought to be equally grateful to the President of the Pharmaceutical Society, for it was more in the interests of the public than of the chemists that the Act had been passed.

The resolution was passed *nem. dis.*

Mr. J. D. Smith (Norwich) had much pleasure in moving the following resolution, which bore upon the one that had just been passed :—

"That it is desirable there should be some public recognition of the services rendered to the cause of pharmaceutical education, and the improvement of the status of the profession, by Mr. George Webb Sandford, President of the Pharmaceutical Society, to whose careful and constant devotion the passing of the Pharmacy Act of 1868 is in great measure due."

Though his personal acquaintance with Mr. Sandford was very slight, yet it was sufficient for him to feel great respect, regard, and esteem for that gentleman. On one occasion he had to appear before the Pharmaceutical Society in reference to this Act, and he could easily understand why Mr. Sandford should be selected year by year to fill the high office of President.

His genial and warm-hearted manner, and his gentlemanly bearing and courtesy, marked him as a man who took the lead of his fellows. All societies were indebted for their existence to a few minds; and were it not for the attention and assiduity those men devoted to the express object to which they gave their attention, this and like associations would not prosper and flourish.

Mr. CALEY (Norwich) seconded the resolution, which was unanimously agreed to.

On the motion of Mr. T. B. GROVES, seconded by Mr. R. C. PITTS (Norwich), the following resolution was unanimously adopted :—

"That the President of the Conference be requested to address the Council of the Pharmaceutical Society, requesting the use of the Society's house for the purpose of holding a meeting on Tuesday, the 6th of October next, with a view to the carrying out of the foregoing resolutions."

Mr. SAVAGE referred to the great exertions in favour of the Pharmacy Act that had been made by the Parliamentary Committee of the Pharmaceutical Society. He could not but admit that some portions of the regulations, as to the sale of poisons, appeared objectionable, and even impracticable, but these had been introduced, not by the original promoters of the measure, but in spite of them.

Mr. DEANE thought that the poison clauses of the Act would be found less difficult to work than some of his brethren supposed; for his own part, he did not anticipate any serious inconvenience.

At the request of the President, Mr. CARTEIGHE proceeded to consider the effects of the various clauses of the Pharmacy Act, 1868, which were taken *seriatim*. Mr. Carteighe stated that he was acting unofficially in the matter, and that his rendering of any doubtful clauses must only be taken as the expression of his personal opinion.

Mr. BREMRIDGE, Secretary of the Pharmaceutical Society and Registrar under the Act, added valuable opinions upon the clauses as they were considered.

Passing over the preamble, which, Mr. Carteighe said, required no explanation, he remarked that Clause 1 provided that persons selling or compounding poisons, or assuming the title of chemist and druggist, must in future be qualified; that was to say, that from and after July 31st of the present year, no person should assume the title of chemist and druggist, or chemist or druggist, or pharmacist or dispensing chemist, or any designation which gave an impression to the public that he was duly qualified within the meaning of the Act, unless he had passed an examination, or was a pharmaceutical or non-pharmaceutical chemist in business prior to the passing of the Act.

Mr. SEARBY inquired whether shopkeepers in the country would be able to register under the Act.

Mr. CARTEIGHE replied, that in that case it would be important to refer to the schedules, where it would be found that a person in business before the passing of the Act would have to make a declaration in the form of Schedule (C), to the effect that he had been acting "as a chemist and druggist, in the keeping of open shop for the compounding of the prescriptions of duly qualified medical practitioners before" such-and-such a date. Accompanying that declaration must be sent another signed by a magistrate or medical practitioner, as attesting its truth. The object of that was that a person who merely sold drugs should not be registered under the Act; he must first get a magistrate or medical man to sign a certificate to the effect that to his knowledge such seller had been engaged in the compounding of prescriptions of duly qualified medical men. Of course there would be little instances of sailing close to the wind, which could not be easily avoided.

Mr. SMITH supposed that persons not being registered could not sell the articles mentioned.

Mr. CARTEIGHE said they could not then assume the title of chemist or druggist, and collaterally, they could not sell any of the poisons mentioned in the schedules.

Mr. SEARBY asked whether the Pharmaceutical Society would take any steps to register persons; otherwise half the shopkeepers who had pestles and mortars would be registered as chemists and druggists.

Mr. CARTEIGHE replied that one clause in the Act defined the duty of the Registrar, who was under a severe penalty; in fact he was even liable to six months' imprisonment if he neglected his duty. It would be his duty to see that the schedules were properly filled up, that the certificates were signed by the authorities named, and that they were duly qualified medical practitioners or magistrates. If a shopkeeper who had signed a certificate was found not to have been engaged in compounding prescriptions of duly qualified medical practitioners, it would be a penal offence. The second clause provided that the articles mentioned in Schedule A should be assumed to be poisonous. Many poisons of considerable virulence were, however, omitted, but it would be within the power of the Council of the Pharmaceutical Society, with the accordance of the Privy Council, to order any other article which in a concentrated form would be poisonous to be added to the list, notice thereof to be given in the 'London Gazette.' Chemists and druggists were defined in Clause 3, to be persons who had carried on that business "in the keeping of open shop for the compounding of the prescriptions of duly qualified medical practitioners," also of all assistants and associates who, before the passing of the Act, should have been duly registered under or according to the provisions of the Pharmacy Act. After remarking that a duly qualified medical practitioner was one registered under the Medical Act, and that the majority of the Coffinites would be excluded, Mr. Carteighe, in reply to Mr. Lenton, said if a man who had settled in a village managed to get registered, and it should be found that he was not in the habit of compounding prescriptions, then he was liable to a penalty; and if it could be shown that his certificate was signed by a doctor, as suggested, knowing it to be incorrect, then that doctor would be liable to a penalty too.

Mr. LENTON, East Dereham, thought that in the eye of the law such a man would be as well qualified as the best-educated man amongst them.

Mr. CARTEIGHE said not in dispensing; he must not only be a chemist and druggist, but a compounder of prescriptions. Clause 4 related to assistants and apprentices. Any person of full age at the time of the passing of the Act, who should produce to the registrar a certificate that he had been for three years actually employed in dispensing prescriptions, should, on the passing of such modified examination as the Council of the Pharmaceutical Society, with the consent of the Privy Council, might declare to be sufficient evidence of his skill, be registered as a chemist and druggist under the Act. That clause was intended to apply to all brought up to the business in an orthodox manner. It seemed to be understood that assistants would have to go to London to be examined before the end of the year. Such was not the case. They must sign a schedule showing they were assistants, and their masters must sign a similar certificated schedule, showing that they had been assistants, and then the application when made to the Registrar would be filed, and the assistant examined at any time convenient to himself, but before he went into business.

Mr. SCHACHT was in favour of the examinations being local and simultaneous, as it would put the assistants in the country at an unnecessary disadvantage to go at any time up to London to pass the examination. He was

anxious to promote the earliest possible reception of all assistants within the terms of the Act, that we could the sooner assure the public that we employed legally qualified assistants only. Since the Legislature had refused to the class of assistants the very easy means of entrance which it proffered to all employers, he trusted that the examinations for assistants would be made as lenient as was consistent with their object.

Mr. ABRAHAM had brought the question of simultaneous local examination before the Council of the Pharmaceutical Society at a recent meeting, but had not succeeded in convincing that body of their necessity or advantage. It was right that assistants, who were disposed to complain of any hardship shown towards their class by the Act, should remember that they were the persons who might be expected to reap eventually the greatest benefit from the Act. If it were successful, either with respect to themselves or to the public, it was the younger members of the profession who might be expected to witness that result. The practical operation of the Act would have been very remote, if assistants and apprentices had been entirely exempted from its operation; and he had not found that they were disposed to complain.

Mr. CARTEIGHE said that the Council did not consider that the *vivâ voce* and practical examination which it proposed could be carried into effect excepting in London, and he believed that assistants would prefer this to any examination by written papers.

Mr. EVANS said that the scheme of the modified examination was determined on by the Council of the Pharmaceutical Society, but awaited confirmation by Her Majesty's Privy Council. It was of a thoroughly practical character, and did not demand much theoretical knowledge. No assistant unable to pass it could be fit for the responsibilities of his daily duties.

Mr. REYNOLDS could not agree that simultaneous local examinations were impracticable, because practical questions were required to be embraced. The Universities and the Department of Science and Art were able to take perfectly equitable simultaneous examinations in Practical Chemistry, at various provincial centres, in addition to their written examinations. Mr. Radley, of Sheffield, and other chemists, had expressed to him strong opinions on this point. Some years since, the Pharmaceutical Society took what was intended as a first step in this direction by an alteration then made in the Board of Examiners. The matter deserved further consideration.

The subject was then adjourned to a future sitting.

After a short interval, business was resumed at 2 P.M., by the reading of papers.

ON HONEY, ITS FORMATION AND CHANGES.

BY W. W. STODDART, F.G.S.

Honey and wax, the produce of the well-known insect (*Apis mellifica*), have been household words with the apothecary from time immemorial. That they are of importance to the modern pharmaceutist is evident from their being essential ingredients in no less than twenty-six preparations of our Pharmacopœia, to say nothing of the "thousand and one" uses in domestic life. The consumption in England is something enormous; besides what is gathered in this country, more than 450 tons are annually imported. It, then, becomes of some importance to the dispenser that he has a good and pure article, which I am sorry to say is not always the case. It is bad enough that a dishonest tradesman can find a cheap and adulterated stock ready at hand, but it is far worse when an honest tradesman has to keep all his wits about him to prevent the unconscious reception of a spurious substance.

For several years past the author has paid attention to the natural history and chemistry of honey, and has already published a few observations. As little is known on the subject, a continuance and confirmation of them will perhaps be thought worth recording.

On turning over the works on honey, you will find that not only do the authors contradict each other, but even sometimes themselves. Fownes, Turner, Gregory, and others state "that the solid part of honey is grape sugar," but tell us nothing of the liquid. Johnstone, in his 'Chemistry of Common Life,' says, "Both the solid and liquid portions have *the same general properties*, and that both are equally sweet." Dr. Hassall, in his work on 'Food and its Adulterations,' says "that the solid part of honey, when examined, shows myriads of regularly-formed crystals, *identical in form with cane sugar*." This probably is a misprint. The best account, though a brief one, is that in Dr. Attfield's 'Pharmaceutical Chemistry.'

The author's experiments serve to show that there are three principal sugars in the honey of the shops, varying their proportion according to age; and, as will be noticed further on, that all these are derived from the decomposition of cane-sugar, or sucrose ($C_{12}H_{22}O_{11}$).

Sucrose, when pure, forms very fine, large, oblique, rhombic prisms, and crystallizes in masses, as well seen in sugar-candy. When the crystals are small, as for microscopic observation, they generally crystallize on their sides, when they appear as if the ends were truncated, and the edges at right angles to each other. This is simply owing to their position. A solution of sucrose always

Fig. 1.—English Honey. Magnified 265 diam.

turns a ray of polarized light from left to right, and is therefore commonly called right-handed sugar. When acted upon by nitrogenous matter, as that in fresh honey, this crystallizable sucrose becomes partly changed into uncrystallizable sugar, or inverted sugar, because it turns a polarized ray of light from right to left.

Freshly gathered honey contains both of these, mixed with a third kind of

sugar, especially when kept for a few weeks, viz. glucose ($C_{12}H_{24}O_{12}$) or grape-sugar.

Glucose is a crystalline substance, possessing about one-fourth the sweetening power of sucrose. It crystallizes in small tufts of thin prisms, pointed at both ends. The crystals, when formed for the microscope, always have *pointed* ends, instead of the *square* ones before mentioned, and owe this peculiarity simply to position also. This property is of great assistance to the micro-chemist when examining saccharine substances.

We will now pass on to the formation of honey as found in a newly-made comb. On examining the disk of many flowers, a number of glandular or scale-like bodies may be seen, abounding in a sweet liquid when the flower is at its height of beauty. Many plants, as the *Ranunculus* and *Fritillaria*, have a small glandular cavity at the base of the petals, filled with the same fluid, but not so plentifully as those on the disk. This fluid is commonly termed nectar, and therefore, in the older botanical works, the part of the flower supplying it was termed the nectary. This sweet fluid is a true sugar-syrup, eliminated from the amylaceous sap of the plant, and its office is probably to afford nourishment to the stamens and pistil. The so-called nectary serves the purpose of a reservoir for the superabundant fluid, and excites the instinct of the bees.

These singular insects choose many plants preferably to others, and, what is stranger still, a bee only attacks the same kind of flower in a garden at each visit, although surrounded by hundreds of others. This may be easily proved by examining a bee on its return to the hive, when the pollen will be seen to be all of one kind. The plants that have been noted as being the greatest favourites are—

Borago officinalis.	Echium vulgare.
Brassica campestris.	Thymus Serpyllum.
Colchicum autumnale.	Rubus Idæus.
Erica cinerea.	R. cæsius.
E. tetralix.	Rosa canina.
Cheiranthus Cheiri.	R. rubiginosa.
Althæa rosea.	R. arvensis.
Reseda lutea.	Sarothamnus scoparius.
Ribes Grossularia.	Melilotus officinalis.
Rosmarinus officinalis.	Cratægus Oxyacantha.
Tilia europæa.	Salix (various).
Corylus Avellana.	Polygonum.
Ribes nigrum.	Menyanthes trifoliata.
Ulex europæus.	Trifolium repens.
Lonicera Periclymenum.	T. pratense.

besides innumerable others.

The local flora has the greatest possible influence on the taste, colour, and other qualities of the honey of the neighbourhood. For instance, that from the sandy districts of Worcestershire and Salisbury Plain has a rich golden colour, while that from Wales and the suburbs of Bristol has a dark, dirty-brown colour and coarse taste.

On examining the sap of many immature flowers, it was found to give a distinctly bluish colour with iodine, showing the presence of starch. After the lapse of twenty-four hours, the sap was sweetish, and iodine now only gave a dirty greenish-brown colour. The highest degree of sweetness was just when the flower fully expanded.

The next step was to find out what the sweet matter was. The part of the petal or disk, according to the flower, was sliced, macerated for a short time in a little cold distilled water. The liquid was then heated with lime and carbonic acid, filtered, and evaporated *in vacuo* over sulphuric acid, on a glass slip.

Some of these results I have on the table before you. The crystals are from

Cheiranthus Cheiri, *Lonicera Periclymenum*, *Trifolium pratense*, and *Rosa canina* (Fig. 2). They are very difficult to separate, owing to the very rapid change into glucose by the chemical addition of a molecule of water. The angles are very decided, and measure 90° and 134·25°. They are very beautiful objects for the polarizing microscope, and are most decidedly pure sucrose.

The bee, then, led by instinct to the favourite plants, inserts its ligula into the corolla, and laps up the sacchiferous liquid, and passes it into the honey sac. The ligula is not, as was once supposed, a hollow tube, through which a liquid

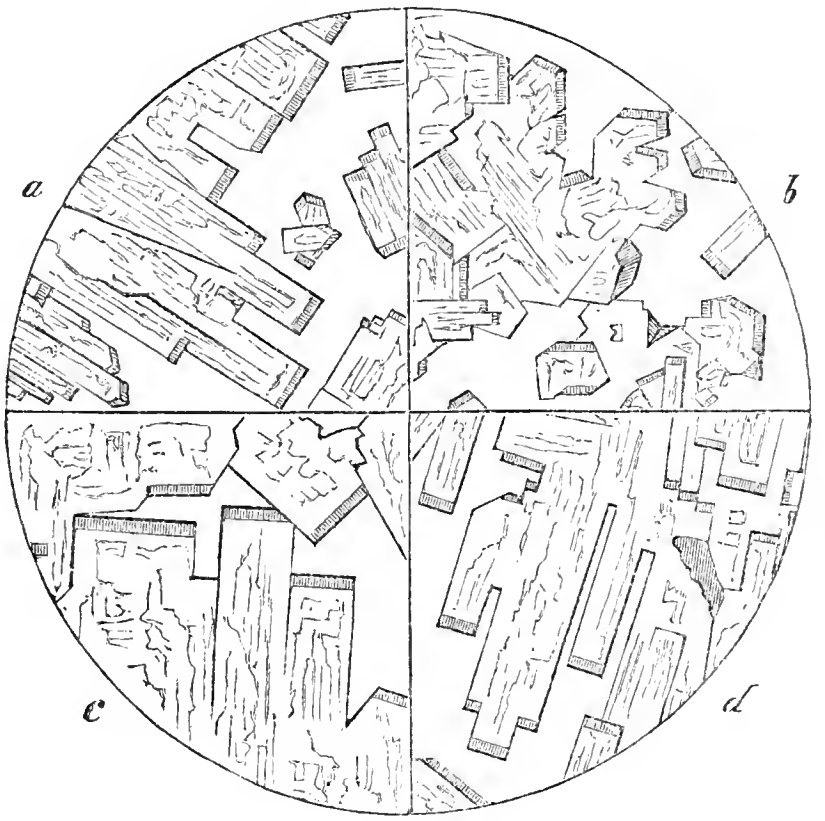

Fig. 2.—*a*, Sucrose from *Polygonum Fagopyrum*; *b*, *Cheiranthus Cheiri*; *c*, *Trifolium pratense*; *d*, *Erica cinerea*. Magnified 60 diam.

may be sucked, but is a solid, flexile organ, covered with circlets of hairs. Like the palate of a mollusk, it is simply retracted into the mouth, and wiped, as it were, by the fauces.

While retained in the honey-bag, it receives the addition of an acid which possesses all the reactions of formic acid. It is probably this that causes the peculiar tingling sensation in the throat that is frequently experienced when much honey is eaten. The formic acid may perhaps be the result of the decomposition of the sugar, thus—

$$\underset{\text{Cane sugar.}}{C_{12}H_{22}O_{11}} + 14\,O = 10\underset{\text{Formic acid.}}{(HCHO_2)} + 2\,CO_2 + H_2O.$$

On arriving at the hive, the bee deposits the contents of the honey-bag into the comb, where it remains till the stock is taken.

At this stage, honey is a clear, thick, yellowish liquid, having a sp. g. 1·423, and does not give a blue with tincture of iodine.

After collection, this honey gradually thickens, and deposits crystals, becoming rather opaque. A bit, placed under the microscope, will be seen to consist of a mass of regularly-formed crystals, as shown in Fig. 1, floating in a clear liquid, and interspersed with pollen-granules. These crystals are those of dextro-glucose; they are very thin and transparent, and the measurement of their

angles is 120°. They are evidently derived from the gradual decomposition of the sucrose.

This transformation proceeds from day to day till the honey is a solid mass of crystals, and is then said to "set." After a time, say twelve months after being gathered, so much is changed into masses of glucose crystals that it "candies."

The glucose itself begins to ferment and form other compounds. The examination of a little under the microscope now shows tufts here and there of acicular four-sided prisms, which are the hexatomic alcohol, mannite.

$$\underset{\text{Grape sugar.}}{C_{12}H_{24}O_{12}} + H_4 = 2\,(\underset{\text{Mannite.}}{C_6H_{14}O_6}).$$

Decomposition goes further still in very old or badly-kept honey; fermentation sets in, carbonic acid is given off, and alcohol, with acetic acid, will be distinctly perceived.

$$\underset{\text{Glucose.}}{C_{12}H_{24}O_{12}} = 4\,(\underset{\text{Alcohol.}}{C_2H_5HO}) + 4\,CO_2.$$

Then afterwards—

$$\underset{\text{Alcohol.}}{C_2H_5HO} + O_2 = \underset{\text{Acetic acid.}}{C_2H_4O_2} + H_2O.$$

The fluid part of old honey is lævulose, or left-handed glucose. It is uncrystallizable, and turns the polarized ray to the left instead of the right.

The pollen-grains may be easily separated for examination by dissolving a little honey in a few drops of distilled water put into a conical glass. They collect at the bottom, very little altered, and ready for transferring to the usual glass slip.

From all that has been said, therefore, honey is originally formed from a solution of cane-sugar (sucrose), which gradually changes into grape-sugar (glucose), and forming, as it proceeds, a small portion of mannite, formic acid, and alcohol.

The colour and flavour are both due to, and derived from, the aroma of the flowers which the bees have visited.

Such ought honey to be; but, alas! like other things, the adulterator has found it a good field for his exertion. I have often examined specimens adulgerated with pea- or bean-flour, turmeric, pipe-clay, brown sugar, treacle, gypsum, yellow ochre, fine sand, and water. (On the table were specimens of pipe-clay, yellow ochre, gypsum, and sand, that had been separated from honey bought in Bristol and London.)

Following are four analyses of samples that were actually bought and sold :—

No. 1.

Brown Sugar	15·85
Honey	84·15
	100·00

No. 2.

Pea- or bean-flour	18·7
Honey	68·8
Water	12·5
	100·0

No. 3.

Honey	94·9
Pipe-clay	4·7
Turmeric	·4
	100·0

No. 4.

Sulphate of lime	6·3
Sugar	12·5
Honey.	81·2
	100·0

Sugar is easily detected by the microscope, for not only are the crystals easily distinguished, but generally the sugar-itch insects occur in the field of vision in great number, and in all stages of growth (Fig. 3).

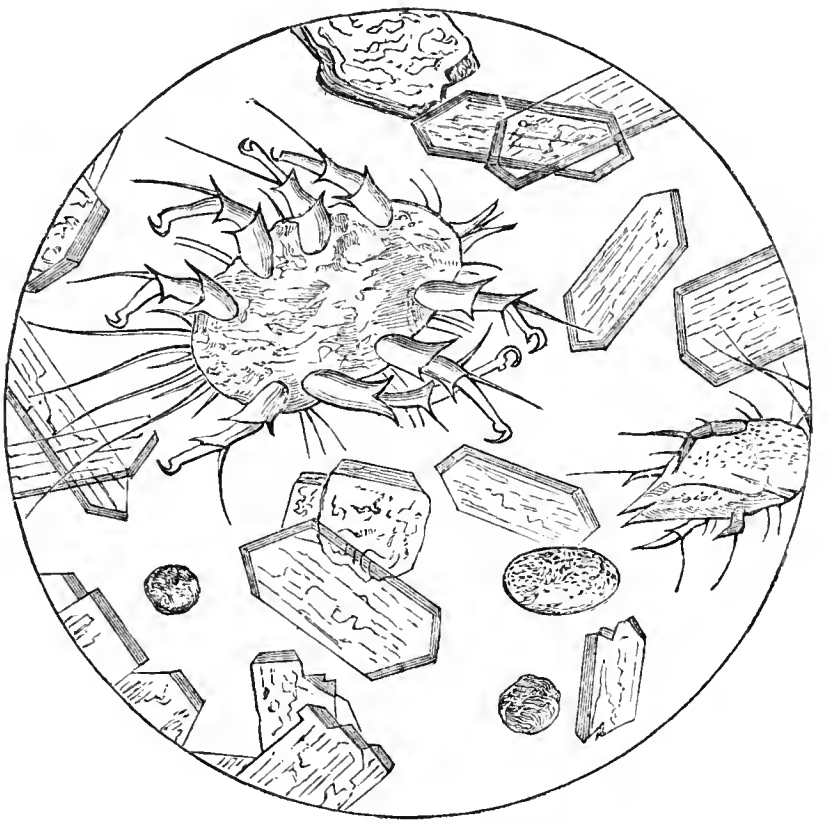

Fig. 3.—Honey Adulterated with Brown Sugar, showing Acari.
Magnificd 265 diam.

(Several specimens on the table were obtained by dissolving honey thus adulterated, and straining through fine cambric.)

I believe, however, that a great deal of honey is imported from the Continent that is largely adulterated with starch-sugar; this being so nearly identical with the true glucose of honey itself, the imposture is almost impossible to prove satisfactorily.

In reply to the President, Mr. STODDART explained the details of his method for getting deposits of sucrose from flowers for microscopic examination. He washes a number of flowers in a very small quantity of water, adds lime, removes this again by carbonic acid, obtaining a drop or two of a filtrate from the edge of a piece of blotting-paper, upon which the turbid liquid is placed.

The thanks of the Conference were voted to the author of this paper, and subsequently to the other essayists as their papers were read.

OBSERVATIONS AND EXPERIMENTS ON ROSE OIL.

BY DR. F. A. FLÜCKIGER, OF BERN.

The essential oil of roses is, in many respects, one of the most interesting

volatile oils, so far as we can judge from the few exact notions we have of its chemical properties. We will not allude in this place to its early history, which also ought to be more exactly elucidated. In a chemical point of view, attar of roses is a mixture of a liquid oil containing oxygen, to which is due the perfume of the attar, and of a solid hydrocarbon (stearoptene) entirely devoid of odour. This is the case with a great number of essential oils; their hydrocarbons, however, are mostly highly aromatic. Besides this, the analyses of Théodore de Saussure* and Blanchet† have long since revealed a very striking peculiarity of the solid part of the oil, that is, its being composed of carbon and hydrogen in equal atomic proportion.‡

The recent experiments of my friend Daniel Hanbury§ have shown that this stearoptene is also found in a comparatively large proportion in the roses of western and even northern Europe, and that it sometimes exceeds in weight the liquid portion.

The most recent paper on this subject, that of Dr. Baur of Constantinople, in the 'Neues Jahrbuch für Pharmacie,' January, 1867, translated, with valuable additions, by Mr. Hanbury,|| also affords some contributions to a knowledge of the stearoptene of rose-oil.

I have always regarded the properties and the composition of the rose stearoptene with some doubts, as they indeed differ from those of all analogous bodies hitherto known in essential oils. All the other camphors or stearoptenes of the properly so-called essential oils of the vegetable kingdom are composed of carbon, hydrogen, and *oxygen;* most of them are fusible only at a much more elevated temperature, and are possessed of the smell of the oil from which they are derived. And as to the hydrocarbons occurring in volatile oils, all are poorer in hydrogen, none being composed of an equal number of atoms of the two compounds.

These facts are certainly encouraging enough to induce one to submit rose-oil to a renewed examination, but the great difficulty is to procure an undoubtedly pure oil, that of commerce being always adulterated. The sophistication in most instances has nothing to do with the stearoptene, and does by no means alter it; yet, in order to examine it, I was under the obligation to set aside all possible objection referring to the purity of the oil.

To Mr. Hanbury I am indebted for samples of genuine rose-stearoptene, which have enabled me to make the following experiments. The stearoptene in question is the same which Mr. Hanbury has already described, and which was prepared by himself in London from Mitcham roses. I have nothing important to add to his statements concerning the physical properties of the stearoptene, which I simply confirm. I tried in vain to obtain perfect crystals of it. If it is cautiously melted in the sunlight, the microscopical crystals formed on cooling show a very peculiar shape. Most of them have the form of truncated hexahedral pyramids, not, however, belonging to the rhombohedric system, as the angles evidently are not equal. Many others are very peculiarly curved, nearly S-shaped. Examined under the polarizing microscope, these crystals make a brilliant object from their refractive power. In a pure state the melted stearoptene quickly and thoroughly crystallizes on cooling, so completely that the microscope can easily reveal the presence of most of the solid bodies which can possibly be fraudulently added to it. Neither spermaceti nor fatty acids resemble it in their crystallographic character, which, indeed, is very striking in the pure stearoptene. I scarcely need add that amorphous substances, like wax, may still more easily be detected by the microscope. But we

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* 'Annales de Chimie et de Physique,' xiii. (1820) 337.

† Annalen der Pharm., vii. (1833) 155.

§ Pharm. Journ. and Transact. xviii. (1859) 504.

‡ C=6, H=1.

|| Ibid. ix. (1867) 286.

are informed by Hanbury, as well as by Baur, that it is a liquid volatile oil which is chiefly used for the adulteration of attar.

I fully agree with these authors and others that the stearoptene does not possess the smell of roses. Not only is it devoid of that, but upon being heated it emits a *very offensive odour, exactly like that of heated fat or wax.* All observers attributing any rose odour to this stearoptene must have had it in an imperfectly purified state. If the stearoptene is repeatedly dissolved in chloroform, and precipitated by spirit of wine, and finally heated at 212° F. for some hours, it will be obtained entirely odourless at the ordinary temperature, smelling only when heated as above stated.

According to an analysis made lately by Mr. Stierlin, one of my pupils, the composition of rose-stearoptene agrees indeed with the formula $C_n H_n$. Mr. Stierlin found—Carbon . . . . . 84·96 per cent.

Hydrogen . . . . 14·54 ,,

Whether $C_{16} H_{16}$ as proposed by Blanchet, is the true formula or not, cannot yet be determined; it may as well agree with $C_n H_{n+2}$. This is of secondary importance for the moment, and requires many further researches.

I wished to know the density of the vapour of the stearoptene, but it does not support a sufficiently elevated temperature without decomposition. Its behaviour is exactly like that of wax; it does not sublime, but slowly ascends the walls of the vessel, and takes a brownish hue. At 90° to 91° F. (32·5° C.) it melts; at 276° F. (150° C.) vapours are evolved; at 496° F. (272° C.) it begins to boil; at 500° F. (275° C.) the whole mass is boiling, and turns brownish; at 546° F. (300° C.) blackish.

These facts are striking enough, considering that the stearoptene is obtained by submitting roses to the usual distillation, and show evidently the effects of the diffusion of vapours. In this respect I cannot agree with those observers who say that, on paper, the stains of rose-oil disappear quickly. This is not possible whenever the oil contains much stearoptene; and a paper on which I caused some pure stearoptene to melt did not lose the stain on exposure to the heat of the water-bath for some days. A mixture of bichromate of potassa and sulphuric acid does not manifestly react upon it, yet a light odour somewhat resembling acroleine appears to prove that some reaction must take place.

Potassium does not alter the melted stearoptene; when heated with dry caustic potassa a slight smell of mace is evolved; but benzol removes nearly all the stearoptene unaltered from the melted mass. If this is neutralized with sulphuric acid, no fact showing any action of the potassa on the stearoptene is observed.

These experiments prove that the behaviour of rose-stearoptene is well in accordance with its composition, and that it is a very stable body. Fuming nitric acid, even in large quantity, does not energetically attack it. But if this reaction is continued for some days, the fuming acid always being maintained at 212° F., the stearoptene gradually diminishes. The best way of promoting the oxidation is to place the two liquids in a large glass tube immersed vertically in boiling water, and to shake it frequently. The tube terminates in a sharply-pointed end, which I cover with cork. The latter retains the nitric vapours without any danger, as the cork is easily thrown off if their tension becomes too strong. The top of the tube may be a little curved downwards, in order to prevent the products of the reaction of the air upon the cork from being washed into the tube.

When after some days the stearoptene has entirely disappeared the liquid is perfectly clear while hot, but always becomes somewhat turbid on cooling, though without separating any oily drops. It is then heated to 212° F. in a small glass retort until all the nitric acid has distilled. In the liquid coming over, the smell of *butyric acid* cannot be mistaken, and several trials have

proved to me that this acid is a constant product of this oxidation. The liquid which passes over after having been saturated with caustic potash yields a white precipitate with nitrate of silver, which, on heating, turns brownish or blackish, probably from some *formic acid*. The salt of silver, being decomposed by sulphuretted hydrogen, yields a few large crystals of a third acid, the nature of which I have not been able yet to ascertain. It would be rather difficult to explain how it could happen that *fumaric acid*, for instance, passed over. The upper part of the retort itself showed inside numerous small acicular crystals, which were readily dissolved by water, and were recognized as *oxalic acid*, which, however, is not found in any considerable proportion, or probably is partly destroyed by long contact with nitric acid. In another essay I was not able to find any trace of it.

The contents of the retort at last were a thick colourless liquid smelling but very little of butyric acid; water quickly dissolved it, leaving only a few oily drops, which, on addition of a large quantity of water, almost entirely disappeared; they may perhaps have been *valerianic acid*.

The aqueous solution, after due concentration, yielded hard crystals, which on careful examination, showed all the reactions of *succinic acid*. Exactly neutralized with ammonia, their solution produced an abundant reddish-brown precipitate in a solution of perchloride of iron, a white one in neutral acetate of lead, which was dissolved by the acetate in excess. Chloride of calcium is not precipitated unless alcohol is added; the succinate of lime dissolves quickly in a solution of chloride of ammonium, but is again precipitated by a large volume of alcohol. I have no doubt that, with the opportunity of treating more considerable quantities of the stearoptene, several other acids of the series of the fatty acids, or others of the same class as those formed by the reaction of nitric acid on waxes and fats (suberic acid, pimelic acid, etc.) would be met with. *Succinic acid, however, is by far the chief product of the oxidation of rose-stearoptene;* yet from wax and fatty bodies it differs by its composition. Now, there is another hydrocarbon, or, rather, a whole series of hydrocarbons, commonly called *paraffin*, bearing a very close resemblance to the stearoptene under examination. By the researches of Hofstädter* we are informed that succinic, valerianic, and butyric acids are formed, when, if paraffin of different extraction is boiled with fuming nitric acid; of the first-named acid, 18 per cent. may be obtained. Neither potassium nor caustic potash act on paraffin. I have repeated Hofstädter's experiments, and have succeeded well in obtaining the acids in question. Paraffin is even much easier oxidized by nitric acid than rose-stearoptene, but the latter yields much more succinic acid. The fusing-point of the different paraffins is generally about 107° F. (42° C.) to 140° F. (60° C.); yet one sort from France (Autun), prepared and examined by Laurent,† melts at 26·4° F. (33° C.) exactly like our stearoptene of the rose.

The chemical position of the various bodies called paraffin, azokerit, etc. is not yet settled. We do not know whether their composition agrees better with the general formula C_nH_n, or with C_nH_{n+2}; probably they form a whole series of very analogous bodies, the separation of which has not yet been thoroughly realized. I hope to be entitled, in conclusion, to say that it is probable, when all these hydrocarbons are fully known, the stearoptene of roses will be found to belong to the paraffin series.

I have not, as yet, had the opportunity of procuring Turkish rose-oil of unquestionable purity, but there can be little doubt that its stearoptene is of the same nature as that of the English roses, the examination of which I have here detailed.

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* Annalen der Chemie und Pharm., 94 (1854), p. 333.

† 'Annales de Chimie et de Physique,' 54 (1833), p. 394.

A discussion, initiated by Mr. BRADY, followed the reading of this paper, Professor ATTFIELD and Mr. SUTTON joining with that gentleman in the wish to connect permanently with the Conference some of the pharmacologists of other countries who might show their interest in it, as Dr. Flückiger had done. The great merits of the paper were recognized by the speakers, who stated their desire that a class of foreign members could be instituted, to enable the Conference to express its sense of the honour done to it in such a case as this. The formal consideration of the subject was postponed.

SIPHON MEDICINE GLASSES.

BY BARNARD S. PROCTOR.

There are probably few pharmaceutical fathers who have not felt that the system of choking medicine into a child was a barbarous and sometimes even a dangerous mode of overcoming the infant's repugnance to physic, and that the old-fashioned, covered medicine spoons were instruments of torture, the use of which should be punishable as a cruelty to animals. Such have been my feelings, and in the bringing up of four children I have repeatedly endeavoured to devise some means of removing this disgrace upon the art of physic-taking. But I need not tell of my failures, but proceed at once to that which has been pronounced by mother, nurse and doctor to be worthy of general adoption.

The little fellow whose necessity was the mother of my present invention commenced life with an imperfect action of several of the viscera which more than once threatened his life, and rendered it necessary to have very frequent resort to the aid of medicine, but the convulsions and congested state of the lungs to which he was subject would at times make it a matter of some danger to give him either food or physic, for fear of a fit of choking putting a stop altogether to the process of respiration, which he already had a struggle to maintain. When at the worst, food and medicine alike had to be given by allowing him to suck them out of a cloth which had been dipped into them; the moisture being grateful to his parched mouth, no doubt made him willing to take whatever was given him in that way, and as he recovered the ability to take his food in the true infantile fashion, we gave him physic upon the same principle, trusting to the instinctive disposition to suck being sufficient to overcome his repugnance to the taste. The tube of a Gilbertson's feeding-bottle broken short and fitted into a cylindrical minim measure, was the form adopted for our first experiment, and it was with much satisfaction that we found whatever was given in this way was taken not only without difficulty but often with positive eagerness. Rhubarb mixture and castor-oil were alike acceptable if only offered when the stomach was empty. I have consequently had graduated glasses made of a suitable size and shape, and fitted with cork, tube, and teat, which it is scarcely necessary to describe more particularly. The following are the advantages of administration with this glass over the old plan of giving medicine with a cup and spoon.

1. The glass being accurately graduated, the dose may be measured with correctness and facility.

2. The medicine being in a deep vessel is not liable to be spilled.

3. The glass being corked, the child does not smell the medicine, the odour of which, if given in the old way, will often produce a feeling of disgust before a drop has entered the mouth.

4. The medicine being conveyed to the back of the mouth through the tube and teat, it is less tasted.

5. The tube descending to the bottom of the glass, any heavy materials are sucked up first, and made sure of, while by the old method they are apt to be left behind in the cup or spoon.

6 The act of sucking being instinctive, there is no choking nor sputtering, consequently no loss of medicine, nor uncertainty as to how much has been taken, and no soiling of the infant's or nurse's clothes.

7. A dose may be given to the infant while asleep, without its being roused, the application of the teat to its lips being generally sufficient to make it suck in its sleep.

It has been thought that adults should not be entirely excluded the benefits of anything which facilitates or felicitates the deglutition of drugs, for it is astonishing how many a man will behave himself like a baby when he has a dose of Gregory under his nose; nor yet is it to the weak-willed specimens of their species only that the adult's siphon medicine glass will commend itself. It is simply an acid tube fitted to a graduated glass of a deeper pattern than usual, and may be used with convenience and advantage wherever an acid tube is required.

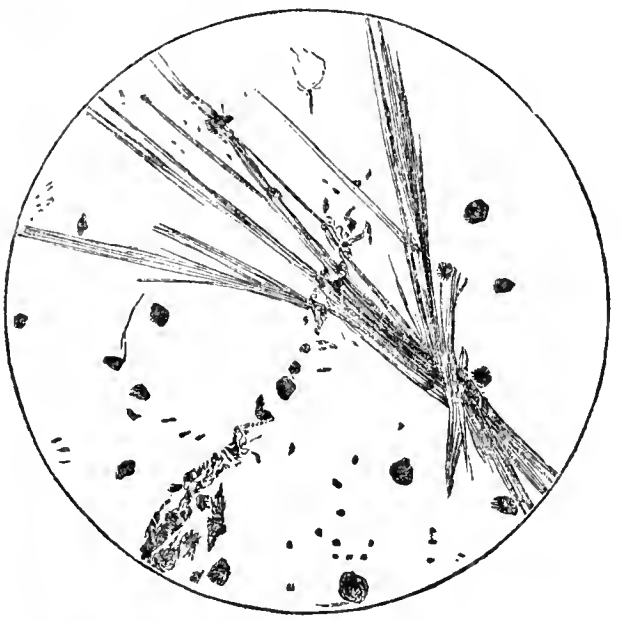
The humorous style of this paper excited much amusement.

A FEW RESULTS OF A MICROSCOPICAL AND MICRO-CHEMICAL EXAMINATION OF THE ALKALOIDS.—(First Paper.)

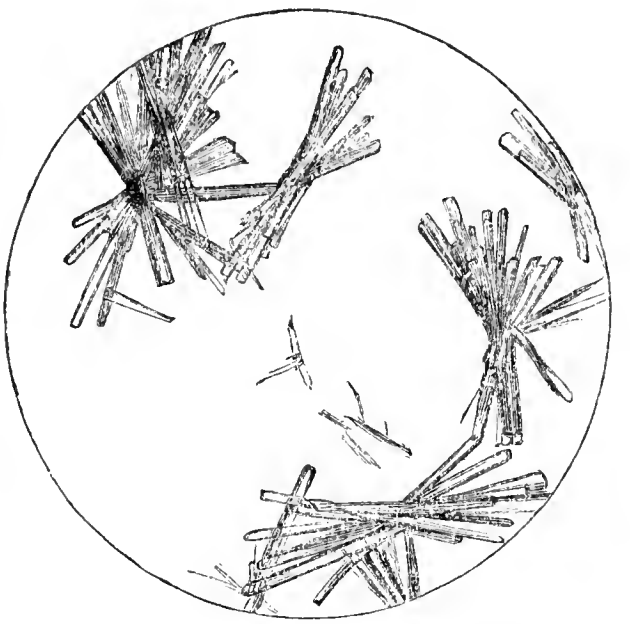
BY M. J. ELLWOOD.

The object of this and subsequent papers, is to ascertain the practical value of the few tests already proposed for detecting the presence of impurities in commercial alkaloids; and by further experiments endeavour to throw some additional light upon this important subject. I obtained for the present experiments seven samples of Sulphate of Quinine, by the following makers:—Howard and Sons, of London; Jules Thomas and Co., of Argenteuil; Lamoureaux and Gendrot, of Paris; Thiboumery and Dubosc, of Paris; Fred. Jobst, of Stuttgart; and two samples purchased in England but evidently of foreign manufacture. Five of the samples stood the tests of the British Pharmacopœia, but De Vry's iodide test showed the presence of *traces* of cinchonine and quinidine. The two samples purchased in England were not tested in this way, owing to the small quantity sent me. The remarkable purity of so many commercial quinines is highly gratifying. Having ascertained the value of the samples upon which I was to work, I next directed my attention to the different appearances presented by the various samples, when seen under the microscope. Owing to the quinines having been packed in bottles, the crystals were somewhat broken, but they still retained their shape sufficiently perfect, to make a comparative examination of some value. It would be interesting to determine how far the presence of an impurity in a crystalline substance modifies or materially alters the normal shape of the crystals; and whether by careful crystallization, the microscope may not detect the presence of a crystalline impurity, by its *separate* crystallization. I have made several experiments on this point, and hope at a future meeting to bring the subject more fully before the members; for the present I am anxious to elicit the opinions of microscopists.

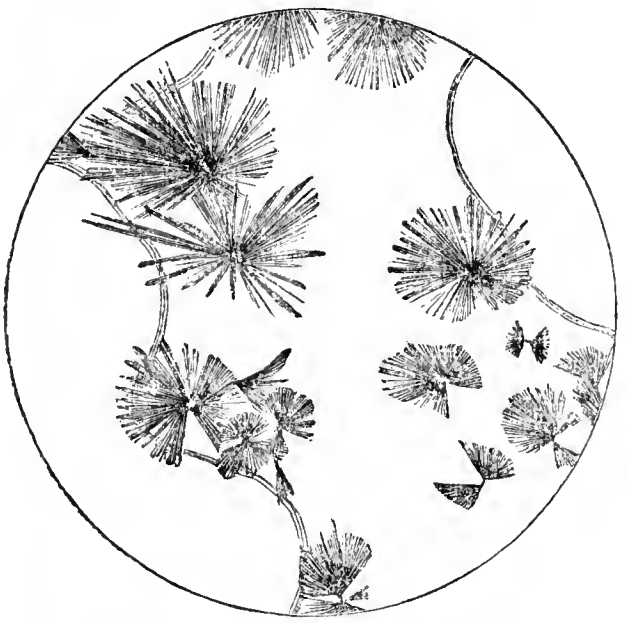
An examination of the photographs will show you at a glance the appearances presented by Howard's sulphate of quinine, and that by a Continental maker. Howard's is composed of opaque and transparent crystals, many of the opaque ones being of a very large size, and appearing like bundles or masses of crystals banded together. The foreign quinines contain more of the transparent and smaller crystals, but two of the samples contained amorphous quinine. I have



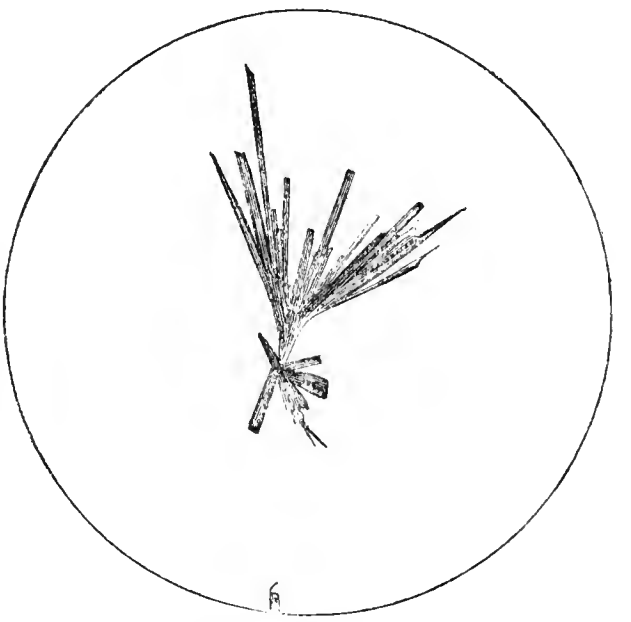
Tartrate of Quinidine and Tartrate of Cinchonine. 75 diam.



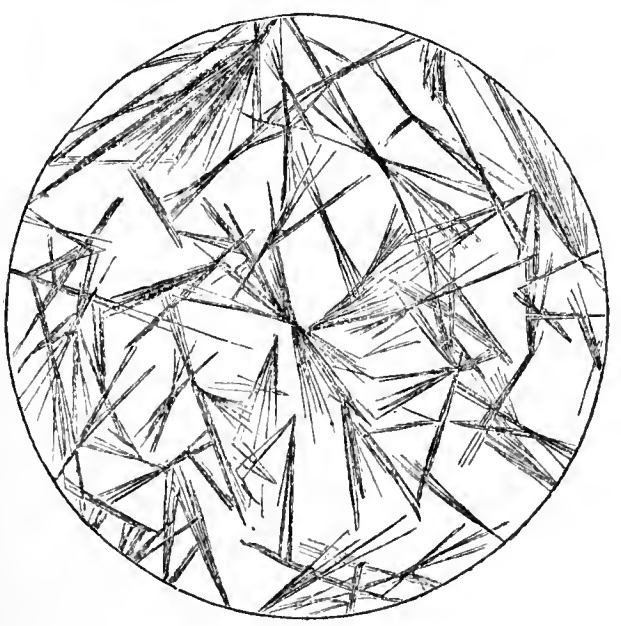
Sulphocyanide of Cinchonine. 75 diam.



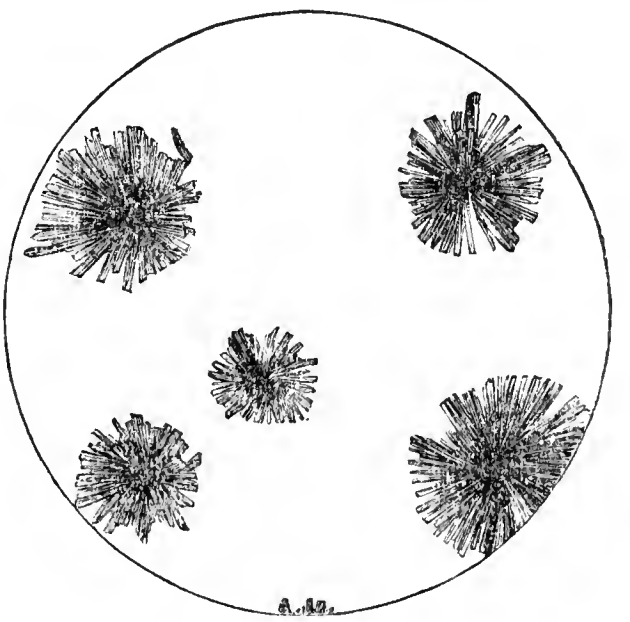
Sulphocyanide of Quinine. 75 diam.



Tartrate of Quinidine. 75 diam.



Tartrate of Quinine. 75 diam.



Sulphocyanide of Quinidine. 75 diam.

not had an opportunity of comparing sulphate of quinine by any other English maker, or a sample prepared as Br. Ph., with the foreign ones.

Mr. Stoddart's sulphocyanide test answers well when either *very minute* or *very large* quantities of quinidine or cinchonine are present in quinine. I have failed, however, to obtain decided results with a quinine known to contain five per cent. of impurities. There is one point to be noticed, that the purer the quinine is, the more decided and distinct the sulphocyanide of quinine crystals are deposited, and that the presence of quinidine or cinchonine affects more or less the shape of the crystals.

The sulphocyanide of potassium failed to give any decisive results with the samples of foreign quinines, and although a very large number of experiments were made, I could only infer the presence of quinidine and cinchonine by the less distinctive character of the sulphocyanide crystals. Sulphocyanide of potassium gives crystalline precipitates with quinidine and cinchonine, and also precipitates the quinine from the compound tincture as perfectly as from an aqueous solution.

The next precipitant tried, and from which I anticipated better results, was Iodo-hydrargyride of Potassium solution, prepared as recommended by Mr. Tuck at the Bath meeting, for detecting methylic alcohol. This solution gave a crystalline precipitate with cinchonine sulphate, and yellow amorphous precipitates with quinine and quinidine. The cinchonine crystals were small hairy tufts, somewhat resembling the crystals of tartrate of cinchonine.

A solution of 240 grains of neutral tartrate of potash in 1 ounce of distilled water, was found to give crystalline precipitates with quinine, quinidine, and cinchonine. The tartrate of quinine is precipitated in tufts of needle-shaped crystals, the quinidine in prisms, and the cinchonine in minute tufts.

I have not yet been able to decide whether the tartrate of potash will detect the presence of either of the alkaloids occurring as impurities in sulphate of quinine, but have found separate crystallization take place in a mixture of quinidine and cinchonine. At our next meeting I trust being able to detail further experiments with these and other of the alkaloids.

The photographs sent to illustrate this paper were all taken with artificial light, as follows:—One of the eye-pieces of the binocular microscope was fitted into a hole through the front of an ordinary wood camera. The prism was then pushed out so as to admit light up one tube only. The light from a *paraffine lamp* was by means of a $2\frac{1}{2}$ inch condensing lens, thrown through the object and tube of the microscope on to the focusing screen of the camera. By this means I was enabled to photograph any crystalline object with an exposure of ten minutes. The ordinary wet collodion process was used, and I have never had the least trouble in keeping the plates moist for that or even a longer time. I mention these matters in case any member should feel inclined to adopt photography as a means of copying microscopic objects. The great desideratum is an objective of good penetrating power.

Note.—The photograph of the micrometer will show the value of *actual* instead of *apparent* measurement of magnifying power, in microscopic investigations. All the photographs were taken with a $\frac{1}{4}$ *inch objective*, said to magnify 245 diameters.

The author of this paper is a chemist's assistant at Newcastle-upon-Tyne.

Mr. STODDART could not agree that the sulphocyanide test failed to detect quinidine at the point supposed by the author of the paper: on the contrary, it would detect so little as 1 per cent. of quinidine. However, it was needful to make the sulphocyanide solution by the direct solution of sulphur, according to the instructions which he (Mr. S.) had already published; the use of ordinary crystals of sulphocyanide was not a substitute for this. Mr. Stoddart spoke strongly in favour of using common and cheap

object-glasses in micro-photography rather than the highly corrected ones of first-class makers. Mr. Brady and Mr. Sutton, on the other hand, contended that the best results were obtained by the use of first-class objectives, correcting the focal distance according to experience for the difference between the visual and chemical foci.

REPORT ON SWEET SPIRIT OF NITRE.

BY W. LAIRD, PH. C., DUNDEE.

Twenty-one samples were sent from Dr. Attfield, apparently all procured from shops in England, some old and others recent. Following the course I adopted on a former occasion, I first comment on their external appearances, the most noticeable of which was the different effects shown by the mode of dispensing this article. Four of them were put up in stoppered bottles, and were full, bright, and clear as when they left the hands of the dispenser, while all the rest were more or less discoloured from the decomposition of the corks, which, in some instances, were almost as much consumed as if they had been in vials of dilute nitric acid. Some of them had leaked or evaporated so much as to be more than half empty, so little being left that they could not float the hydrometer.

No. 7, 10, and 19 were the only samples having presentable corks in them, owing apparently to the sweet spirit of nitre therein being less acid than that in the others, though they had evidently been dispensed with equal care. The natural deduction from this is, that in every case where spirit of sweet nitre is likely to be kept for any length of time, whether in family or ship's medicine chests, it ought to be put up in stoppered bottles. I forward some of the corks to show their state. All the samples were acid, No. 7 and 10 least, and No. 9 most, as will be seen on reference to the accompanying vials I have sent, as being better than any written description of the degrees of acidity. Each of them contains one grain of iodide of potassium and fifteen minims of sweet spirit of nitre with water, showing the free acid by liberation of iodine. No. 10 is now almost colourless, the small portion of iodine having been absorbed by the cork. No. 9 shows the effect of neutralizing the acid with Mag. Carb., and is shown with a hope of eliciting an answer to the question, "Should sweet spirit of nitre be neutralized before being sold, or should we sell it just as it chances to be?"

The sp. g. of No. 5, H. and S. was ·830, No. 12, B. and S. ·837, and No. 16, T. C. P. ·838, showing them to have been made according to the Ph.L. instead of the Ph.B. No. 7, G. Y. S. ·842, No. 9, A. and H. ·840, No. 15, W. R. and C. S. ·848, No. 18, ·845, and No. $\frac{1}{2}^{8}$, ·840, are as nearly equal to the Ph.B. strength as could be desired. Nos. 8, J. P., 10, W. M., 13, R. C. P., 14, G., and 19, T. S. G., were all ·850, which, according to this and previous reports, seems to be the strength most commonly sold. No. 2, F. M. R. is marked as having been originally ·843, but is now only ·860, having, I presume, suffered this diminution of strength by evaporation round the wasted cork,—a dilution equal to its having rather more than 10 per cent. of water added. No. 4, W. Y. is ·930, and No. 11, T. P. is ·928, the bottles being quite full, the corks in good condition, and No. 11 tied over and sealed just as it left the sellers' hands. I have, therefore, no choice left but to say of them that if originally good, they have been *adulterated* with *equal parts* of *water*.

So far this inquiry has been satisfactory, having shown a much better result than my previous one,—a tenth part only being chargeable with *wilful adulteration*, whereas in my former one there were rather more than a *third*. Let us

earnestly hope that under the auspices of the New Pharmacy Act, along with the superior spirit of emulation engendered by the workings of the British Pharmaceutical Conference, future reports will show less and less till it can be said that "Adulteration is a vice unknown in British Pharmacy;" then, and not till then, will our Conference have fulfilled its mission.

Since writing the foregoing I have had other four samples brought in. D. G. ·950, P. G. D. ·855, D. H. F. ·845, and G. B. T. ·930. The first is a bad sample of adulteration sold for 3*d.* per ounce, and contains two parts water to one of sweet spirit of nitre. The second, fair. The third, pure. The fourth is half water, and sent out unlabelled.

The PRESIDENT said, that his experience of the process for sp. æther. nitr. in the Brit. Pharm. was favourable to it, the product being perfectly satisfactory.

Mr. SUTTON could not accept as very definite the iodine test described by the author of the paper; certainly it was not so, unless the same sample of iodide of potassium was always used.

Mr. DEANE was not aware of any objection to the use of an alkaline bicarbonate, or of a proper quantity of liquor potassæ to neutralize free acid of sp. æther. nitr. when it had to be dispensed in combination with iodide of potassium.

Professor ATTFIELD confirmed the President's remarks as to the results of the formula given in the B. P. He found that the junior students were always able to make a satisfactory preparation by following the directions of that formula.

ON THE ADULTERATION OF ANNATTO.

BY W. LAIRD, PH. C., DUNDEE.

The Conference meeting this year in the chief city of a great agricultural district will, I hope, be held as a sufficient reason for my bringing under notice a subject not strictly pharmaceutical, but rather agricultural, *i. e.* adulteration of annatto. I have heard that there is a saying in some parts of England, that "annatto now-a-days won't dye." I don't wonder at it, if the sample before me is anything like a fair sample of what is usually supplied to the trade. We are told "annatto is obtained from the seeds of *Bixa Orellana*, is imported into Europe in cakes and usually made up in England into rolls before sale;" we are further told that "the best annatto is known as roll annatto." This sample, when received about two years ago, was labelled "roll annatto," and seemed what its name implied, good, of a beautiful deep orange colour, and pliable, something like a well beaten pill-mass. In my unsuspicious ignorance I thought it of first-rate quality. A short time after, on having occasion to sell some, I found it studded with minute crystals of salt, but, being busy, paid no attention to them till some time afterwards, I found that the crystals had largely increased in size and number. I supposed the salt had been added to help to keep it moist, or it might be to increase weight and profit. I thought, however, that this was at least a safe if not a necessary adulteration. As time went on my beautiful annatto began to lose its rich colour and softness, becoming shrunk, hard, and mottled, like a piece of brick made of badly cleaned clay. Being now thoroughly convinced of the roguery of some one, I was desirous of knowing to what extent and how it had been adulterated. I weighed out a hundred grains from a thin section of one of the rolls, digested it for twenty-four hours in two or three ounces of spirits of wine, boiled the residue in two ounces more, then put it into a percolator, passed spirit through it till it came off colourless, finishing off with ether, which also came through colourless, thus making sure of having thoroughly exhausted it of the "orelline;" on drying and weighing the residue

I found it to be about 85 grains, a pretty fair percentage. On boiling a small portion in water, cooling, and testing with iodine, it gave the blue starch reaction very strongly. Under the microscope it looks like what is sold for "linseed meal," mixed with minute portions of an emerald-green substance.

These results are not before the meeting with that exactitude I should have liked, but they are sufficient to show that roll annatto, as supplied to the trade, instead of being the best annatto, is merely a paste of farina and salt, coloured with about fifteen per cent. of annatto.

It may be that the merchants are not able to sell it pure at the price charged, 1*s.* 4*d.* per lb. Let them give it pure and charge a fair price whatever it may be, the honest dealer will not refuse it.

Mr. J. D. Smith said that the members of the Conference from a distance would do a practical service to chemists in the country if they could tell them where to get good annatto. They could hardly sell a pound of annatto now-a-days without having it returned as being adulterated. They would be glad to sell pure annatto if they could get it.

The President said that annatto was no longer grown in the British West Indies, but he thought he might say that the whole came from the French colony of Cayenne, and it certainly was grossly adulterated. He was glad to know that there was a possibility of its being grown in English colonies, as a specimen prepared in Guiana had been sent to him, and most favourably reported on by a London importer who had seen it.

Mr. Evans called attention to the fact that one sort of annatto was used for butter and another for cheese. What was usually sold was certainly "a villainous compound." He had reason to believe that attention was being given to the reintroduction of the manufacture in the British West Indies.

Professor Attfield said that no better illustration could be given of the use of their discussions than the present. A crying evil, felt by the trade throughout the country, had been now exposed, and the many thousands of reports of this discussion which would be circulated throughout Europe and the colonies would tell those who could produce a pure article that they would find a ready market in England.

REPORT ON THE QUANTITY OF ALKALOID IN VARIOUS SPECIMENS OF CITRATE OF IRON AND QUININE.

BY J. C. BRAITHWAITE.

(Continued.)

Through the kindness of Dr. Attfield, I recently received ten fresh samples of this valuable medicine, and it is gratifying to find that they contain more of the alkaloid than those I have previously reported on; nevertheless there is still plenty of room for improvement, as it will be observed that out of the ten samples one contains only about *one-fourth* of the proper quantity, another about *one-third*, two more about *one-half*, two others *not quite three-fifths*, whilst the remaining four yield about the legitimate proportion.

As in my former papers, I have numbered the different specimens progressively in accordance with the amount of alkaloid contained in them.

No. 25. This specimen was received wrapped in oiled paper. It had cohered into a glue-like mass of an olive-green colour, and all trace of its ever having existed in the form of scales was obliterated. When exposed to the air at a temperature of 60° it remained unaltered. It dissolved readily in water, yielding a solution of a golden-green colour, which formed a slight deposit. It had an acid reaction on test paper, and a moderately bitter, non-chalybeate taste. Ammonia produced a more scanty precipitate than in any of the succeeding

specimens, this separated readily, and, when dried, had a lightish-brown colour and resinous appearance.

From two analyses of twenty-five grains each I obtained 0·95, 0·99, mean 0·97, equal to 3·88 per cent. of quinine or 6·062 per cent. of its citrate. This was soluble in ether, yielding a pale-coloured solution.

No. 26. This occurred in small scales of a darkish olive-brown colour, which were somewhat coherent. When exposed to a temperature of 60° it remained unaltered. It dissolved more readily in water than No. 31, yielding a dark olive-brown solution, with a somewhat reddish tinge, and pretty clear, and having a moderately bitter, non-chalybeate taste and an acid reaction on test paper.

From two analyses of twenty-five grains each I obtained 1·39, 1·36, mean 1·375, equal to 5·5 per cent. of quinine or 8·59 per cent. of its citrate. The dried quinine was of a dark colour, of a resinous appearance, and nearly all dissolved in ether, yielding a somewhat turbid solution of a pale yellow colour.

No. 27. Consisted of small scales having a dull yellowish colour. Exposed to the air at a temperature of 60° it did not absorb moisture. It dissolved readily in water, yielding a golden-green solution, but having rather less of the greenish tinge than No. 25, and forming a slight deposit. This solution had a non-chalybeate taste, and was more bitter than either of the preceding; it had an acid reaction on test paper.

From two analyses of twenty-five grains each I obtained 1·97, 1·95, mean 1·96, equal to 7·84 per cent. of quinine or 12·25 per cent. of its citrate. The dried quinine was resinous and of a light brown colour, and dissolved almost entirely in ether, yielding a pale yellow solution.

No. 28. Occurred in large golden-yellow scales, having rather less lustre than those of No. 35, but much resembling them. When exposed to a temperature of 60° it was unaltered. It dissolved readily in water, yielding a clear golden-yellow solution, having an acid reaction on test paper, and closely resembling that of No. 27 in taste.

From two analyses of twenty-five grains each I obtained 1·98, 2·02, mean 2·00, equal to 8 per cent. of quinine or 12·5 per cent. of its citrate. The dried quinine was of a light brown colour and resinous, and was almost entirely dissolved in ether, yielding a clear, pale yellow solution.

No. 29. Was composed of large scales having a bright golden-yellow colour. When exposed to the air at a temperature of 60° they were unaltered. It was readily soluble in water, yielding a golden-yellow solution, a shade darker than the preceding, and having an acid reaction on test paper and a non-chalybeate and bitter taste.

From two analyses of twenty-five grains each I obtained 2·12, 2·08, mean 2·1, equal to 8·4 per cent. of quinine or 13·125 per cent. of its citrate. The dried quinine was of a light brown colour and resinous, and dissolved in ether, yielding a pale yellow solution.

No. 30. Occurred in large scales of a dark golden-yellow colour. When exposed to the atmosphere at a temperature of 60° it was unaffected. It readily dissolved in water, forming a clear golden-yellow solution, which had an acid reaction on test-paper and a non-chalybeate and bitter taste.

From two analyses of twenty-five grains each I obtained 2·39, 2·4, mean 2·395, equal to 9·58 per cent. of quinine or 14·968 per cent. of its citrate. The dried quinine was light-brown coloured and resinous, and nearly all dissolved in ether, forming a pale yellow-coloured solution.

No. 31. Consisted of medium-sized scales of a yellowish-brown colour. When exposed to the air at a temperature of 60° it underwent no change. Was not so readily soluble in water as Nos. 26 and 27, but it resembled them in colour and was slightly turbid. The solution had a strongly bitter, non-chalybeate taste and an acid reaction on test paper.

From two analyses of twenty-five grains each I obtained 3·77, 3·73, mean 3·75, equal to 15 per cent. of quinine or 23·437 per cent. of its citrate. The dried quinine had a dark blackish-brown colour and resinous appearance, and nearly all was soluble in ether, forming a deep reddish-brown solution.

No. 32. Was composed of small, dark, olive-brown scales, somewhat lighter in colour than No. 26, and having more of a greenish tinge. Exposed to the air at a temperature of 60° it remained unaltered. It dissolved in water with the same facility as No. 26, yielding a dark olive-brown solution with a somewhat reddish tinge, and throwing down a slight deposit on standing. The solution had an acid reaction on test paper and a strongly bitter, non-chalybeate taste.

From two analyses of twenty-five grains each I obtained 3·83, 3·75, mean 3·79, equal to 15·16 per cent. of quinine or 23·68 per cent. of its citrate. The dried quinine had a dark brown colour and resinous appearance; it nearly all dissolved in ether, yielding a darkish and somewhat turbid solution.

No. 33. Occurred in smallish scales of an olive-brown colour with a greenish tinge. Exposed to the air at a temperature of 60° it was unaltered. It did not dissolve in water quite so readily as Nos. 26 and 27, and yielded a dark olive-brown solution with a somewhat reddish tinge and slightly turbid. It had an acid reaction on test paper, and an intensely bitter non-chalybeate taste.

From two analyses of twenty-five grains each I obtained 3·89, 3·83, mean 3·86, equal to 15·44 per cent. of quinine or 24·12 per cent. of its citrate. The dried quinine was of a lightish brown colour and resinous aspect. It nearly all dissolved in ether, but the solution was dark-coloured and turbid.

No. 34. Consisted of small scales of a light olive-brown colour with a slight greenish tinge. Exposed to the air at a temperature of 60° it was unaffected. It was not so readily soluble as Nos. 26 and 27, but yielded a clear solution of a dark olive-brown colour with a reddish tinge. The solution had an acid reaction on test paper and an intensely bitter, non-chalybeate taste.

From two analyses of twenty-five grains each I obtained 3·98, 4·02, mean 4·00, equal to 16 per cent. of quinine or 25 per cent. of its citrate. The dried quinine was dark-coloured and had a resinous appearance. It nearly all dissolved in ether, yielding a dark-coloured, turbid solution.

No. 35. Was composed of large, bright, golden-yellow scales very similar to those of No. 28, but having more lustre. When exposed to the air at a temperature of 60° no change took place. It dissolved very readily in water, forming a fine, clear, golden-yellow solution which had an acid reaction on test paper and an intensely bitter, non-chalybeate taste.

From two analyses of twenty-five grains each I obtained 4·27, 4·23, mean 4·25, equal to 17 per cent. of quinine or 26·56 per cent. of the citrate. The dried quinine was of a light colour and resinous aspect, and dissolved entirely in ether, forming a dark clear solution. This specimen was taken from some prepared by my own formula, an excess of quinine being purposely introduced.

It is, perhaps, worthy of note that these specimens appear to have been prepared by two different processes, for Nos. 26, 31, 32, 33, and 34 occurred in more or less darkish-coloured scales, yielded dark-coloured solutions, and the quinine precipitated from them, when dried, was of a dark colour, whereas Nos. 25, 27, 28, 29, and 30 had scales of a more or less golden-green colour, yielded golden-yellow solutions, and the quinine precipitated from them, when dried, was of a light colour. I observed also that the quinine of the last series was much whiter at the time of precipitation than that of the first, and separated from the solutions with greater facility. No. 35, used in comparison, agreed in character with those of the last series.

Mr. Baker (Swaffham) hoped that at least the names of the makers of a good preparation would be published, that it might be known where to procure it.

ON PURE WHITE GUTTA PERCHA.

BY F. BADEN BENGER.

The demand for this substance, for dental purposes, is now sufficiently established to justify me in making a few remarks on it and its preparation. I have examined specimens of the so-called "pure white gutta percha" now commonly sold, and find that for the most part they may have been designated almost as correctly "pure white oxide of zinc," being made up with this substance in very large proportions, and I believe thereby rendered less tough, durable and fit for the purpose; this opinion has been strengthened by the fact that persons to whom the pure and afterwards the commercial article have been supplied, have frequently complained of the inefficiency of the latter. I am further induced to describe the process I use, by the very high price required by makers of the really pure substance.

A good sample of crude gutta percha will yield at least 75 per cent. of the pure resin. Some care should be taken to obtain a specimen with as little impurity as possible. The bottle marked No. 1 contains some of the kind I find best; it is imported in roundish blocks, which are exceedingly hard and difficult to cut, but any of the large gutta-percha manufacturers will supply the same torn into fragments similar to the accompanying specimen. Four ounces of this digested with 5 lbs. of methylated chloroform for a few days, will form a solution sufficiently fluid to filter through ordinary bibulous paper; this should be conducted in such a manner as to allow little or no loss of chloroform by evaporation, the apparatus for filtering volatile liquids described in Mohr and Redwood's 'Pharmacy' answering the purpose; the addition of another pound of chloroform rendering the filtration more expeditious. To the filtered solution, which should be bright and nearly colourless, add an equal bulk, or a sufficient quantity of spirit of wine to precipitate the gutta percha, which will separate from its solvent as a white bulky mass; this should be rinsed with spirit, pressed in a cloth, and dried by exposure to the air, its condition is then that of the accompanying specimen, marked "No. 2," perfectly white, but too porous for dental use; it should then be boiled for half an hour in a porcelain capsule and rolled in sticks whilst hot, as specimen "No. 3." The chloroform can now be separated from the spirit by the addition of water, and lastly the spirit from the water by distillation, at the leisure of the operator.

There is, therefore, no reason why the chemist should not prepare this substance himself, and if he is careful to prevent the loss of chloroform and spirit in the process, its reduced cost and greater purity will compensate him for the trouble.

A LETTER ON THE RELATION OF REMUNERATION TO PHARMACEUTICAL RESPONSIBILITY.

BY R. W. GILES.

The subject of pharmaceutical ethics, which, in its general aspect, was so ably brought before the Conference two years ago, at Nottingham, is naturally suggested for further consideration at the present time, in certain phases connected with the Pharmacy Amendment Act and also with a recent deplorable catastrophe, which can scarcely be called an accident, resulting in the death of a young lady from this place by an improper dose of a most improper solution of strychnia. Regretting much that circumstances will not allow me

to be present at the Norwich Conference, but being unwilling to be altogether shut out of the discussion which will no doubt take place upon these and similar topics, I venture to send an epitome of my opinions in the following remarks.

Up to the present time British pharmacy has occupied a very dubious position. This has at last been recognized by the Legislature, who have been induced, after much unsuccessful pressure, to provide a remedy by defining the qualification which shall be required from all pharmaceutists and protecting them from the aggression of unqualified competitors.

This is a new state of things; and it concerns us much to form a right estimate of our privileges and responsibilities under the new *régime*, not forgetting that the two are reciprocally associated. Hitherto the reciprocity has been altogether one-sided! the public insisting peremptorily enough upon *our* responsibilities (demanding, indeed, an infallibility, which is not human), but privileges had we none! The external relations of pharmacy have, therefore, been anything but satisfactory *to us*, nor do I think that they have proved advantageous, to the public; for although there are many amongst us who recognize and conscientiously fulfil the highest requirements of our calling, we dare not assert that pharmacy is well represented in the practice of the majority.

Pharmacy has, in fact, struggled against unfavourable conditions, and we need not be surprised if under these conditions it has not risen to the level of its theoretical standard. From this cause I venture to think that all its existing anomalies have proceeded; but we may hope that the end of these things is approaching, and that a time is coming when pharmacy will have a fair field for its development, amongst a body of practitioners universally influenced by a feeling of professional responsibility.

Granted that "*pharmacy is a trade,*" it is nevertheless a trade with exceptional responsibilities, and demanding exceptional qualifications, which take it out of the category of ordinary trades. It is, in the first place, incumbent upon pharmaceutists to fulfil these requirements, which again have their correlative claims for recognition upon the public in whose service they are rendered. We have lately seen these claims urged with considerable force in the public journals, and it appears that there is a disposition at the present time to give them favourable consideration. I am not so sure that there is not a little danger of pushing them too far, and of somewhat overlooking or taking for granted the obligations upon which alone they can be fairly rested. The question of remuneration is most important, and there is nothing undignified or unprofessional in discussing the subject of prices; but we should make a fatal mistake if we attempted or desired to regulate *the form* in which medicines are prescribed, with the object of increasing our own profits. This would be in effect to assume that the sick were made for the chemist, and not the chemist for the sick. The only consideration which ought to weigh in this matter is the convenience and advantage of the patient, and I hope that if other views have appeared to be entertained they will be promptly disavowed by the intelligence of the trade. It is, in my opinion, absurd to think of reverting to the old system of draughts, or to expect that medicines shall be prescribed in four or six part bottles, to the exclusion of doses by the tablespoon, teaspoon, or by drops, to be diluted when administered at home. There are many good reasons for the adoption of these forms independent of economy to the patient, which is in itself a good reason. If to dispense such medicines is not remunerative, the fault is our own, for we have it in our power to charge a remunerative price; and this brings us to the question of prices, which it is fairly within our province to discuss. I cannot think that the present average prices for dispensing are

satisfactory, but it never appeared to me that this subject could be approached with advantage until some legislative measure similar to the Pharmacy Amendment Act had been passed. Low prices are generally the effect of excessive competition, and what hope was there of dealing with the question of prices when the competition was between the qualified and conscientious pharmaceutist, and the irregular interloper who tacked a degenerate pharmacy on to his miscellaneous pursuits? We may, however, now profitably devote some of our attention to the anomalies by which we find ourselves surrounded.

First, we may remark that while our business is more responsible than any other trade and demands from us greater sacrifices, it is one which offers perhaps the smallest rewards of any. As a trade its returns are very small, while its claim to a professional principle of remuneration for that portion of its duties which are certainly quasi-professional is not recognized. All the operations of the dispensing counter are special, and it is a maxim in manufactures that no special operation pays. This maxim ought therefore to govern our dispensing prices, and to secure for them something like a professional rate of remuneration. But in practice, I believe, no trade renders so large an amount of personal service for sixpence,—the usual price of half-a-dozen pills. I beg to doubt whether any pharmacy could be supported by a trade consisting entirely of making heterogeneous prescriptions of six pills for sixpence.

Second, it is a curious inconsistency that our remuneration is in the inverse order of our responsibilities. For example, it is more profitable to us that the qualified assistants whose services we find it necessary to secure should be engaged in the trivial occupation of vending perfumery, hair-washes, and the like, than that they should be employed in the exercise of their higher qualifications in the responsible duty of dispensing prescriptions, often a duty of considerable anxiety. I do not of course mean that the percentage profit upon the goods sold is greater in the first case than in the last, but that an assistant can make a larger *net* return in the one case than in the other, and simply because the one trade is done by the dozen, while every individual transaction of the other is the subject of a separate manipulation. I do not think that this fact is sufficiently appreciated, but it helps to explain another anomaly, viz. that dispensing charges are usually lowest where dispensing forms but a small portion of the trade, and highest where the dispensing predominates. Ordinarily, increased production diminishes the cost of supply; but the immense cost of dispensing operations forces itself practically upon the experience of the dispensing pharmaceutist, whereas the apparent large profit upon the cost of materials misleads the chemist and druggist by fallacious contrast with his retail transactions. The same topsy-turvy rule prevails if we confine our view to the varied operations of dispensing only. When we dispense single draughts or ordinary mixtures in dilute doses, we receive the largest profits with the smallest risks and the least anxiety; but when we have to dispense concentrated preparations, frequently of deadly ingredients, to be administered in drops, how easy is it for a fatal error to occur in the compounding, while any error in the label,—say the substitution of a wrong label,—would almost certainly be dangerous! For these critical operations our remuneration is little more than that of retail trade.

This state of things must be wrong; the question is how it can be remedied. It has been sometimes suggested that our scale of charges should be governed by the number of doses, and although I do not think this principle can be applied undeviatingly, I do think that it ought to receive more consideration, and I hope that some advocate of the system will support his views at the Norwich meeting.

It would be sanguine to expect an immediate remedy for a case of long standing, nor are sudden changes to be desired or to be trusted. We must patiently wait for the beneficial operation of the Pharmacy Amendment Act, first by a slow process weeding out that irregular competition already referred to, in the place of which we may hope to see a laudable emulation in excellence rather than in price, giving us a higher standard, as well as greater uniformity, throughout the trade. Many will remember the sweeping accusation recently made in one of the medical journals by a medical practitioner, that if the same preparation were taken into half-a-dozen different chemists' shops, the medicine would scarcely correspond from any two of them. Unfortunately, our own experience tells that there is too much truth at the bottom of this damaging imputation, and while it is so we cannot hope that pharmacy will take its rightful place in public estimation,—which cannot be secured by the merits of a few, but must be deserved by the conduct of the many. Simultaneously, it is to be hoped that the practice of preparing our own compounds will become general, and that the time will soon arrive when a laboratory will be considered an indispensable part of every pharmacy. Perhaps I am over-riding a hobby, but I hope to be excused for saying that there is only one way by which a pharmaceutist can acquire the proper interest in, and have the proper guarantee of the quality of his preparations,—of course I exclude chemicals,—and that way is by manufacturing them on the premises. There is, on the other hand, no cause so productive of underselling, or so prejudicial to our professional aspirations, as the practice which has grown up comparatively of late years of buying everything ready-made, whereby we become the mere chapmen of drugs.

Although we may not, on the score of a vested interest in the profits of the supply, interfere with the form in which prescribers may think fit to order the medicines which it is our province to dispense, we may upon totally different grounds (viz. in the interests of the public safety) set ourselves resolutely against that dangerous system of prescribing deadly ingredients in concentrated forms, such as recently caused the distressing death of Miss Campbell. Such medicines as that placed in the hands of this unfortunate young lady, are not fit for the manipulation of any but a competent and careful pharmaceutist. What an outcry would be raised if one of us permitted a partially-trained apprentice to manipulate such a solution, in the event of a similar casualty arising from *his* blunder! It is not only a duty to the public, but it is due to our own security, that we should resist this which, I am told, is a growing practice in London, and which we may expect will extend (as London usages commonly do) to the provinces. It is not just that we should be exposed to the risk of compounding these preparations in the hurry of business, when any miscarriage would be fraught with danger, for which we should be legally (although the prescriber might be morally) responsible. I have clearly made up my mind that when it is necessary to dispense these objectionable medicines, our duty to the public requires that we should make them the subject of special precautions, and our duty to ourselves requires that they should be made subject to special prices. We might also represent to the profession (with whom our relations are now so much improved as to be generally of a frankly confidential character) the inadvisability of prescribing poisonous quantities of any ingredient in any single bottle containing medicine for internal administration; especially in any bottle the capacity of which would permit of its contents being accidentally taken at a draught; and I think that any bottle containing a poisonous ingredient in sufficient quantity to endanger life—whether intended for external use or for internal administration—ought to bear conspicuously a "Poison" label. This perhaps might be regarded as a little gentle pressure upon those prescribers

who were obnoxious to a prudent suggestion. There are, of course, numerous precautions affecting the accurate execution of those duties which are exclusively ours, which it is incumbent upon us to observe. It is not necessary to describe any of them in this communication; it is sufficient for the ethical treatment of the subject to acknowledge that our responsibilities obviously involve the adoption of every precaution which offers additional security for the safety and welfare of the sick, whose lives and whose health depend upon our accuracy, and, let me add, upon our honour. Taking a selfish view of the case, he is an unwise man who does not secure his own peace of mind by surrounding himself with every safeguard which can diminish the risks of a business begirt with perils. In thus endeavouring to bring about a safe system of prescribing and supplying medicines, we shall deserve the gratitude of the public, and shall not incur the reproach of attempting to use the Pharmacy Act as an instrument for establishing an injurious monopoly which, above all things, it is desirable that we should avoid.

The views which I have endeavoured to place before you in the foregoing remarks resolve themselves into this: Let us complete our own reform, and when we have put our house in order internally, we may hope to arrange our outside relations with the public upon a mutually advantageous footing. We must have patience, and must not expect too much. Moreover, we must be prepared to give a full equivalent in services for all that we demand in exchange. We ought not to desire (most certainly I do not desire) extravagant prices, but we have a right to expect such prices as will enable us to supply medicines of genuine quality, reliable for the cure of disease, compounded and dispensed by qualified assistants who shall be adequately remunerated for their labours, and such as will afford to the industrious pharmaceutist a reasonable prospect of providing for his latter days without the aid of the Benevolent Fund. We also have a right to expect that the importance of our duties, when conscientiously discharged, and the nature of the qualification which we are required to possess, should raise us in the social scale somewhat above the status of ordinary trades, and that the profession of pharmacy, instead of proving, as it now does, an obstacle to the honourable status of a gentleman, should be held to imply all those qualities which make the name of 'gentleman' desirable.

RICH. W. GILES.

Mr. DEANE said that it was unquestionable that the profits of the drug trade were larger formerly than at present, although the working expenses of the chemist were now much increased, and he had to expend a much larger sum upon his technical training. It was desirable to obtain statistics, showing the reductions in profits that had occurred within a term of years, and he hoped that some one would lay these before some future meeting.

Mr. GOSTLING (Diss) also spoke on the relations of country chemists to this question.

(End of First Day's Sittings.)

THE DINNER.

On Tuesday evening, August 18th, at 7 o'clock P.M., a complimentary dinner was given to the visitors by the members residing in Norwich and the neighbourhood. R. Fitch, Esq., F.G.S., F.S.A., Sheriff of Norwich, and Vice-President of the Conference, occupied the chair; Mr. Cubitt, the vice-chair. Most of the officers of the Conference, the Vice-President and Secretary of the Pharmaceutical Society, the delegates from various provincial

chemists' associations, and all the Norwich members were present. The entertainment was characteristic of the liberal and hearty hospitality extended throughout the whole week by the Norwich chemists to their brethren from a distance. After the removal of the cloth, the chairman proposed the usual loyal and patriotic toasts; "Success to the British Pharmaceutical Conference" was well given by Mr. Fitch, and appropriately acknowledged by the President, Mr. Hanbury. "Success to the Pharmaceutical Society" was enthusiastically accepted at the instance of the Vice-Chairman, and responded to by the Vice-President of the Society, Mr. H. S. Evans. "The Local Committee" was proposed, in a telling speech, by Mr. Deane, Mr. Caley replying in a most pleasing manner. "The Officers of the Conference" were well cheered, at the suggestion of Mr. J. D. Smith, and returned thanks for the compliment through Mr. Brady and Prof. Attfield. "The Local Secretary" received the applause of resident and non-resident members the moment his name was mentioned by Mr. Reynolds; in responding, Mr. Sutton alluded to the satisfactory manner in which he had been assisted by other members of the Local Committee. "The Best Interests of Pharmaceutical Literature" was a toast brought forward by Mr. Ince, and associated with the name of Mr. Brough, who made a suitable response. The health of "The Chairman" was proposed by Mr. Hanbury, and duly acknowledged. Some amusing remarks by Mr. Brough on "Fraternal Relationship," Mr. Schacht on "Early Rising," the London Secretary on "The Enviable Position of the Happy," and remarks by most present on "Good Fellowship," closed this successful social gathering.

ORIGINAL AND EXTRACTED ARTICLES.

NOTE ON THE DETECTION OF PHOSPHATE OF LIME IN SUBNITRATE OF BISMUTH.

BY DR. REDWOOD.

In a brief notice I gave, in the last number of this Journal, of the adulteration of subnitrate of bismuth with phosphate of lime, I alluded to a test recently published by Mr. Roussin. I am informed by Messrs. Howard and Sons, of Stratford, that they have found this test fallacious, as continued boiling causes a precipitate of bismuth itself when no phosphate is present. They suggest the following modification of the test, by which they say one-third of a grain of phosphate of lime is easily detected:—

"To one part of the salt of bismuth dissolved in weak nitric acid add two parts of citric acid; dissolve with the aid of a little water; add an excess of solution of ammonia, and boil. Any phosphate present will be thrown down with continuous boiling of the solution."

Although absence from home prevents my adding my own experience on the subject, I am anxious, on the unquestionable authority of Messrs. Howard, at once to guard those who may have been induced to use Mr. Roussin's test against the erroneous conclusions to which it appears it may lead. In the cases referred to in my former note, I had obtained evidence of the adulteration indicated by other and perfectly trustworthy means before my attention was directed to Mr. Roussin's test.

THE INTRODUCTION OF CINCHONA TO THE ISLAND OF JAMAICA.

"How great a matter a little fire kindleth" may, in spirit, well apply to the present acute interest which attaches to the important question of the increasing demand for cinchona. Two or three centuries ago, the water-supply of a certain district, derived from a small lake or pool in Peru, became embittered by the falling into it of some cinchona-trees, so that no one near would use it save one close at hand, who, stricken with fever, could obtain the means of quenching his thirst from no other source, and he in consequence quickly recovered. This circumstance becoming known, others who were ill from fever drank it likewise, with a similar result; and from that time bark was destined to become perhaps the most valuable article, certainly in hot climates, in the curative *armamenta* of the physician. In 1638, or thereabouts, the Spanish viceroy's lady, the Countess of Chinchon, was attacked by fever at Lima; and she, benefiting by the use of the remedy which had been found efficacious in other instances, brought it more prominently into notoriety, and finally gave it its popularity; hence the name of Chinchona, Pulvis Comitissæ or countess's powder. Its introduction into Europe through the hands of the Jesuits, at the instigation of the countess, readily explains the appellation of Jesuits' bark; and its employment in large quantity at Rome by an eminent prelate, the Cardinal de Lugo's powder. From the moment of the discovery of its febrifuge properties has the demand for cinchona steadily increased. At the present time, whilst its application to disease is greatly extending, every one may not know that the supply from the South American forests has been yearly decreasing. The attempts, however, which have been made to cultivate cinchona in other parts of the world are promising; and it is not unreasonable to suppose that, at no far distant period, the demand for quinine and the cortex from whence it is extracted, will be supplied in such a way as to considerably reduce the present high market price of these two articles. Amongst the hopeful occurrences in this respect are the attempts that have been recently made to cultivate cinchona in the island of Jamaica, and the government of that colony has now felt itself justified in prosecuting the matter in a thoroughly systematic and extensive way. There are those who are fully persuaded that cinchona may readily become one of the staple commodities of the island; and, if so, Jamaica has an enviable commercial prosperity in its grasp. It was in the early part of 1866 that attempts were first systematically made at Cold Spring to propagate cinchona in the colony, under the direction of Mr. Robert Thomson. They entirely fulfilled the expectations that had been formed. In the beginning of 1867, the formation of government plantations was commenced, with 800 plants that had been reared at Cold Spring. The first point was the selection of suitable sites, at an elevation of from 3000 to 6500 feet above the sea; but no difficulty was experienced in obtaining what was wanted in the Blue Mountain and St. Andrew's ranges, the climate of which offers a close similarity to that of the native habitat of the cinchona. The Blue Mountain range runs up in parts to 8000 feet, but on an average it is no less than 5000 feet. St. Andrew's may be about 5100 feet in its highest portion; but there are extensive tracts on the east and west side of the former, ranging in level between 3000 and 6000 feet, which are well adapted for the cultivation. Hitherto the only produce there has been coffee, and this has been planted in the central parts and the southern slopes, as being more accessible to Kingston. Coffee has also been grown in the St. Andrew's range, but only on its eastern side. There are, then, plenty of plantation sites adapted to the growth

of those species of cinchona which flourish at a level of between 3000 and 5000 feet above sea, including *C. succirubra* (3000 to 4000 feet), *C. Calisaya* (4000 to 5000 feet), and *C. officinalis* (5500 to 6500 feet). Other districts have been recommended; for instance, Stoneyhill and Newcastle, about ten miles from Kingston; but these are only about 1800 to 2500 feet above sea level. In the Blue Mountain range those conditions of moisture and latitude which are so active in assisting the formation of quinine are to be found in perfection. Before proceeding to name the varieties of cinchona which are most likely to be sucessfully cultivated, we may state the results already obtained, so far as our information goes, up to the present time. In a report which Mr. Thomson made to the Government for the year ending September, 1867, it appears that from the growth of cuttings, and seeds furnished by Dr. Hooker from Ceylon, there were in Jamaica 25,000 plants in a state of health, consisting of *C. Calisaya*, *C. succirubra*, *C. officinalis*, *C. micrantha*, and *C. Pahudiana*, in the following proportions respectively:—1500, 14,000, 5000, 1500, 3000; making a total, as before stated, of 25,000. Mr. Thomson proposed to plant 50 acres with about 400 or 500 plants to each acre; and to offer for sale some 5000 to 10,000 young trees. The latter has since been announced to take place shortly. It may be mentioned, as showing the rate of growth of the cinchonas, that in May, 1867, a score of *C. succirubra* were transferred to an altitude of 3700 feet when they were about six inches in height, and at the early part of 1868 they had reached the height of about 3 feet; but a few plants which were bedded out in 1867, it seems, have actually attained to 20 feet. This latter fact, as has been observed, sufficiently proves the adaptability of the soil for the purposes of cinchona growth. Recently Mr. Thomson has issued a series of directions, with the sanction of the Colonial Secretary, embodying the results of his more matured experiences, relative especially to the culture of the *C. succirubra*, for 15,000 plants of which species land is now being prepared in the Government plantations. This species, together with the *C. Calisaya*, has shown itself to be best adapted to the sites available in the island. The best range of elevation is found to be from 3000 to 4500 feet. In some of the damper parts of the Blue Mountain and St. Andrew's ranges that have not been at present denuded of their natural forest, the cultivation may be carried on at an altitude of 2500 feet. Mr. Thomson says, however, that the plant —and we believe he speaks mainly of the *C. succirubra*—will grow at a less elevation, but the yield of bark, and consequently quinine, is small. The mean annual temperature of any given locality is the best test of the eligibility of any site; it should be about 68° or 70° F. Dr. Hooker has advised that every species should be given a chance of thriving; for this reason, that the results obtained in one country cannot be correctly regarded as a gauge of the productiveness of the same species in another country; and he instances the case of *C. Pahudiana*, as failing in some climates, but producing in India a good yield of quinine; and a difference of a similar kind is noticed in the comparison of cinchona growth in America on the one and India on the other hand. In Jamaica, about 435 plants go to an acre at first. The young trees are planted just before the rainy season, in pits 30 inches wide by 15 deep, at 10 feet distances each way, the rows being planted alternately, "that is, the plants in every second row should be opposite vacancies of the first." In very hot weather a little artificial shade is needed, and this may be obtained by placing around the plants pegs sufficiently large to carry a few leafy branches. During the first year a height of three feet is reached, and a proportionate increase takes place subsequently. The yield of the bark in its natural habitat is about 5 per cent. as regards quinine. In India, as the result of culture, it has reached 8 and 10 per cent. From the prunings of the trees, moreover, a goodly amount of alkaloid is obtained; the part, too, of the "trunk that is

flayed is mossed over, and is soon replaced by renewed layers of bark of greater value than the preceding." Mr. Thomson speaks very hopefully of the estimated results as regards Jamaica; and in the circular to which we have before referred he thus puts the matter :—

"After the sixth or seventh year the yield is estimated not to fall short of one pound of bark per plant; the number of plants contained in an acre is, say 400, the bark of which valued at 2*s*. per lb. (a low price), gives £40 per acre per annum. At about the tenth year after planting, each intermediate tree is thinned out, about 200, in order to make room for the extension of those left. The 200 trees per acre thus cut down are each expected to yield 5 lbs. of bark, or £100. The annual production for the next few years of those remaining in the plantation, will give at least the aggregate of the previous 400 plants per acre, in consequence of the increasing size of the tree now about thirty feet in height, consequently the yield must be largely augmented. Each tree, on arriving at maturity some thirty years of age, gives 400 to 500 lbs. He further notices the advantage possessed by cinchonas over every other cultivation in the great difference between the market value of the produce, and the cost of production. The average market price of Peruvian bark, produced by the best species, may at present be estimated at five or six shillings per pound, while judging from the progress the plants have made in Jamaica, the cost of production of this quantity of bark cannot possibly exceed threepence."

The Government experiment has been so successful, and there would seem to be no possible doubt in this respect, that it will be a matter of surprise if the owners of land in Jamaica do not take the matter up, and work it to their own decided advantage. Plenty of young plants are now obtainable. It is to be hoped, too, that the executive will do their utmost to make cinchona one of the important products of the island. In England the course of events will be watched with anxiety.

ON THE VEGETABLE PRODUCTS USED BY THE NORTH-WEST AMERICAN INDIANS AS FOOD AND MEDICINE, IN THE ARTS, AND IN SUPERSTITIOUS RITES.

BY ROBERT BROWN, F.R.G.S., ETC.

(*Concluded from p.* 94.)

2. *In the Arts and Domestic Economy.*—First I should rank the tree I have before spoken of,*—"cedar" (*Thuja gigantea*, Nutt.), of which the Indians make many articles for domestic use; for instance, lodges, canoes, salmon-weirs, fishing-poles, etc., are made of the wood; "tow," ropes, blankets, mats, cloaks, etc., of the bark; of its tough twigs, withes to sew the canoes together; and Mr. G. M. Sproat seems even to think that it has had a powerful influence in forming the present and past habits of the race who use it so extensively.† Though the canoes of the natives are chiefly built of this wood, in other parts of the country where it is not found "cotton-wood" (*Salix Sconleriana*, Hook.) is used, and the rude "dug outs" of the Indians in Southern Oregon and California are made of the trunk of *Pinus ponderosa*. There is no birch in North-west America which could produce bark to make these beautiful crafts of, as on the eastern side of the Rocky Mountains. The bark of the white pine (*P. monticola*) is in like manner used for weaving blankets and cloaks. The maple (*Acer macro-*

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* Trans. Bot. Soc. Edin., May, 1868.

† Trans. Ethnol. Soc. Lond. 1866–1867, and 'Scenes and Studies of Savage Life.'

phyllum) is used for making paddles; hence, the Cowschans call it *kammalcelp* or paddle-wood. The vine maple (*Acer circinatum*, Pursh) in like manner, when it can be procured, is used for making bowls, and *Pinus monticola*, for spoons. The yellow cypress (*Cupressus Nutkaensis*, Lamb. = *Thuiopsis borealis*, Fisch.) is also among the Tsimpsheans used for that purpose, and for making boxes, the sides and bottoms of which are hollowed out of one piece. The roots of *Abies Menziesii*, Dougl., are used for making hats. I have seen a pack of cards ingeniously imitated on the barks of *Pinus monticola* and *Thuja gigantea* for gambling purposes. The gambling disks and polished sticks used by many tribes are generally made of *Acer macrophyllum* and *Cupressus Nutkaensis*. Yew (*Taxus brevifolia*, Nutt. = *T. Lindleyana*, Murr.) is often called in various languages "fighting wood," being used to make bows from. Much of this yew grows near Mount Shasta, in California, and among the Oregon Indians a bow of "Shasta yew" is as much prized as in Europe used to be a "coat of Milan steel," or "a Toledo blade." The arrows are made of cedar and various species of reeds, though north, the former is almost universally used. They have, I may mention, no arrow poison, but I have known some of the California Indians get a rattlesnake (*Crotalus lucifer*, Baird), and irritate it until it had struck repeatedly into the liver of some animal, impregnating it with its virus; they would then dip their arrows into this poisoned mass. All wood is used for fuel, but principally *Abies Douglasii*, Lindl., because it is most common, the branches of which are, in common with other trees, put into a canoe when it is leaking to keep the loads, or the paddlers from the water. At their great winter feasts bark is often used as fuel, it affording a stronger heat. *Pinus contorta*, Dougl., from being full of resin, is used as a torch by the Indians in salmon spearing at night, and at their feasts and dances. The leaves of *Philadelphus Gordonianus*, L., and *P. Lewisii*, Pursh, are used by the natives as a substitute for soap. The amole (*Chlorogalum pomeridianum*, Kunth), or "soap plant," has a bulbous root, which, when rubbed, makes a lather like soap, and was much used for washing by the Indians and native Californians, prior to the American possession of the country. It is also used, among other things, for making mats for saddlecloths. In California the aborigines make hats and vessels from a grass known as the "wire grass," and coarse mats of *Scirpus lacustris*, and other rushes. Bottles are, as I have mentioned in a former paper,* made of the bulbous stem of *Macrocystis pyrifera*, Ag. The textile plants of the Indians are few, the bark of *Thuja gigantea* supplying the place of most fibrous plants. They can extract a fibre from the stem of *Urtica gracilis*, Ait., the native nettle, and I saw a fishing-net made of it, which the owner, a Seshāāht Indian of Barclay Sound, Vancouver Island, valued at $100. Some of the Indians on the Columbia river used to make salmon-fishing nets of the twigs of *Cornus sericea*, L., and the more southern tribes still use the native flax (*Linum perenne*, L.) to make nets, twine, and ropes. Near the Klamath Lakes I saw it growing in such abundance as to suggest the idea of a cultivated field, and only recently the following extract appeared in the San Francisco (California) 'Bulletin' on the subject of the native "hemp," which doubtless refers to this, or an allied plant:—"A morning contemporary calls attention to the fact recently verified, that large quantities of native hemp grow in the valley of Humboldt river, in the State of Nevada, which is gathered by the Indians, who strip off the bark from the dried wood, and make from it very fine and strong nets. The fibre is said to be longer, finer, and stronger than common hemp; longer than flax, and more easily separated from the wood than either. It is said 1100 tons of the stripped fibre can be collected

* "Observations on the Medicinal and Economical Value of the *Oulachan*," etc.—Pharmaceutical Journal, June 1868.

in Humboldt Valley this season, and its prospective value as a cheap substitute for cultivated hemp, is suggested to our cordage and cotton factories. We may add to this interesting statement a fact within our own observation, that a native hemp is found in many parts of California, especially in the moist bottom of the Sacramento and San Joaquin rivers. The early Spanish colonists mention that it grew about the Tulare lakes, and was used by the Indians to make their fishing-nets. Its use for this purpose has always been common to the Indians of every part of the State. Some years ago, it was quite abundant along the Upper Sacramento. The fibre was long and fine, and easily stripped from the stalk, as it dried on the earth, and very light coloured. We have seen the Indians twist it into very fine and strong thread, with which they made not only small fish-nets, but nets twenty, thirty, and forty feet long, and nearly as wide, with which they caught wild geese, while feeding on the plains. Setting their stuffed geese as decoys, the nets are arranged flat, behind them, with wooden springs, and are sprung over the live geese when they alight, by concealed Indians. As many as twenty geese were sometimes caught in this way by a single haul. As they struggled to get loose, the Indians rushed forward with sticks and knocked them senseless when they poked their heads through the meshes. The nets required for this use were of course very strong. When a large net was made a number of Indians assembled to assist in its completion, the women being excluded from the sacred circle, though allowed to sit and gossip on the outside. It was enough for them that they were permitted to strip and dress the fibre, sometimes to pound the pinola (pine seeds) and acorns, and to carry in conical baskets, steadied on their backs, bound about their brows, the burdens imposed by their lords and masters. All the work of thread- and net-making was done with the fingers, assisted by sticks, something like modern crochet-needles; and this does not seem at all strange when it is remembered that the exquisite cotton fibres of the Hindoos are all made by manual appliances. In the same manner the Indians made from the native hemp some very fine, small nets, in which they bound their thick massy hair behind, in a like manner and with much the same effect as the fashionable *chignon* of our own day. These hair-nets were variously coloured, ornamented with beads, and pierced with feathers or long sticks, covered with snake skin. The despised Digger Indian of California may therefore claim to be the inventor of that most astonishing article of head-gear now in use among civilized women. We do not know if it is to be found anywhere in its old abundance; perhaps not, since so large a portion of the bottom lands, where it flourished so luxuriantly, but not exclusively, has been occupied for cultivation. If it can still be obtained in sufficient quantities, it would certainly be valuable for maufacturing purposes. The excellence of its fibre, for many inferior purposes at least, entitles this suggestion to consideration; and the fact that we have a native hemp of such fair quality warrants the inference, that the cultivated staple could be grown here to advantage. Possibly Indian labour on the valley reservations could be turned to profitable account in gathering and preparing the native production."*

3. *Medicine and Superstitious Rites.*—All medicine with the Indian is superstition, and all superstitions have a bearing more or less on medicine. Medicine is with them a mere piece of pagan empiricism. It is emphatically Napoleon's axiom, more trite than true,—putting what they know little about into a body about which they know still less. I would have you to guard, however,

* The writer of this extract, though styling this fibre-plant "hemp," apparently, for the most part, refers to *Linum perenne*, L., while curiously enough, both Pursh (Fl. Am. Sept. i. p. 210) and Douglas (Hooker, Fl. Bor. Am. i. p. 106) expressly state, though erroneously, that it is never used by the Indians of North-west America for economical purposes.

against the notion that the "medicine men" are equivalent to the "doctors,"—not so; they are mere sorcerers, and though practising medicine, in so far as sorcery and superstition are concerned, yet the healing art proper is in the hands of old women, who are supposed to be skilful that way, and large fees are sometimes exacted from their patients. Surgery they know little or nothing about. I know a very celebrated (and also a very brave) chief, who had rheumatism of the knee-joint. He diagnosed it to be caused by dirt getting in, and accordingly he absolutely proceeded to bore a hole through the patella, in order that he might get a stream of water in, to wash out the foul joint! For fractures they use, as we do, splints. On one occasion I was travelling in the mountains, my only companion an Indian boy, who, at a distance of several miles from the nearest abode of man, fell and snapped the femur; luckily it was not displaced. With the aid of cedar (*Thuja*) bark,—used as pasteboard splints,—and tearing the boy's shirt into bandages, I managed to reduce the fracture; I then raised the boy as well as I could on my back. In this manner the north-western surgeon and his patient took their way through forest and through swamps, over fallen trees, and crawling along cliffs, and fording swollen mountain-streams until we reached an Indian village, where I committed him to more skilful nurses. Aided by a good constitution and wonderful good luck, the boy recovered, and when last I visited that part of the country, I found him perfectly well, and that my fame had grown very great in the land. The liber of *Abies Mertensiana*, Lindl., is sometimes used as sticking-plaster. Their knowledge of the virtues of plants are, as I have said, merely empirical, but nevertheless they are used sometimes in acts "more honoured in the breach than in the observance." No crime is more common among Indian women than that of procuring abortion. They generally accomplish this by mechanical means, but some species of plants are also used, such as a species of orchid. From the plant, root, leaves, and stems is formed a decoction which is drunk by the women several times a day, until the effect is produced. It is said to be very effectual. The scrapings of a human skull are used in the same way, and some species of shells are looked on as what old Master Pomet would call "the sovereignest remedy on earth," for the same purpose. The infusion of the young cones of various species of pine and fir is thought to be very useful in preventing women bearing any children. The roots of a geranium are also used among the Lilloets in British Columbia, for the same purpose. Among the Pondereille Indians the rattles of a rattlesnake are thought to ease labour. I have heard much from the Hudson's Bay officers about the virtues of a species of *Valeriana* (*?*), called "kunko," by the M'Leod's Lake and other Takali tribes in British Columbia, as a specific in rheumatism. The berries of *Symphocarpus racemosus*, Mich., are used about Lilloet for colds. *Berberis aquifolium*, Pursh (the "Oregon grape"), the juice of a *Betula*, *Echinopanax horridum*, Sm., and an infusion of leaves of *Abies Douglasii*, or other fir, under the name of "spruce-tea," are all held in great estimation among the Indian and frontiers-men in venereal diseases.* A decoction of the roots of the *Berberis* has long been held in great esteem among the Indian tribes in the north, and is equally well known and valued among the backwoodsmen and frontier-miners, hunters, and others accustomed to mingle much among the native races. It is an excellent tonic, and there seem to be some good grounds for this universal appreciation of its properties as a curative in syphilitic and other venereal diseases, now becoming so rife among the Indians and on the frontier. I saw the roots of some species of *Umbelliferæ* (*Archangelica peregrina*, Nutt.?) employed with manifestly good effect as a poultice to inflammatory swellings. A decoction of *Achlys triphylla*, DC., is used as

* The roots of *Aralea nudicaulis* are said to be used by the Crees in venereal diseases. They also apply the bruised bark to recent wounds (Hook. l. c. *fide* Richardson, i. 274).

a remedy for pain in the breast. The leaves of *Psrolea physoides*, Dougl., are used as a poultice. The leaves of *Heuchera cylindrica*, Dougl., are applied in a bruised condition, to boils, by the Nisqually Indians. *Brunella vulgaris*, L., is mixed with grease and applied to swellings. The roots of *Trillium ovatum*, Pursh, are used as a poultice; and an infusion of the roots of *Polypodium vulgare*, L., being sweet, are used to be drunk with the decoction of *Berberis Aquifolium* formerly referred to. One would think that *Conium maculatum*, L., would be a dangerous thing to meddle with, yet the Indians of some tribes use an infusion of the plant, it is said with good effect, in diarrhœa. The juice, so classically known as a poison, is not used, and the infusion is mild, so that I never heard of any evil effects ensuing.

Like all superstitious people, they have "medicines" to produce mental effects, or to make them skilful in their employments. The notion is a very old one, and is not yet extinct in Europe, while in Africa and other savage countries it is one of the canons of superstition. Shakespeare referred to it in his day. Thus, in 'Henry IV.' (part 2) the following passage occurs:—

"I am bewitched with the rogue's company. If the rascal had not given me medicine to make me love him, I'll be hanged, it could not be else, I have drunk medicines."

A belief in "love philtres" is very common among the Indians. The Tsongeisth girls rub themselves with the roots of the orchid mentioned to gain the affection of their sweethearts. The roots of *Erythronium grandiflorum* and *Ranunculus* (*R. reptans*, L., *R. occidentalis*, Nutt., etc.) are also used with a view to the same end. The roots of a species of *Umbelliferæ* (*Conioselinum Fischeri*, Weim. and Grab.?) are also used in this superstition by the Tsongeisth. The roots are dried, and then pounded or mixed with some others, put on the garments of the person on whom it is desired to operate, or kept in the mouth of the person who is employing this piece of witchcraft. They have even a plant which is used to make a *man* cry! Indian girls look upon this as a great triumph, but I could never learn what plant produced this lachrymo-poient medicine. They have a medicine to help them to be skilful in killing whales, and even one to simulate virginity! I do not think that the northern Indians know anything of the action of poisons; though I have heard of some individual who had a box buried near his lodge which contained "medicine" with which he threatened to poison the whole family of an unwilling bride, if they did not yield to his marriage with her. The infusion of the roots of *Megarhiza Oregana*, Torr. and Gray, put into little ponds in the woods is said to be used to stupefy deer, which come down to drink, and thus fall an easier prey to the Indians. There used to be a scandal in San Francisco, that it formed the chief ingredient in "Stoughton's bitters!" Pine gum is continually chewed by the northern Indian women; to the use of it may be attributed their beautifully white teeth. The natives make no turpentine, but much is now manufactured in Oregon and California, and an experiment was made in Vancouver Island which promised success. The "poison oak" (*Rhus toxicodendron*, L.) grows abundantly in many parts of Southern Oregon and California. There are several species, but the present one is the most common, and as the effects of all the others are similar, these may be considered under its description. It thrives best on a moist soil, and in the shade. In a thicket in the shade, with other bushes, it sends up many thin stalks, eight or ten feet high, with large, luxuriant leaves at the top; in the shade the leaves are green. In the open ground, exposed to the sun, and without support from other bushes, the poison oak is a low poverty-stricken little shrub, with a few red leaves. If it can attach itself to an oak-tree, it becomes a parasitic vine, and attains a thickness, though very rarely, of four inches in the trunk, and climbs to a height of forty feet.*

* Hittel's 'Calif,' 103.

It affects the skin of most people in a very painful manner, and the inflammation speedily spreads from one part of the body to another. Some people are so affected that their faces could not be recognized, and others (like the writer of this paper) are not affected by it; but instances are not uncommon of persons who have supposed themselves proof against the poison, but have at last been affected. After having been once injured they are ever after very susceptible to the poison. Even passing to the leeward of a bush on a windy day, or through the smoke of a fire in which it is burning, will "bring the poison to the surface" again. In some parts of California cattle are there affected by what is known as the "milk sickness." On breaking a stem of the *Rhus* a milky fluid is exuded which is exceedingly poisonous, and if applied to the skin, will produce effects like that of nitrate of silver. A black welt is produced which, in a few hours, becomes sore, destroys the cuticle, which sloughs off, and upon healing leaves a circular cicatrice. So poisonous is it that it pollutes the air where it grows. Children, and even grown-up people, who are gathering berries, or otherwise approaching its vicinity, are often badly poisoned. Their faces are frequently swelled until their eyes are shut; the neck, hands, and arms covered with inflamed vesicles, the cuticle highly inflamed and not unfrequently constitutional symptoms are observed, resembling those of "milk sickness." The nostrils of cattle grazing amongst it are often covered with pustules. Indeed its effects are described as almost approaching the fabulous Upas-tree, which that "Puck of Commentators," George Stevens, invented, and Erasmus Darwin handed down to posterity in the stately verses of the 'Botanic Garden.' Though well known for a long period (there is a paper on it in the 'Philosophical Transactions' of last century) it has never yet been thoroughly investigated.* The Indians seem rarely to be troubled by it, and the native Californians look upon an infusion of *Grindelia hirsuta*, Hook. and Arn., a composite plant, as a cure for its noxious effects. There may be said to be no rattlesnakes west of the Cascade Mountains, at least, north of the Columbia river, though they are sufficiently abundant to the eastward of that range, as far north as Frazer river, where I have known several Indians to be bit by them. Their usual plan is to brand the wound, having previously tied a ligature between the heart and the bite, or to push the wounded limb among mud immediately on receiving the poison. It is said that by this means the poison is washed off, and that the person often escapes death. The only effectual cure I have found is drinking immoderately of spirits, until, indeed, no more can be drunk. I know a gentleman who was bit, once by the well-known copperhead snake of the Western States (Missouri), and twice by the rattlesnake in Oregon, and recovered by this treatment. The country people have innumerable specifics for their bites, but I cannot learn that any of them are reliable. The Indians of Central America have several remedies from the vegetable world, and all the tribes north to British Columbia are said to possess some herb or other, but I have generally found them to adopt the treatment I have given above. In California, the leaves of *Daucus pusillus*, Mich., the *yerba de la vibora*, or "rattlesnake herb" of the Spaniards, are said to be a cure for the bite.†

* *Vide* Dr. Isaac Mendhall, in 'Cincinnati (U. S.) Lancet and Observer,' March, 1861; Chase in *Ibid.*, May, 1861; article in 'Chicago Medical Journal,' June and July, 1861; Canfield, in 'Edinburgh Botanical Society's Transactions,' 1859; and Bigelow, 'Medical Botany.'

† Pigs have a peculiar antipathy to snakes of every description, and particularly to the rattlesnake. Instantly on seeing it the pig will rush towards the venomous reptile, place its foot on its head, and most adroitly kill it. A few pigs will soon clear a district of snakes. At one time the Dalles of the Columbia was perfectly infested by these disagreeable neighbours. They would even enter the houses and crawl under the beds. Since the introduction of pigs, consequent on the country being more settled up, not one can be seen for miles around. The pigs are said not to be affected by the poison. The snakes likewise seem to dread the pigs, and this is so well known to the Indian women that they will often beg a piece of the skin to wrap round their ankles, when gathering berries in the bush, in order to protect them from snakes.

I will conclude these stray notes by an account of the extraordinary effects of the roots of *Clematis Douglasii*, Hook., on exhausted horses. It was at a horse-racing of the Nez Percez Indians that it was witnessed. One horse was seen which had fallen down. The Indian put a piece of the root (the outer coat scraped off) into the nostril of the animal. The effect was surprising. The creature sprang up under convulsions, and was then brought to the river and bathed, and "I found several which had been so treated, afterwards grazing with the herd apparently without having sustained any injury."*

What I said in the introduction to these fragmentary notes, I may now repeat in conclusion, viz. that they are by no means complete, especially in the latter section. Often you see vegetable products in possession of the Indians, when either through want of opportunity, season, or inclination on the part of the possessor, it is impossible, even should the plant yielding grow at that season and in that part of country, to discover the botanical name of it, or obtain a specimen. Again, an Indian sorcerer, doctor, or "wise woman" will search for a whole day for the proper plant, and however ridiculous we may look upon its virtue, they think otherwise, and naturally are in no way willing to ventilate the secrets by which they earn large fees.† The present memoranda may, however, serve as examples of the superstitions of a fast dying off race.

ON THE PRESENT STATE OF PHARMACY IN IRELAND.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—I read with no little astonishment Mr. Monaghan's letter in the July number of your deservedly popular Journal. He has misrepresented the facts, and as a result arrived at the most erroneous conclusions.

The law, coming into force before the Pharmaceutical Society was in existence, very properly confined the dispensing of prescriptions to apothecaries. Doubtless, had there been Pharmaceutical Chemists at that time, their claims would have been duly recognized. Persons are not by law prevented selling medicines.

The Apothecaries' Society has never rigorously enforced the powers vested in it. I know several unqualified persons keeping apothecaries' establishments, and several apothecaries who keep apprentices that have not passed any preliminary examination. Mr. Monaghan seems to think that knowing by rote the "national Pharmacopœia" is enough to constitute any person a dispenser of medicine. A deal must be learned before the Pharmacopœia can be thoroughly understood, and a great deal, more especially of a practical nature after it is understood, before a man can be said to be fit to compound medicine. An Irish apothecary is justly something more than a "pure pharmacien." Surely, the course required for the apothecaries' licence entitles the possessor of it to practise medicine, If not, what course of study does? The licence of the Apothecaries' Society is one of the most difficult to obtain in Ireland; and will always be recognized as such by unprejudiced medical gentlemen, notwithstanding the jeers of some physicians and surgeons, more especially those who, being unable (from the amount of learning they possess) to graduate in their own kingdom, take a trip to North Britain, pay £25, have a *special* examination, and return full fledged surgeons and

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* Geyer, Hooker's Journ. Bot., vol. vi. p. 66.

† I have known one woman get five blankets, valued at £2. 10*s*., for allaying a very simple swelling.

physicians,—or, as some of them most unwarrantably dub themselves, *doctors*. One of them some time ago informed me there was no water of any kind in proof spirit. It was rectified spirit, save that it had a sp. gr. of 1000. He ridiculed the idea of water being in it. When shown the Pharmacopœia he hummed, hawed, and changed the conversation *instanter*. Another laughed at the name "cerebro-spinal fluid," until shown it in a work on surgery. Another specimen of this species of humanity, who cut down apothecaries behind their backs, and are as silent as mutes on all professional matters before them, ordered me to get some of the tinct. ferri perchloridi from the druggist, as he had a decided objection to use tinct. ferri mur. Supposing, as Mr. Monaghan does, that a L.A.H. and an M.D. were the only medical men in a small town, the gentleman holding the qualification M.D. might legally dispense his own prescriptions, provided his name was on the 'Medical Register.' On the same conditions any other medical man might do the same. A pharmaceutical chemist is emphatically not more generally competent to dispense than an apothecary of the Irish Hall. Mr. Monaghan made the allegation without proof of any kind. Quantity is not quality; and because there are fewer dispensers in Ireland (the population of which is about five millions) and fewer needed than in England, whose population is four times as great, it does not follow that pharmacy is a whit more backward here than in England. Mr. Monaghan has described a state of things existing solely in his imagination, and we may all rest assured that as long as there are such vigilant aspirants in medicine as Mr. T. J. Monaghan, the ridiculous idea of apothecaries usurping a monopoly of prescribing will never be a *fait accompli*. I think pharmaceutical chemists should have, and I hope soon to see them enjoying, the same privileges in England, Ireland, and Scotland. Let them stand on their own merits, and they will overcome all obstacles. Let truth and equity, not misrepresentation and prejudice, be the basis of all their arguments and actions in every question which may affect their interests, and they will assuredly triumph.

I remain, Gentlemen, yours respectfully,

M. D. Crofton.

[We have omitted the postscript and certain passages which have no bearing on the point in dispute.—Ed. Ph. J.]

AN ASSISTANT'S PLEA.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Dear Sir,—Would you allow me, through the medium of your valuable Journal, to place before your readers the present condition of the assistant chemist and druggist in this part of the kingdom, that it may be seen how impossible it is for him to qualify himself for the examinations rendered compulsory by the passing of the new Pharmacy Act?

He has been apprenticed at the age of fourteen or fifteen to a chemist and druggist for a period of five years, and his ordinary working hours are from 7.30 A.M. to 10 P.M., and this may include Sunday likewise in some cases; however, he may have every alternate Sunday to himself.

All this time he is kept hard at the mere mechanical part of his profession, without the least encouragement, in most instances, to attain any theoretical knowledge of it. Now, where is the time to be found to enable him to gain that knowledge necessary for the examination under the Pharmacy Act? Lately an Association of Assistants and Apprentices was formed in Aberdeen,

having for its object the scientific and literary improvement of its members, and, if possible, for the formation of classes for teaching those subjects required at the examinations. To enable this to be carried out, it was resolved to petition the masters for shorter hours, and, although a few seemed willing to accede to the request, the usual want of harmony and union amongst the masters prevented this, and it was refused.

This, therefore, was a severe blow to the Association, and, had it not been for the enthusiasm of the members, and an earnest desire amongst many for self-improvement, it would have succumbed.

It still exists, however, but under so many difficulties that it seems almost impossible it could succeed. It is entirely self-supporting, pays for a place of meeting, and cannot form a meeting earlier than ten o'clock. Yet these meetings are formed by assistants from almost every shop in the city, and the attendance is generally good.

My object in writing these lines to you, therefore, is to show that, however strong the will, there may be so many obstacles put in the way of improvement, that the assistant can hardly find it possible to qualify himself for the examinations now rendered compulsory.

Were the assistants to employ and support a teacher, would it be too great a sacrifice on the part of the masters to close an hour or two earlier, that their assistants might have time to attend an evening class?

I remain, yours, etc.,

AN ASSISTANT.

Aberdeen, Aug. 11.

[We cordially second this appeal to masters, and we feel confident the spirit evinced by the writer will carry him up to and through the required examination.—ED. PH. J.]

NEW PHARMACY ACT.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—The Pharmacy Bill is now an accomplished fact, but though it is better to shut the door before the horse is stolen, I think pharmaceutists are fairly entitled to ask for the recognition due to the founders of a National Society.

Our position is this: unexamined members are those who lent their assistance in a time of struggle and uncertainty; our younger brethren are those who have burnt the midnight oil and risen in the chilly dawn, given their few leisure hours, and sacrificed time and money to gain a recognized rank.

Both classes are surely entitled to some credit and reward; but what do we see?

"A." is a pharmaceutical chemist, and has paid his ten guinea fee, besides devoting his money and time to earnest study. He goes into business, and, writing up "pharmaceutist," does not adorn his establishment with the diploma of membership.

"B." has spent his spare time and money in bed and in pleasure, but thinks he may as well avail himself of the Act, and, accordingly, pays his few pounds, placards himself as M. P. S., and displays the elaborate diploma.

There is little question that the public would regard the "member" as the more distinguished man.

To remedy this palpable inconsistency and pecuniary wrong, I would urge upon my fellow pharmaceutists to represent to the Council the equity of

granting (if in their power) the title of "Fellow" to the examined, or as a pecuniary compensation to admit them as life members, either freely or at a reduced rate.

Yours faithfully,

"FIAT JUSTITIA RUAT CŒLUM."

[The Council have no power to create a new title.—ED. PH. J.]

THE DECIMAL SYSTEM.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—As our members are a commercial body of men, I was interested to read Mr. Ernest Agnew's able reply on the above subject, in your notes to correspondents.

The indifference of Englishmen to decimal currency arises from the difficulty of the knotty question, whether the *penny* or the *florin* is to give way.

It is well known that the English currency is not incompatible with the decimal system; and, if ever it is adopted, it must be decided on the rough principle by which Columbus is said to have settled the egg controversy.

I confess that it appears to me, that the *penny* must always be retained. If ever adopted, the difficulty of calculating *interest* would be done away by the decimal system.

I am, Gentlemen, etc.

J. LEAY.

Chilcompton, Bath, August 5th, 1868.

MEASURES OF LENGTH AND WEIGHT.

The Standards Commission have agreed to the following first report:—

"1. The Commission appointed by your Majesty under date of the 9th of May, 1867 for inquiry into the condition of the Exchequer Standards, and for other purposes, included six members of the present Commission, cited by name in the body of the warrant of the 4th day of May, 1868, together with William Earl of Rosse and John Baron Wrottesley. Upon the decease of those noblemen your Majesty was pleased to revoke the warrant of the 9th day of May, 1867, and by warrant of the 4th day of May, 1868, to reappoint the six surviving members nominated in the former warrant, with the addition of Reginald Charles Edward Baron Colchester and the Right Hon. Stephen Cave; the duties of the Commission being defined in the same terms as in the former warrant. We have therefore considered that the new Commission is deemed to be in reality a continuation of the former Commission; and the details of the report now to be submitted apply to the proceedings of both Commissions.

"2. We have held six meetings, and we have been in constant communication with the Warden of the Standards, from whom we have received several elaborate and important statements, which, when more complete, we propose to submit to your Majesty. The materials of the following sections of this report are derived in great measure from those statements.

"3. On the condition of the official standards we have to report:—first, that the Warden of the Standards has, by use of the most accurate balances, and with the best modern appliances and methods, compared the official standards of avoirdupois weight with the gilt bronze standards, whose authenticity is derived from the imperial standard by comparisons made by Professor Miller at the time of construction of the imperial standard. And the result is that the official standards of avoirdupois weight have been found to be considerably in error, the deficiency of weight in the official standard of

56 lb. being nearly 12 grains. In view of the magnitude of this error, and of the consequent error in the practice of the Standards Department of the Exchequer for many years, as regards the verification of local standards, it became necessary for the Commission to decide on the course to be adopted in future. The Commission unanimously affirmed the following principle:—

"'That it is the business of a Standards Department to compare local standards with the imperial standards; the official standards being considered only as intermediaries, brought into use for the safety of the imperial standards and for general convenience.'

"As a temporary arrangement, small supplemental weights have been prepared under the immediate superintendence of the Warden of the Standards, by use of which, in conjunction with the defective official standards, the just weights are represented. But the Commission propose without delay to prepare new avoirdupois standards, correct in weight, and with improvements as to metal and as to form suggested by the latest experience.

"4. Secondly, the Warden of the Standards has compared the official standards of troy weight and of bullion weight with the primary platinum troy pound from which, in fact, the imperial standard of the avoirdupois pound was derived. The differences discovered are so small as to require no mechanical correction, and the state of these official standards may be considered generally satisfactory.

"5. Thirdly, arrangements are in progress for comparisons with their proper bases of the official standards of length, of capacity (for which the balance-beam originally constructed by Captain Kater for the same purpose will be used), and of gas measure.

"Of all the existing official standards a list will be given in an appendix to be hereafter prepared.

"6. In regard to additions that may be required to the existing official standards, we submit that the following are desirable:—

"In weights of the smaller class:—Standards of decimal series of grain weights; and standards of the weights of the half-sovereign, and of decimal series of the sovereign (gold coins), showing their full legal weight; together with single standards, showing the smallest weight sanctioned in legal tolerance.

"In measures of length:—Standards of the chain of 22 yards divided into links; the measure of 100 feet, divided into feet; the measure of 10 feet with decimal and duodenary subdivisions; the measures of one yard, of two feet, and of one foot, with binary and other subdivisions.

"In measures of capacity:—Standards of one-sixth gallon and one-twelfth gallon, as measures of the wine-bottle and half wine-bottle; and standards of four, two, and one fluid avoirdupois ounces (of distilled water).

"A measure (with proper comparing apparatus) of one yard, bearing various subdivisions, has been provided; which, when verified as to its whole length and its divisions by the Warden of the Standards, might with propriety be used as an official standard, for accurate comparison of subdivided measures.

"7. The Commission, observing the extraordinary attention now given to the metric system of weights and measures, and remarking that an Act was passed in 1864 to render permissive the use of the metric system, consider it highly desirable that complete representatives of that system should be lodged in the Standards Office. By the courtesy of the President and Council of the Royal Society, the Commission have been enabled to use the best copies of the French standard metre existing in this country for laying down the exact measure of the metre. The Standards Office possesses a most accurate copy of the kilogramme, verified by Professor Miller, and transferred, with the sanction of the Lords Commissioners of your Majesty's Treasury, from the Royal Observatory of Greenwich to the Standards Department. And the Commission have taken steps for procuring complete series of the weights and capacity-measures of the metrical system.

"8. The comparing apparatus of every kind for making the official and other standards available in the most accurate way for public purposes, and the mode of impressing the official certificate, are under revision. Lists of the balances and other comparing apparatus will be given hereafter in an appendix.

"9. The Commission are of opinion that standards of every weight and measure represented by the material standards now in the Standards Office ought still to be main-

ained in the office. The Commission have already indicated that the existing series of official standards of avoirdupois weight ought to cease to be secondary legal standards as soon as others shall be substituted for them. So far as the examination by the Warden of the Standards has yet advanced, no other of the existing official standards ought necessarily to be discarded.

"10. The Warden of the Standards is engaged in collecting evidence, both from his own examination of official and local standards, and from the representations of local inspectors and others, as to the amounts of error which ought to be tolerated in comparisons of different classes. A scale has been formed for provisional use in the department, with the sanction of the Commission, but it is considered by them as open to further correction.

"11. The great and important duty of considering how the Standards Department may be made most efficient has engaged the earnest attention of the Commissioners. As regards the principal object of the department, namely, the ensuring that no weights and measures, except those possessing reasonable and uniform accuracy, shall be in use for public sales throughout the kingdom, the Commission considered it as the first necessary step to demand information of various kinds from the local inspectors; and a series of inquiries, approved by the Commission, was issued by the Warden of the Standards to all the authorized local inspectors. The returns to these inquiries have been received, and, by a process of great labour, conducted under the immediate superintendence of the Warden of the Standards; abstracts of a large portion of the returns have been prepared, and the work is still advancing. Until this operation has been completed, the Commission are scarcely in a state to lay before your Majesty any recommendations upon the important points which will probably be brought to notice.

"12. The Commission have recognized with great satisfaction the effect of the enactment in the Act 29th and 30th of Victoria, cap. 82, sec. 11, removing the limitations by which the utility of the Standards Office was formerly confined to means of ensuring ordinary accuracy in public sales, and tending to make the office available for scientific researches. It has appeared to them desirable for carrying out this intention that the office should be made a place of deposit of all standards of antiquarian or historical interest, of standards of accurate character which have been made available for the formation of the Imperial standards, and of standards which have been used as bases of the most important geodetic measures, pendulum measures, and other scientific measures. With this view, and on the application of the Astronomer Royal, chairman of the Commission, the Lords Commissioners of your Majesty's Treasury, have given their assent to the deposit in the Standards Office of various valuable standards and apparatus which had been collected at the Royal Observatory; the Lords Commissioners of the Admiralty, in like manner, have sanctioned the transfer of the Cape of Good Hope geodetic standard; and the Secretary of State for India in Council has also sanctioned the transfer of the Indian standard. These standards and apparatus accordingly have been lodged in the Standards Office. The Commission trust that sanction will also be given for the transfer from the Royal Mint of a large collection of foreign standard weights collected about fifty years past, and possessing a valuable though antiquarian character.

"13. It will be remarked that the Standards Department has long been in possession of many antiquarian standards, and of standards of accurate construction which have borne historically an important part in the formation of the modern exact standards. The Commission regret to state that two weights of the latter class, which had been transmitted under proper sanction for exhibition in Paris, have in some unexplained way received serious injury. The Commission are, however, satisfied that there remains abundant direct evidence for the constructive history of the modern standards, although they cannot but feel the importance of carefully preserving every representative (whether original or derived) of the national weights and measures constructed at the time of a great reform in our system of standards, which can serve to give collateral evidence.

"14. For giving further effect to the enactment above cited the Commission desire to point out that a great step would be made in the promotion of general scientific accuracy by giving to men of science, artists employed in the manufacture of scientific instruments, and others (on payment of a proper fee), the results of comparison of their own standards with the standards of most accurate character in the Standards Office. As standards of this class would not be available for the official purposes of inspectors of standards, and as there is consequently no necessity for limiting the class of standards

So compared to the recognized scale of British standards, the Commission express their hope that the sanction for which they ask may be extended to include every kind of standard in the Standards Office, and especially standards on the metric system, the want of which is already experienced by manufacturers of standards, men of science, and mechanical engineers.

"15. As an important matter for maintaining the high character of the Standards Office, the Commission have remarked with pleasure the efforts made by the Warden of the Standards for the formation of a Standards Library. Many papers have been presented by the Presidents and Councils of the Royal Society and the Royal Astronomical Society; others by the Superintendents of the Standards Departments of France, Prussia, and the United States of North America. The translations of these, and compilations from them, made by the Warden of Standards, to be annexed as appendix to a subsequent report, will probably be found to convey the most valuable information which this country yet possesses on the standard systems of those countries generally, and particularly on the regulations and working of the metric system. Other official and historical documents have been derived from other sources.

"16. It will be evident from the premises that the internal business of the Standards Office has greatly increased. In addition to the large demands for the services of clerks in the formation of the laborious abstracts to which we have alluded, and in the extension of correspondence domestic and foreign, a great amount of labour, both mechanical and clerical, has been thrown upon the office by the requirement of the reverification of the local and official standards at stated intervals. Applications for increased personal assistance in the office, made by the Warden of Standards, and supported by the recommendation of the Commission, have been favourably received by the Board of Trade.

"17. In a late discussion in the House of Commons on the question of introducing into this country the metric system, the Vice-President of the Board of Trade, speaking for your Majesty's Government, stated, as a reason for taking no immediate steps, that the Government desired to wait until they should have received the opinion of this Commission on the working of the metric system, and on the probable effect of attempting to introduce it in this country. The members of the Commission have not yet had time sufficiently to examine the papers bearing on this subject, and the Commission are therefore unable at present to express an opinion. The Commission, however, are aware of the great importance of the question, and will not fail to give to it their early and careful attention.

"All which we humbly submit to your Majesty.

"G. B. Airy, Chairman.
"Colchester.
"Stephen Cave.
"John George Shaw Lefevre.
"Edward Sabine.
"Thomas Graham.
"W. H. Miller.
"H. W. Chisholm.

"7, *Old Palace Yard, July* 24, 1868."

TREATMENT OF POST-NASAL CATARRH.

Dr. Horace Dobell, Senior Physician to the Royal Hospital for Diseases of the Chest, sends us a note on this subject:—"In 1854, I read to the Observation Society of St. Bartholomew's Hospital a paper on a common complaint, to which I gave the name 'Post-nasal catarrh.' So far as I am aware, it has not previously been described as a distinct affection, although, doubtless, it must have long been familiar to medical men. Subsequent experience having fully confirmed the accuracy of the account of the disease which I drew up in 1854, I published an abstract of my original paper in an appendix to my work 'On Winter Cough' in 1866, to which I may refer those who are interested in the subject." ('Lancet,' June 9th, 1866.)

"In that abstract I purposely omitted the treatment of the disease, because I had not then quite decided which was the best of the many plans I had tried. I propose now, in as few words as possible, to supply the omission referred to. Although at first sight

a very trifling complaint, post-nasal catarrh is unquestionably very troublesome to cure, and is very apt to return. The difficulty is mainly due (1) to the awkwardness of applying topical remedies to the parts principally affected; (2) to the almost invariable existence of a diathetic cause; and (3) to the length of time which the complaint has usually existed before the patient comes under treatment. As in all affections of the naso-pulmonary mucous membrane, the first point is to make out the nature of the existing morbid constitutional state, and to apply appropriate diathetic treatment for its removal. But, unfortunately, this alone will not be efficient, for the local affection will seldom yield without some topical applications; and it is in settling the form of this local treatment that I have found the greatest trouble. After trying a great number of applications in the form of spray, injection, gargle, lotion, inhalation, snuff, and lozenge, I have come to the conclusion that the best for the majority of cases is the combination of a MEDICATED SNUFF and a MEDICATED LOZENGE.

"The snuff consisting of camphor, tannic acid, white sugar, and high-dried Welsh snuff, of each ʒj.

"The lozenge consisting of camphor, gr. ij; guaiacum, gr. j; tannic acid, gr. ½; hydrochlorate of morphia, gr. $\frac{1}{36}$; tincture of benzoin, ♏ ij; white sugar, gr. xix; acacia gum, gr. ij.

"From three to four lozenges should be taken each day, one of which should be taken at bed-time, and one on waking in the morning. The snuff should be used once in the morning, once in the evening, and once or twice in the day, and it is best applied by means of a little elastic tube, one end of which is charged with snuff, and pushed into the nostril, the other end being put into the mouth, and the snuff blown up the nose with a sharp puff. I ought to add that the snuff must be discontinued should a fresh attack of nasal catarrh happen to set in, but its use must be resumed on the subsidence of inflammatory symptoms. The lozenges should be continued throughout."—*The Practitioner, August*, 1868.

SUICIDE BY TINCTURE OF ACONITE.

On Saturday, August 15th, an inquest was held by Dr. Lankester at Middlesex Hospital respecting the death of John Heddington, aged 20, who was employed at the General Apothecaries' Company, Berners Street, as porter.

Dr. Andrew Stephens, resident medical officer at Middlesex Hospital, deposed to the deceased being brought to that institution about six o'clock on Tuesday evening last. He was told that aconite had been taken. His pulse was subdued, he had a difficulty in swallowing, his speech was affected, and his memory was partially gone. He was sensible, but did not tell what he had taken. Emetics had been administered previously to the deceased being brought to the hospital, but the stomach-pump was there used, and the fluid obtained was tried on a dog, and returned the symptoms of poisoning by aconite. It was also tested on the tip of the tongue, undoubtedly giving the presence of that irritant poison. Death ensued about two hours after admission to the hospital. The examination after death proved that death was due to poisoning by aconite.

In reply to the coroner, Dr. Stephens said it was "Fleming's Tincture of Aconite." It appeared from the evidence that the deceased was seen to pour the liquid from a two-gallon jar kept in the laboratory. He was a sober, steady young man, and was about to be married. The motive for the act did not transpire.

The coroner asked Dr. Stephens if he was aware of any efficacious antidote for vegetable poisons. Dr. Stephens replied, "If powdered animal charcoal in water were early administered, after an emetic or the use of the stomach-pump, it would be very effective."

A verdict of "Suicide under temporary insanity" was accorded.

POISONING BY BARYTA.

On Friday, August 21st, Mr. C. G. Lewis, the coroner for Essex, resumed and concluded an inquiry at the Railway Hotel, Martin Street, Stratford, into the cir-

cumstances of the death of Thomas Hicks, who lived at 82, Angel Lane, Stratford, and who died on Sunday, the 26th of July. The deceased had been for nearly thirty years in the service of Messrs. Volckman and Sons, the confectioners. His landlady, Mrs. Smart, procured, as she thought, some milk of sulphur from Mrs. Hills', a chemist's shop in High Street, Stratford, some of which was given to the deceased, who was suffering from rheumatism. In the early part of the Sunday he was found to be suffering from the effects of some irritant poison, which corresponded with the effect of nitrate of baryta on the human frame, and from which he undoubtedly died. As he had lived in the house of a Mrs. Smart, whose daughter was jointly entitled with the deceased to a considerable sum of money, suspicion arose as to the cause of death, considering its suddenness and his previous good health. Mrs. Hills, who had previously stated that she had no baryta in her shop, was then recalled, and persisted in her averment. After a lengthened deliberation, the following special verdict was returned:—"That the deceased William Hicks died from the effects of baryta, accidentally sold by Mrs. Hills to Mrs. Smart as flour of sulphur. The jury are unanimously of opinion that Mrs. Smart is entirely exonerated from all blame, and that gross carelessness existed on the part of Mrs. Hills. The jury also regret that Dr. Hamilton was not more prompt in his attendance." The coroner very severely admonished Mrs. Hills with respect to the statements she had made as to her possession of green fire, or baryta, in any form, and expressed his firm conviction of her unfitness to keep a chemist's shop.

SUSPECTED DEATH FROM LAUDANUM.

An inquest was held, on July 10th, by the Leeds borough coroner, on the death of James Baines, forty-three years of age, who died, as was supposed, from the effects of a dose of laudanum, which his wife had purchased and administered to him as tincture of rhubarb. It appears that he was suffering from diarrhœa, but, instead of taking medicine, he ate a great quantity of fruit pie and green peas. His wife went to the shop of a general dealer, and obtained a quantity of what she supposed to be tincture of rhubarb, and gave the whole dose, two-pennyworth, to the deceased at once: he brought it up almost immediately. The following day he became worse, and a doctor was sent for, but he died soon after his arrival. A *post mortem* examination was made, from which it was concluded that death was caused by diarrhœa, accelerated by an enfeebled heart. Mrs. Hobson, whose husband keeps the shop at which Mrs. Baines purchased the supposed tincture of rhubarb, stated that she had on the 1st July received a bottle, which was labelled as, and which she supposed to be, tincture of rhubarb, from the shop of Messrs. Garland and Co. She sold a portion to a neighbour called Mrs. Radcliffe, who mixed it with water, and gave it to her husband to drink. He took it, but had experienced no injurious effects. Then she sold a portion to Mrs. Barnes, the wife of the deceased, and on Thursday she parted with an ounce to the servant of Mr. Haigh, a timekeeper at Messrs. Tetley's brewery. The mixture was sent back, Mrs. Haigh stating that it appeared very like laudanum; but she produced the bottle, which was plainly marked tincture of rhubarb. This satisfied Mrs. Haigh, and the medicine was administered, but she felt nervous as to its being correct, and hastened to a chemist with the bottle, and he told her that it was laudanum. Upon this she went back, and told Mrs. Haigh that that which had been given her as tincture of rhubarb was in reality poison, and that a doctor had better be obtained at once. That was done, and Mr. Haigh recovered.—A man called Thomas Wood was then examined, and stated that he was a porter in the employment of Mr. Garland, chemist, of North Street. It was not his duty to make up drugs, but on the 1st of July, in the absence of the assistant, he took a quantity of liquid out of a stone bottle, placed it in another, labelled it "tincture of rhubarb," and sent it to Mrs. Hobson. That mixture turned out to be laudanum. He had never thought of looking at the label of the stone bottle, which was marked "laudanum," and could not account for his having filled the small bottle without doing so.—In summing up the evidence to the jury, the coroner pointed out that it was apparent that the deceased had died from natural causes, but animadverted upon the gross carelessness shown by the witness in filling a bottle out of a jar, the label of which he

had not looked at; and observed that in a chemist's business, above all others, it was necessary that there should be the greatest caution used, as the consequences of a mistake might be very serious.—The jury returned a verdict of "Died from natural causes," and censured Wood for his carelessness.

BRISTOL AND CLIFTON CHEMISTS' ASSISTANTS' ASSOCIATION,

16, St. Augustine's Parade, Bristol.

Established October, 1867.

Officers:—*President*, Mr. F. Stevens; *Vice-President*, Mr. R. H. Swingburn; *Treasurer*, Mr. E. Organ; *Hon. Sec.*, Mr. H. J. Gibbs; *Committee*, Messrs. Day, Stewart, Thomas, Babb, and Presley.

Annual subscription (payable monthly), 6*s.*; entrance fee, 2*s.* 6*d.* The officers of the Association retire half-yearly, but are eligible for re-election. The rules and objects of the Association are published in a separate form, and may be obtained on meeting-nights, or forwarded on receipt of one stamp. Communications addressed to the Secretary, 16, St. Augustine's Parade, will receive attention. Members are earnestly desired to introduce suitable candidates for admission to the Society.

The Reading of Papers.—Third Session.—1868.

September 4, "Non-Officinal Preparations," Mr. Swingburn; Sept. 11, "Carbolic Acid," Mr. Stevens; Sept. 18, "The Pharmacy Bill," Mr. Robinson; Sept. 25, "Communication," Mr. Crow; October 2, "Since I have left you," Mr. Beynon; Oct. 9, "A Paper," Mr. Presley; Oct. 16, "Oxygen," Mr. Stewart; Oct. 23, "Iodine," Mr. Morgan; Oct. 30, "Geology of Bristol and Clifton," Mr. Glossop; November 6, "Shop Fittings," Mr. Thomas; Nov. 13, "Photography," Mr. Babb; Nov. 20, "Calcium," Mr. Organ; Nov. 27, "Aloes," Mr. Stubbs; December 4, "A Paper," Mr. Day; Dec. 11, "The Extracts of the Pharmacopœia," Mr. Cracknell; Dec. 18, "General Meeting." The chair will be taken at nine o'clock punctually.

TO CORRESPONDENTS.

Persons having seceded from the Society may be restored to their former status on payment of arrears of subscription and the registration fee of the current year.

Those who were Associates before the 1st of July, 1842, are privileged (as Founders of the Society) to become Members without examination.

Poison Bottles.—A correspondent sends the following suggestions:—1st. The bottle should be of an uncommon shape, and I would suggest three-sided (triangular), as it is less used than any other. On each side it should have the word "poison" in raised letters, which might be felt as well as seen. As these bottles would be sold to brokers, etc., when empty, and would find their way into the hands of the poor, and often be presented for medicines, hair oil, etc., at the chemists', it should be the duty of all chemists to retain any such bottles, and to give or sell another one in place of it; and any chemist using this bottle for other purposes than for lotions, injections, or poisons should render himself liable to a fine. By keeping the poison bottle distinct, persons would generally be reminded by its shape of its dangerous contents.—2nd. The Label. Every bottle for lotions, etc., should have on a label with the words "Not to be taken—Poison," printed in bold type. This label should also be attached to the outside of the wrapper.—3rd. In all cases where deadly poisons are prescribed in quantity for a lotion, on account of distance from a surgeon or chemist, the lotion should be put up in two or more bottles, each sufficient for one application; or, if possible, so divided

that the contents of one bottle should not be strong enough, or not sufficient, to destroy life if taken by mistake. Each bottle to be of the shape for containing poisons, and bearing the poison labels.—4th. As mistakes will occur after adopting every precaution, or a lotion may be taken by design, it would, therefore, be well that whenever deadly poisons are prescribed in a lotion, the name of the poison should be distinctly written in one corner of the label, in order that the surgeon called in to attend such a case may know at once, by seeing the bottle, the name of the active poison which has been taken, and so be enabled to administer the proper antidote without delay.

"*Ignoramus.*"—(1.) Carbonate of zinc. (2.) The precipitate insoluble in excess of the reagent must be an impurity.

A. S.—It will not.

Apprentice (Leicester).—See Professor Bentley's Papers on New American Remedies.

"*An Associate*" (Manchester).—The new edition may be expected in January next.

"*Student*" (Brighton).—Yes. See Pereira's "Manual of Materia Medica.

"*An Assistant*" (Edinburgh) suggests "a course of lectures on the different subjects of which a knowledge is demanded by the Pharmaceutical Society, at fees consistent with the salaries they receive." As the lowest fee for any of the classes is three guineas, our correspondent thinks that some attempt should be made to provide instruction in these subjects, at a much cheaper rate, in Edinburgh, as has been done in London.

"*Inquirer*" (Grantham).—No.

A. B. C. (Cranbrook).—The information respecting cost of fees, etc., may be obtained on application, by letter, to the Secretary.

T. E. (Salford) is not eligible. See Pharmacy Act in our present Number.

"*Cæsalpina*" (Bath).—(1.) See page 113. (2.) Uncertain; the Register will be published in January. (3.) About January, 1869.

M. D. (Tuam).—We are not aware that Tincture of Indian Hemp enters into the composition of Chlorodyne.

"*An Apprentice*" (Woolwich).—A new edition is in the press, and will be out shortly.

"*Leamingtonian.*"—Soluble in water.

"*An Associate.*"—*Sapo mollis* is made from Olive Oil and Potash.

W. A. (Dumfries).—(1.) Under the provisions of the new Act, grocers cannot legally retail Laudanum. (2.) The restrictions on the "Sale of Arsenic Act" refer to Arsenic, Arsenious compounds, and all colourless preparations thereof.

F. R. G. S.—By research in physical science.

J. L. W. (Bridgewater), in reply to "*Matico*" in a former number, suggests Iodide of Potassium for the purpose required.

W. E.—No. See present number of this Journal.

"*Assistant*" (Kilburn) suggests that all Assistants who pass the Modified Examination under the new Act be registered as Associates on the payment of five guineas.

ERRATA.—In last month's Journal, p. 87, lines 18, 19, and 25 from top, *for* "Dr. Guming" *read* Dr. Gunning. Page 111, 7 lines from bottom, *for* "rim," *read* real, *i. e.* 4 inches from the bottom of the vessel.

We have received numerous letters asking for information respecting the working of the new Pharmacy Act. Explanation on the points in question will be found in our present number, page 113. In case of any special difficulty, application should be made to the Registrar, 17, Bloomsbury Square, who will give any further information that may be required.

Communications are acknowledged from Mr. J. C. Smith, Mr. Morris, Mr. Ball, and Mr. Ryder.

Instructions from Members and Associates respecting the transmission of the Journal before the 25th of the month, to ELIAS BREMRIDGE, Secretary, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Messrs. CHURCHILL, New Burlington Street. Other communications to the Editors, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. X.—No. IV.—OCTOBER, 1868.

PRESCRIBERS AND DISPENSERS, THEIR DUTIES AND MUTUAL RELATIONSHIP.

The due discharge of the duties appertaining to the administration of medicine involves a frequent consideration of the mutual relationship existing between those engaged in the practice of its several departments. The institution of medicine has for its object the relief of those who suffer from bodily ailments, and the interests of these must be considered paramount to all others in the arrangement of duties to be performed.

The patient calls to his aid the administrators of a noble profession, the "divine art" of healing the sick; his life is placed in their hands with a confidence that the best available knowledge and judgment and care and attention, consistent with the reward he is able to give in return, will be exercised in his behalf. His knowledge does not enable him to judge of the means used, excepting through the character and reputation of those he employs to apply them. It is a case in which the fullest confidence is reposed, and sacred duties are implied.

The members of the medical profession are deservedly held in high esteem; they are admitted to the homes, and necessarily become acquainted with many of the internal arrangements of the families of all classes. Nor is there any want of a due sense of the great responsibility implied in this position. Talent and learning and patient research and laborious application, are devoted to the cultivation of the science of medicine, a science the principles of which are involved in much obscurity and require for their development some of the acutest powers of the human mind.

The physician prescribes and the pharmacist prepares and dispenses the remedies intended for the relief of suffering, or the removal of some cause of impediment to the due performance of the natural functions of the body. Every facility should be offered for rendering the means provided for accomplishing the intended purpose as effectual as possible. Just as a good understanding and great confidence should exist, and do exist, between patient and physician, so should there be a similar relationship between the prescriber and the dispenser of medicines.

The first condition essential to the establishment and maintenance of the relationship required is that neither party should trench upon the ground rightly occupied by the other,—that there should be no clashing of interests, no cause for mutual mistrust or jealousy. The more completely the functions of the two departments of prescribing and dispensing are separated, the more will the relationship existing between those engaged in performing them be likely to conduce to the advancement of medical science and the best interests of humanity.

It is the duty of the prescriber to make the instructions conveyed through the prescription as intelligible and easy of execution as possible. Every avoidable difficulty placed in the way of the dispenser may be compared to an obstruction or defect in a railway, caused by careless inattention, the effects of which may be visited upon helpless passengers, who would have just ground of complaint for such culpable conduct.

Clearness of diction and legibility of writing are of course primary essentials in a prescription. Complaints have sometimes been made of want of attention to these requisites, and it must be admitted that a little more care in acquiring the habit of writing distinctly would be very desirable in some instances. But it is astonishing how much can be done by practice in learning to decipher writing which to the inexperienced would be unintelligible. We are far from thinking that there is any general ground for complaint on account of the writing of prescriptions, for it must be borne in mind that while it is the duty of the physician to write legibly, it is equally the duty of the dispenser to become an *expert* in the power of reading bad writing.

The language and the nomenclature adopted in prescriptions are, or ought to be, the result of conventional arrangement,—the necessity for the adoption, as far as possible, of uniformity in these respects being founded upon the obvious tendency of any deviation from such a practice to weaken the security of the patient by causing confusion and increasing the liability to accident. We should be sorry to see the use of Latin relinquished. It is a language the knowledge of which is acquired in all civilized countries, and it is well adapted for the abbreviated writing commonly used in prescriptions. The nomenclature should in every case be founded upon the type, whatever it may be, of that used in the Pharmacopœia. Any show of scientific learning, by making the names of medicines to accord with modern theories, is an innovation that would be out of place here. The primary consideration is the avoidance of ambiguity, and this is best effected by complete conventionality.

The Pharmacopœia is the first and principal guide for interpreting the terms of the prescription. Wherever it applies its authority is supreme, and it is the duty of prescribers and dispensers to follow it in all that it relates to as closely as possible. There is, happily, but one national Pharmacopœia, which supersedes all others in authority, and leaves no valid excuse for rejecting or modifying the instructions contained in it. The physician will find here all the best established and most generally used medicines, more fully and correctly described than they have been in any other similar work. No slight fancy or mere prejudice should be allowed to interfere with the adoption in all cases of the only legally authorized standard for the maintenance of uniformity and the prevention of confusion, uncertainty, and error.

If, as sometimes occurs, it should be necessary to go beyond the confines of the Pharmacopœia, in seeking some form of remedy not there indicated, it becomes most important to look well to the principles upon which the selection is made, and to the terms in which the remedy is prescribed. As a rule, it is inconsistent with the character of a learned and scientific profession, such as that of medicine, to patronize or in any way to encourage the use of secret medicines or mere nostrums. There are exceptional cases in which experience has demonstrated the value of medicines the exact composition or mode of production of which is not generally known, and these will sometimes be used with advantage, although it must always be regretted, in such cases, that science is deprived of the means of tracing effects to their inferred causes. In a liberal profession the greatest openness is expected, and there is no profession in which a greater amount of liberality or less of selfishness is manifested than that to which we are referring.

Medicines that are not included in the Pharmacopœia, when ordered in

prescriptions, should be defined with scrupulous care and exactness, either directly or by reference to some generally accessible source of information. It is in the case of non-official medicines that difficulty from uncertainty most frequently occurs, and it should therefore be most carefully provided against. Unfortunately a large number of such medicines are constantly forced upon the attention of medical men, and they are not unfrequently prescribed, perhaps without due consideration of the probable influence of such a practice. It has sometimes led by insensible gradations to practices still more objectionable,—to prescribing in cipher, and to the use of terms not comprised in the conventional rules of the profession. The adoption of such practices is equivalent to impeding a railway-train at the imminent risk of the destruction of life.

Cases such as we have just referred to are fortunately rare exceptions to the general rule which maintains the authority of the Pharmacopœia and repudiates quackery as inconsistent with the high character of a liberal profession. It behoves those who occupy the position of dispensers to contribute their part, faithfully and well, in furtherance of the objects so greatly to be desired. Their discretion is more limited but their duty is not less sacred than are those of the physician. They are the interpreters and part-executors of the instructions contained in the prescription. They are expected to act with intelligence and judgment, and faithfully to fulfil the duties which devolve upon them. Any medicine prescribed by a name used in the Pharmacopœia, without any qualifying mark or expression, should strictly answer to the description given in that work. This is a rule that will hardly admit of exception, for it is to be hoped that any medical man, upon reflection, would see the impropriety of verbally directing a deviation from the simple and only safe course which law and practice and common sense indicate.

If the relationship most natural and befitting for those whose duties are so naturally dependent, be established in good faith, and have for its primary object the advancement of the interests of medicine as an art and science, blessed alike to those who administer and those who are administered to, they will unite in furthering harmonious co-operation, by which the interests of all parties concerned will be most effectually secured.

THE DREAD OF AN EXAMINATION.

Let us try, whilst on the eve of an opening session, to rob this ordeal of its terrors. During the past two months the Secretary of this Society and certain others have been overwhelmed with letters desiring information as to the exact limit of qualification required in order to enjoy the privileges accorded by the Amended Act of Pharmacy. Most of the questions asked might have been spared by an attentive reading of the September number of the Journal: our present duty, however, is not to enter on a review of laws and schedules, but to say a few kind, though serious, words to Assistants of long standing and undoubted capability, whose inquiries have formed a minimum portion of the late correspondence. They have our most cordial sympathy and strongest wishes for their future welfare. It is perfectly intelligible, that those who are conscious of being skilled dispensers, competent to conduct the entire routine of a druggist's business, and superintending others less experienced than themselves, and to some extent advanced both in years and station, should hesitate to be exposed to the smallest chance of failure.

That men so well fitted to do credit to themselves and reflect honour on the Society to which they might belong, should not have availed themselves of the position which the formality of an examination would have conferred cannot be otherwise than a subject of regret; and if it be stated that fami-

liarity with practical detail is one thing, while technical knowledge is another, it may be answered fearlessly that the daily devotion of the work of one morning or evening hour, for no longer period than three months, would enable such a student to satisfy the most rigid examiner.

Let us, in this calm autumn month, quietly talk the matter over. What is the nature of this proposed Modified Examination, which has caused such a flutter of consternation? Strip it of technicalities and this is the result. Candidates must know how to read prescriptions, write a label, and be on their guard against dispensing a drachm of arsenic if ordered for a dose; they should be thoroughly clear in their own minds that rhubarb is not jalap, nor ought they to confuse senna leaves with chamomile; they should know when calumba root is good, and when it might reasonably be rejected. Further, it has been thought not a too stringent regulation that compound tincture of cardamoms should be distinguished from sal volatile, and that the proportion of the active ingredients existing in more powerful remedies should be remembered. Seven plants have to be recognized, all specified beforehand, being the amount of botany required, and the assistant should be able to determine whether specimens submitted are such as he would choose to vend in an establishment of his own. What less could he be asked to know? With how much less would he feel comfortable himself? We implore those interested to take the matter into their earnest consideration: at least let them shake off once and for ever the shadow of that unwholesome fear of an examination which might paralyse their exertions.

Here we must pause while an episode of argument is presented. There are men amongst us (long may they remain) who have borne the full heat and burden of their day. Popularly they are described as the founders of our Society. Whether so or not is matter of no moment. Early in life they accepted pharmacy as a vocation; they struggled hard during many an unprofitable season to scrape together a decent business. That unremitting care, assiduous application, and never wearying exertion should be finally rewarded is but an illustration of the eternal law, that whatsoever a man soweth he shall reap.

They have succeeded,—have made money, and transmitted to their descendants the heritage of a name as well as solid pecuniary advantages. Shall we say they were subjected to no examination; why should we? No; for these men are, of all others, the most eager that their sons should accept the better and larger facilities of the age in which we live; the first to rejoice over and to advance the cause of classical and pharmaceutical education; the first to feel grateful that their children are spared the drudgery, loss, and social degradation which their fathers not unfrequently were forced to undergo; the last to entertain any sympathy with scarcely fledged apprentices, who would rather indolently sink into a duck-pond than manfully prepare for the duties that lie before them.

Respecting these, by far the most numerous class of applicants for information, we scarcely know what to say. At the commencement of a new phase in the career of Pharmacy not one word of discouragement shall escape our lips. These young gentlemen being occasionally of the advanced age of twenty-one, having served a few years' apprenticeship less or more, and in some cases having been assistants for two years at most, tremble with anxiety to ascertain whether the provisions of the Amended Act will wink at such a want of qualification, and permit them to remain incompetent for life. We can imagine no greater mistaken kindness than the slightest effort made in this direction, and no conduct more suicidal. The pharmacist of to-day cannot rest the druggist of fifty years ago. All classes are influenced by the progress of the age; the world imperatively demands more than ever it did be-

fore from those who, in the battle of life, are compelled to fight for their daily bread. Pharmacy forms no exception to the rule.

Often in these pages has study been recommended on its own account, and for the sake of those intellectual pleasures which alone it can bestow. A few days hence this and other aspects of student-work will probably be introduced by one who is singularly competent for the task. It remains our duty distinctly and unhesitatingly to allude to trade considerations: let these young inquirers rest thoroughly persuaded that just in proportion to their individual attainments in those branches of science, by the knowledge of which they have to gain a livelihood, will be in the usual order of God's providence their chance of ultimate success. This positive and personal acquirement (of which no man and no circumstances can deprive them afterwards) utilized and directly made to bear on daily business, constitutes the secret of modern enterprise. Others (marvellously few) a century ago hit on the same plan and kept it dark; now, every year adds to the number of those who are sharp enough for their own interest to follow the example.

The future pharmacist must be prepared to run the race, or, without the slightest figurative allusion, there will be no crown for *him*. May we invite such as have not entered the lists already, to avail themselves of the advantages offered by this Society? nowhere will they find means more directly adapted to the end in view; we have occasionally thought they were neglected because too cheap. A fair acquaintance with the three great branches of instruction given is indispensable, unless the druggist be content to be outstripped by others; laboratory manipulation, analysis, whether applied to commercial or scientific purposes, is of a practical importance which cannot be estimated.

We ask our young friends to think the question over solely, just this moment, from the view-point of personal advantage, and trade gain. Once more rises the spectre of three examinations—they form three tests by which the student may ascertain how he stands. Let him not include this dread amongst his other anxieties,—surely we have laid the ghost.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *September 2nd*, 1868,

Present—Messrs. Bottle, Deane, Edwards, Morson, Randall, Sandford, Standring, and Stoddart,

The following was elected a

MEMBER.

Duffin, Thomas..... ..... Wakefield.

Mr. Thomas Brend, of Swansea, having paid his arrears, was restored to Membership.

The Secretary submitted the following communication:—

"*Plough Court, Lombard Street, E.C., Sept 2nd*, 1868.

"To Mr. E. Bremridge, 17, Bloomsbury Square.

"Dear Sir,—As President of the British Pharmaceutical Conference, I have been requested to communicate to the Council of the Pharmaceutical Society a resolution of the Conference, to this effect:—

"'That the permission of the Pharmaceutical Society be asked for the use of their house for holding a meeting, on Tuesday, the 6th of October, for the purpose of considering in what manner a public recognition of the services of George Webb Sandford, Esq., in connection with the recent Pharmacy Act can be best carried out.'

"Requesting you will bring this matter before the Council of the Society during their meeting of this day,

"I remain, dear Sir, yours faithfully,

"DAN. HANBURY."

The Secretary was requested to inform Mr. Hanbury that the Council would be most happy to give the required permission.

BENEVOLENT FUND.

The following list of approved candidates for election as annuitants was submitted :—

APPROVED CANDIDATES.

(*Alphabetically placed.*)

1. ANDERSON, CHARLES THOMAS. Age 62. Member of the Society from 1852 to the present time. In business in Guernsey three years and in Jersey thirty-two years. Has for six years past been suffering from rheumatic gout, and is now a complete cripple and unable to do anything for himself. In consequence of this affliction, has been compelled to close his shop. Wife aged 51, and two daughters aged respectively 15 and 13.

2. FARROW, MARTHA JANE, Widow. Age 61. Husband member of the Society from 1853 to the time of his death in 1864. In business at Woburn, Bedfordshire, five years. Means of subsistence, chiefly needlework, but eyesight failing, now principally from friends. (*Second Application.*)

3. GREAVES, HANNAH, Widow. Age 75. Husband member of the Society from 1842 to 1851 ; died in 1852. In business at Knottingley, near Pontefract, thirty-three years. Applicant suffering from a fall. At present is living with her son, who is in ill-health and poor circumstances.

4. TRUMPER, RICHARD. Age 61. Member of the Society from 1845 to the present time. In business at New Ferry eleven years, and at Old Swan, near Liverpool, four years ; relinquished business in 1862, being, from gout and rheumatism, unable to attend to it, and is now wholly incapable of exercise or doing anything for himself. Means of subsistence a small weekly allowance from wife's brother. Wife aged 58 ; in ill-health. (*Second Application.*)

5. WATKINS, JOHN. Age 64. Member of the Society from 1842 to the present time. In business at Hackney three years, Abergavenny three years, and Stratford fourteen years. Has had a large family. There are now dependent upon him : wife, aged 50 ; daughter, aged 28 ; and two sons, aged respectively 13 and 11 years.

6. WICK, JAMES. Age 66. Member of the Society from 1841 to the present time. In business at Hadleigh, Suffolk, forty years : compelled to relinquish it in consequence of losses in and depreciation of business and increasing age. Means of existence none, save occasional temporary employment. Wife aged about 66 ; suffering from an accident.

BENEVOLENT FUND.

SUBSCRIPTIONS AND DONATIONS RECEIVED DURING AUGUST AND SEPTEMBER.

SUBSCRIPTIONS.

LONDON.

	£	s.	d.		£	s.	d.
Bosley, J. L., 280, Fulham Rd.	0	10	6	Cocksedge, Henry B., 20, Bucklersbury	0	10	6
Brooks, Chas., Wandsworth Rd.	0	10	6	Davenport, J. T., Gt. Russell St.	2	2	0
Cannon, Charles, 85, Upper St.	1	1	0	Francis, Geo. B., 5, Coleman St.	1	1	0
Churchill, John and Sons, New Burlington Street	1	1	0	Gillman, Henry, Boy Court	0	10	6

	£	s.	d.
Gorton, J. G., 144, Whitechapel	0	10	6
Hickman, Wm., Notting Hill	0	10	6
Jackson, J., Southampton Row	1	1	0
Jacobson, Nathaniel, Walbrook	1	1	0
Kernot, Dr., Chrisp St., Poplar	0	10	6
May, W. H., Guilford Street	1	1	0
Parkinson and Son, Southampton Row	1	1	0
Pidduck, John, Harrow Road	0	10	6
Roach, Pope, 8, St. James's St.	0	10	6
Suart, Benjamin, 14, Bath St	1	1	0
Thompson, J., 11, Aldersgate St.	1	1	0

COUNTRY.

	£	s.	d.
Ashford, Ingall, Joseph	1	1	0
Ashton-u.-Lyne, Bostock, Wm.	0	10	6
Bath, Brooke, C.	0	10	6
Bideford, Sill, S.	0	10	6
Birkenhead, Reece, John	0	5	0
Birmingham, Clayton, Francis C.	0	10	6
Bridgwater, Woodward, J. L.L.	0	5	0
Brighton, Foster, Frederick	0	10	6
Bristol, Chemists' Assistants' Association	1	1	0
„ Flower, R.	0	2	6
„ Jones, E. H.	0	2	6
„ Lacey, Walter	2	2	0
Cardiff, Joy, Francis W.	0	10	6
Cheshunt, Butt, Edward N.	0	10	6
Chowbent, Warburton, Thomas	0	5	0
Cottingham, Lister, George	0	10	0
Darlington, Abbott, John T.	0	5	0
Dartford, Edwards, George	0	10	6
Deptford, Lloyd, Henry	0	10	6
„ Lockyer, George	0	10	6
Edinburgh, Raimes and Co.	1	1	0
„ Smith, Thomas	2	0	0
Forest Hill, Furze, Henry	0	10	6
Grantham, Newcome, John	1	1	0
Hambledon, Gunn, John	0	5	0
Horsham, Jull, Thomas	1	1	0
Kidsgrove, Pickburn, G. H.	0	5	0
Leicester, Richardson, J. G. F.	1	1	0
Leytonstone, Telfer, Frederick	0	10	6
Liverpool, Sleggs, George R.	0	5	0
Loughborough, Paget, John	0	5	0
Lyme Regis, Henley, Henry	0	5	0
Manchester, Mather, William	2	2	0
„ Mumbray, H. Geo.	0	10	6
Margate, Candler, Joseph T.	0	10	6
Newtown, Morgan, Richard	0	10	6
Needham Market, Harrington, A.	0	7	6
Northampton, Mayger, W. D.	1	1	0
Oundle, Turner, Robert	0	10	6
Oxford, Houghton, Thomas	0	10	6
Paulton, Bush, Thomas	0	5	0
Portsmouth, Pasmore, George	0	10	0
Quorndon, Squire, Benjamin	0	1	0
Rothbury, Farrage, Robert	1	1	0
Saltaire, Bayley, G. H.	0	2	6
Scarborough, Smart, John	0	10	6
„ Whitfield, John	1	1	0
Sidmouth, Chessall, Rowland	0	10	6
St. Asaph, Roberts, Peter	0	10	6
St. Leonard's, Maggs, Samuel B.	1	1	0
Stratford, Howard and Sons	2	2	0
Strood, Picnot, Charles	1	1	0
Tadcaster, Hammond, J.	0	5	0
Tenterden, Willsher, Stephen H.	0	10	6
Tunbridge, Millidge, Thomas E.	0	10	6
Tunbridge Wells, Dunkley, Ed.	0	5	0
Wakefield, Duffin, Thomas	0	5	0
Waltham Abbey, Marshall, J. A.	1	1	0
Warrington, Webster, Saml. M.	0	10	6
Watford, Oldfield, Henry	0	10	6
Winchcombe, Howman, Philip	0	5	0
Yeovil, Manning, T. D., jun.	1	1	0

DONATIONS.	£	s.	d.
Birmingham, Clayton, Francis Corder	0	10	6
Macclesfield, Smallwood and Son	1	1	0
North Walsham, Lacey, Richard	0	3	0
Ramsgate, Fisher, Charles	5	5	0
Ryde, Pinniger, Wiliam R.	1	1	0
Wimbledon, Mellin, Joseph P.	5	5	0
Finch, Joseph Newman	1	1	0

SYNOPSIS OF THE MODIFIED EXAMINATION FOR ASSISTANTS UNDER SECTION 4 OF THE PHARMACY ACT, 1868.

APPROVED BY THE PRIVY COUNCIL.

"PRESCRIPTIONS.

"Candidates will be required to read Autograph Prescriptions, translate them into English, render a correct Translation of the Directions for Use, and detect Unusual Doses.

"PRACTICAL DISPENSING.

To weigh, measure, and compound Medicines, write the Directions in suitable language, finish and properly direct each Package.

"MATERIA MEDICA AND QUALITY OF SPECIMENS.

"To recognize the Pharmacopœia Chemicals in frequent demand, and specimens of Roots, Barks, Leaves, Fruits, Resins, and Gums in ordinary use; the following Plants, either in a fresh or dried state, or from plates:—Belladonna, Stramonium, Hyoscyamus, Conium, Aconitum, Digitalis, and Sabina; also to estimate the quality of each specimen submitted and its freedom from adulteration.

"PHARMACY.

"To recognize the Preparations of the Pharmacopœia which are not of a definite Chemical Nature, such as Extracts, Tinctures, and Powders, and give the proportions of the more active ingredients."

Persons passing the above will be registered as CHEMISTS AND DRUGGISTS. The Board will meet to examine candidates for the Modified Examination on Friday, November 6th, at 10·30 A.M. (For further particulars, see p. 2 of cover.)

PROPOSED SANDFORD TESTIMONIAL.

The following Circular has been issued by the Honorary General Secretaries of the British Pharmaceutical Conference:—

October 1, 1868.

Sir,—The accompanying Resolutions were unanimously adopted at the Annual General Meeting, recently held at Norwich.

Proposed by Mr. REYNOLDS (Leeds), seconded by Mr. SEARBY (Norwich):—

"That the cordial thanks of this Conference and the whole Profession are due, and are hereby tendered, to the President of the Pharmaceutical Society, and those who have laboured with him, for those exertions in the cause of Pharmaceutical Education which have resulted in the Pharmacy Act of 1868."

Proposed by Mr. J. D. SMITH (Norwich), seconded by Mr. CALEY (Norwich):—

"That it is desirable there should be some public recognition of the services rendered to the cause of Pharmaceutical Education, and the improvement of the status of the Profession, by Mr. GEORGE WEBB SANDFORD, President of the Pharmaceutical Society, to whose careful and constant devotion the passing of the Pharmacy Act of 1868 is in great measure due."

Proposed by Mr. GROVES (Weymouth), seconded by Mr. PITTS (Norwich):—

"That the President of the Conference be requested to address the Council of the Pharmaceutical Society, requesting the use of the Society's House for the purpose of holding a Meeting on Tuesday, the 6th of October next, with a view to the carrying out of the foregoing Resolutions."

We have to announce that a Meeting will accordingly be held at 17, Bloomsbury Square, on Tuesday Evening, the 6th inst., at 8 P.M., when your support and attendance, if possible, are requested.*

We are, Sir, your obedient Servants,

JOHN ATTFIELD, 17, Bloomsbury Square, London, W.C.
RICH. REYNOLDS, 13, Briggate, Leeds.

BRITISH PHARMACEUTICAL CONFERENCE.

(*Continued from p.* 165.)

Second Day.

The meeting opened at 10 A.M. on Wednesday.

Foreign Members.

Mr. BRADY introduced the question of electing a limited number of foreign members, and moved the following resolution :—

"That it is expedient to include in the list of members of the Conference the names of gentlemen, not resident in Great Britain but identified with the progress of pharmacy or conspicuous for their attainments in sciences allied thereto, who have contributed to its usefulness or in other ways shown themselves interested in its proceedings. That such gentlemen be regarded as 'foreign members;' that in their case the annual contribution to the funds of the Conference be regarded as commuted, and that it be a duty of the Executive Committee to bring forward for election at the annual meetings the names of gentlemen whom it is desirable so to distinguish."

Professor ATTFIELD seconded the resolution, which was carried.

Place of Meeting for 1869.

The PRESIDENT said that the question of the place of meeting of the Conference for the year 1869 would be now introduced, and he called upon the Secretary to read an invitation received from Exeter, which it seemed most likely would be the place selected for the next meeting of the British Association.

"To the President, Vice-Presidents, and Committee of the British Pharmaceutical Conference.

"Gentlemen,—In the name of the Chemists and Druggists of the City of Exeter, I earnestly hope that the annual Conference will be held in our city in 1869. I feel certain that my brother chemists will do all in their power to render the meeting an agreeable one.

"(Signed) JOHN PALK."

Mr. A. P. BALKWILL, of Plymouth, wrote .—

"I suppose we shall have to yield to Exeter the meeting of the British Association for 1869, but whether at Exeter or Plymouth we shall be glad to welcome the British Pharmaceutical Conference."

Mr. J. B. GUYER, of Torquay, said that he could assure his fellow-members of the Conference that the chemists of Torquay would offer a hearty welcome

* Gentlemen desiring to have their names placed on the list of any General Committee that may be formed at the Meeting, are requested to communicate with Professor Attfield.

to any of them who visited the West for the purpose of attending its congress in 1869.

Mr. J. Raymond King presented himself as a delegate from the chemists of Bath, and regretted his inability to be present at the first sitting. He hoped that the Conference would go westward next year. The meeting of the Conference held in Bath four years since had left good results behind it, and would long be recollected with satisfaction.

Mr. Savage, of Brighton, said that although the town which he represented was a candidate for the meeting of the British Association, yet he feared it would have to wait until 1870 for that honour, and then he trusted the Conference would also meet at Brighton.

Professor Attfield was authorized to state that the invitation received last year from Liverpool was to be considered a standing one until the British Association visited that town. The resolution embodying the request was as follows :—

"That the Council of the Liverpool Chemists' Association will welcome the British Pharmaceutical Conference, if it should accompany the British Association in its anticipated visit to Liverpool, and will use every effort to render its visit successful."

In accordance with the usual custom, the decision upon the meeting of next year was postponed to a future day, when it might be known definitely at what place the British Association would hold its meeting for 1869.

The reading of papers was then resumed.

GRANULAR CITRATE OF MAGNESIA.

BY F. C. CLAYTON.

In bringing before the Pharmaceutical Conference a few notes on this subject, I must apologize for not having made my investigations so minute as could have been wished; but as there seemed no prospect of making them more complete by delay during another year, I submit them at the present meeting.

Granular citrate of magnesia has been an article of commerce for something over ten years, and a very interesting paper on it will be found in the 'Pharmaceutical Journal,' vol. i. 2nd series, pp. 301–304, together with a discussion that took place on its being read at one of the evening meetings at Bloomsbury Square. The remarks there made upon its composition and mode of preparation are still to a large degree correct; but having had considerable experience in its manufacture, and also of comparing notes with other makers, it may be well to go over the ground *de novo*, first making a few remarks upon its name.

At the meeting above alluded to, some exception was taken to the term "citrate of magnesia," as not really representing its composition, and the reason of its being called so has, I believe, never been cleared up.

I am, however, able to state, by the permission of Mr. Bishop (and I believe it is generally conceded that he is the original manufacturer), that when he first prepared it in 1857, he "used a good deal of neutral citrate of magnesia." He also writes me, "I had to abandon this plan, by finding the compound would not keep, soon losing its effervescence and colour."

Whilst speaking of the name, I would just note the "true citrate of magnesia," introduced by Mr. Dymond to the meeting of the Conference at Dundee, and which was for a while made as a granular preparation, but, having ceased to be so, it no longer comes within my province.

I now pass on to the *composition* of the granular citrate of magnesia, which, as Mr. Draper says, consists of—

Soda and Magnesia.	Sulphuric, Tartaric, and Carbonic	Acids,

and, I may add, sugar and citric acid, and, as a flavouring, essence of lemon.

The article analysed by Mr. Draper contained no citric acid: to use his own words, "the absence of citric acid . . . was also established." I have made several attempts myself to obtain a granular preparation without any, and I know others who have done the same; but have never succeeded. All the samples which I have examined contain it, and I think we may therefore conclude that *citric acid* is now always a constituent. That *sugar* enters into it is proved by the taste, although I know of one firm who for some years used the following formula:—

Sodæ Bicarb.	16 oz.
Acid. Tartaric. . . .	10½ oz.
Acid. Citric.	5 oz.
Magnes. Sulph. . . .	1 oz.

with a little water to help the granulation. Any one tasting this would at once be struck with the difference between it and that now generally sold. The proportion generally varies from 6 oz. to 16 oz. of sugar to 16 oz. of soda, but in one or two cases I have found it to exceed that.

As we are all aware, the trade in this article has increased enormously during the last few years, and at the same time the price has been reduced; the manufacturer therefore has had to turn his attention to the use of the cheapest materials.

The articles above enumerated are still all that are to be found in it, but they do not convey the information as to *how* they exist. It is at once evident that the maker must keep down the proportion of citric acid, and add as much sugar as possible, for while nothing, so far as my experience goes, will make a better preparation than equal parts of citric and tartaric acids, yet, when cost has to be considered,* it is very evident that the more expensive one must be replaced by something else.

Now, sugar, to a certain extent, promotes granulation, but it will not do alone. Water drives out too much gas, but in the use of a small proportion of sulphuric acid, or bisulphate of soda, the manufacturer can reduce his cost to a minimum. I believe the first mention of the use of bisulphate of soda is to be found in the 'Chemical News,' vol. xvi. p. 269, by a Mr. Scott; but, from the way it is mentioned, the writer did not, apparently, know much about it from experience. I do not remember to have seen the use of sulphuric acid recorded anywhere, though it has had a limited use, to my knowledge, for three years. I have not, however, found the employment of these articles so general as might be expected among the cheaper preparations, notwithstanding the publicity given to the suggestion. The use of citric acid alone makes the article so much more difficult to manufacture, and not so good for keeping or effervescence, that I believe none is now made; though, for a while, a house made and sold a ton or two of it. It is rather softer on the palate than when containing tartaric acid.

In concluding this part of my paper, I would recommend any one who wishes to imitate the articles now sold to try the following formulæ:—

Sodæ Bicarb. . .	16 oz.	16 oz.
Acid. Tartaric. . .	8 oz.	10½ oz.

* This applies particularly at the present time, August, 1868, when tartaric is worth 1*s.* 3*d.* and citric 2*s.* 8*d.* per pound.

Acid. Citric. . . .	8 oz.	4 oz.
Sugar	4–8 oz.	8–18 oz.
Magnes. Sulph. . .	0–½ oz.	0–1 oz.
Sodæ Bisulph. *Cryst.* ...		2 oz. or
Acid. Sulph.		5 dr. fl.
Ess. Limonis . . .	q. s.	q. s.

On the Mode of Preparation.

The ingredients are mixed in the usual manner by sifting, and thrown on to a hot metal plate to a depth of not more than half an inch. In a few minutes the mixture becomes spongy, when it is worked about and turned over with a scoop or other convenient instrument, to prevent any particles becoming too dry.

In a minute or two more (this is the most delicate part of the operation, but impossible to describe on paper) it should be thrown on a cold slab, and put through a sieve of 4–6 meshes per inch, again heated and sifted through a rather finer sieve, the dust separated, and finally heated till desiccation is complete. It is well to watch it at first, to see that the newly-made granules do not adhere to each other; but during the latter part of the final drying this is unnecessary.

The metal plate may be of tin, enamelled iron, zinc, or tin, and I know all these are used, and very likely copper may do, but I have never heard of its use on the large scale. I would recommend zinc, from its cheapness; plates that have been in nearly constant use for two years are but slightly bulged,—the original cost being 39*s.*, thus showing a great advantage over tin, and I know of nothing against it. *En passant*, a manufacturer with whom I was acquainted dried his preparation in a warm closet on skins of white leather, but the reason I know not.

The *modus operandi* above described may not be universal, but I have found it answer well, and seen it employed by other parties. It is best to sift the dust out before the article is dry, as the dust then works in well with the next batch. A batch should not be more than 30 lbs. to be well attended to, and the loss in making is from 10 to 12 per cent.

In conclusion, I must just refer to Sodæ Citro-tart., B. P. If this article is introduced on its own merits, I have nothing to say about it; but if as a substitute for granular citrate of magnesia, it is a decided failure, because it is too alkaline, and contains no sugar.

Birmingham, August, 1868.

The PRESIDENT agreed with those who condemned the use of the term "Citrate of Magnesia" for such a compound as was now sold under that designation. On the Continent this name was applied to a true citrate of magnesia that was sold in the shops.

Mr. GROVES said that the dose of the true citrate of magnesia was very large, being about two ounces.

SENNA.

BY THOMAS B. GROVES, F.C.S.

What I have to say about this interesting article of Materia Medica will be confined to its chemical history, ancient and modern, and will include an account of some attempts I have recently made to set at rest disputes as to the nature and properties of its active principle.

A comparison of the statements of authors of repute respecting this active principle will show at once the necessity there existed for bestowing further labour on the subject. The analyses given by Pereira comprise one by Braconnot of the watery extract of Alexandrian senna, one by Lassaigne and Fenuelle of senna leaves, and one by Fenuelle of senna legumes. It will be sufficient for my purpose to quote parts only of these analyses. Thus Braconnot finds in 104·2 pts. of watery extract of Alexandrian senna 53·7 pts. of the bitter matter of senna; as senna is not bitter when unmixed, it is pretty clear that Braconnot operated on a sample of senna containing the bitter leaves of *Cynanchum Argel*, without making allowance for the fact. He mentions also 31·9 per cent. of reddish-brown gum—a most indefinite term. On the whole, it may be said that the analysis is perfectly useless.

Lassaigne and Fenuelle give a qualitative statement only, at the head of which figures cathartin, a principle (?) found also in senna legumes by Fenuelle. This substance is described as being yellowish-red, uncrystallizable, with a peculiar odour and a bitter nauseous taste, very soluble both in water and alcohol, but insoluble in ether. Its aqueous solution is precipitated by infusion of galls diacetate of lead, etc. etc. Three grains caused nausea, griping and purging. Its preparation is thus effected. To a filtered decoction of senna add acetate of lead, filter, remove the excess of lead with sulphuretted hydrogen, filter and evaporate to an extract, which exhaust with rectified spirit; again evaporate to an extract, add a little sulphuric acid to remove potash, present in combination with acetic acid, and finally purify *secundum artem* from traces of lead or of sulphuric acid if necessary. This substance, which I need scarcely say is not worthy of the name of "active principle," inasmuch as it is quite destitute of "activity," and is not a "principle" but a complex mixture, long passed muster as the so much desired and so often missed senna cathartin; its discovery was announced in 1821. Bley and Diesel pronounced it to be a mixture of resinous and extractive matters; they might with truth have added "derived partly from senna, partly from *Cynanchum Argel*."

In 1845, a prize of 500 francs was offered by the French, for the best essay on the chemistry of senna, but an answer not being forthcoming, the offer was renewed in 1857, the prize being increased to 1000 francs,—still no response.

In the same year, however, Martius gave the subject his attention, and pronounced an opinion that senna owed its activity to chrysophanic acid, a body of very stable constitution, and in that respect very unlike what might have been expected from senna. Its hitherto acknowledged sources were rhubarb and the lichen *Parmelia parietina*. Martius was controverted by Sawicki, who urged the little solubility of the acid. Wiggers, however, came to the rescue with a suggestion that the combination of the acid with certain bases would give it the required amount of solubility in water.

In this there is a somewhat near approach to truth; Martius may be said to have "burned," but he did not "touch" the coveted principle.

Before proceeding to the analyses of senna, published within the last few years, I will refer to the notions of the ancients as to the proper modes of preparing senna for administration. It will be found that our remote predecessors were not deficient in the power of observation, whatever might have been their deficiencies in scientific knowledge; that their practice if not their theory was correct. Thus the Arabian physicians held that long boiling impaired its activity, so did Culpepper, and cautions accordingly. Heerlein, a modern writer, denies this, but not upon satisfactory grounds. Its purgative power is said by some to be increased by combining with the senna any simple bitter. The infusum amarum purgans and the mist. gentianæ co. owe their origin probably to this idea. It might even throw light upon the practice (which undoubtedly was not of modern invention) of "adulterating" Alexandrian senna with the leaves of *Cynanchum*

Argel. As the latter are now known to be destitute of purgative power, and purely bitter, it would be interesting to ascertain the comparative potencies of pure senna, and of that mixed with cynanchum. Should it turn out that the admixture really effects an improvement of quality, we may perhaps, without great stretch of charity, ascribe the systematic admixture of the two leaves to a desire to improve the article. Cheapen it, it does not. It has been remarked with wonder by travellers, that the senna leaves are quite as easily obtainable as those of the plant used presumably for its sophistication.

Senna was invariably exhibited in a watery vehicle, and this is as it should be; strong spirit fails altogether to extract its active principle, notwithstanding Christison's statement to the contrary.

Among the more noteworthy examinations of senna of recent date are those of Robert Rau, of Bethlehem, Pennsylvania, and of Professor Dragendorf and Herr Kubly, of Dorpat.

Rau's results have since been disproved, but as his experiments present many points of interest I will shortly enumerate them. The paper will be found *in extenso* in the 'American Journal of Pharmacy' for 1866. He commences by asserting the inertness of the resin extracted from senna by the use of alcohol, and in that is perfectly correct.

The active principle being supposed still to remain in the residue of the operation, the senna is extracted next with cold water, and to the infusion diacetate of lead is added in excess. The filtrate from the precipitate thus formed is freed from lead by sulphuric acid, and being then evaporated, the sweet extract was found destitute of purgative action. He found the same inertness in that part of the extract soluble in spirit—the so-called cathartin of Lassaigne. The yellow lead precipitate was next examined. When dried and boiled with alcohol it yielded a substance of a deep yellow colour which was darkened by alkalies. It consisted of two resinous bodies, chrysoretin, etc. The residue suspended in water was decomposed with sulphuretted hydrogen, and furnished only a "*tasteless, gummy substance of acid reaction*," that seemed unworthy of further notice.

The dried sulphide boiled in alcohol yielded a resinous, very nauseous substance insoluble in water, soluble in alcohol and in ether.

The dried sulphide boiled in ether gave a crop of interlaced acicular crystals of dirty white colour, at first tasteless, afterwards persistently bitter and nauseous. Five grains purged actively five hours after taking. A second quantity of crystals was obtained from the liquid by treatment with animal charcoal, and boiling as before in ether. He claims for this substance the position so long usurped by the pretended senna Cathartin of Lassaigne and Fenuelle, and names it "Sennin."

The characteristics of this new "Sennin" are thus described:—It is insoluble in water, cold or hot, insoluble in acids, insoluble in alkalies, insoluble in cold alcohol; soluble, to some extent, in hot alcohol and in ether, but especially soluble in chloroform. All this being true, how on earth could the sennin have been induced to leave its nidus by the mere action of cold water? This consideration determined me on repeating the experiment, but fortunately I was saved the trouble by the announcement of Herr Kubly, who had carefully trodden the same path as Mr. Rau, but with greater discernment, that the "dirty-white interlaced acicular crystals" were in point of fact neither more nor less than sulphur. It must, however, be remembered to Mr. Rau's credit, that he gave the finishing blow to the pretensions of Lassaigne's Cathartin, and also proved the incorrectness of Martius' assertion respecting chrysophanic acid,—it exists in senna in very minute proportion only.

My own experiments were commenced in 1862, by an examination of the precipitate that so invariably collects at the bottom of old samples of Liquor Sennæ.

I found it to consist of phosphate and sulphate of lime combined with resinous acids, some of which were soluble in alcohol, some in ether, some only in alkaline solutions. The whole treated with liquor potassæ in considerable excess, dissolved, producing a rich brown colour. From the filtered solution hydrochloric acid precipitated the resins,—brown in colour when pulverulent, black when fused into masses. Eight grains of this substance taken for a dose produced no effect whatever on the bowels. As similar resinous acids were not precipitable from liquor sennæ by acids in the cold, I at once suspected that they derived their origin from the slow decomposition of an unstable glucoside. Another supposition that they were products of oxidation was negatived by the fact, that the precipitation occurred in perfectly closed vessels. An examination of liquor sennæ presented the following reactions:—It was acid to test-paper. When treated in the cold with weak hydrochloric acid it did not deposit anything material before ten or twelve hours had elapsed. Boiled with any mineral acid it deposited a considerable amount of dark resin, leaving the fluid nearly colourless. Comparative tests before and after boiling with acid, with Fehling's liquor showed that the proportion of glucose had been increased by that treatment. Neutral acetate of lead threw down an abundant pale precipitate. No precipitate of consequence was obtained by using either tannin, ammonia, or iodohydrargyrate of potash. Basic acetate of lead applied to the filtrate from the neutral acetate, produced an abundant orange precipitate, leaving the liquid to all appearance destitute of any active principle of senna. This lead precipitate, treated with cold dilute sulphuric acid, yielded a dark solution, that when boiled with a mineral acid yielded a resinous precipitate, and a disagreeable smell of stale senna. The lead was therefore in combination with the glucoside, for which I was in search. Guided by these results, my experiments were resumed on a larger scale.

A quart of Liquor Sennæ that within a fortnight of its preparation had commenced to deposit resin, was neutralized with ammonia. The precipitate obtained consisted mainly of phosphate of lime.

Neutral acetate of lead being added in excess to the filtrate a precipitate was obtained, consisting of certain organic acids in combination with oxide of lead. This precipitate washed, suspended in water, and decomposed by sulphuretted hydrogen furnished a brown acidulous liquid, which was decolorized to some extent by animal charcoal, and then neutralized with baryta water. Of the baryta compounds one part was soluble, the other not. The insoluble part was treated with sulphuric acid, which eliminated the organic acid. The soluble part was reprecipitated with acetate of lead, and decomposed with sulphuretted hydrogen. The acids thus obtained were compared in their reactions with the better known organic acids, but could not be identified.

As I was unable to devote to the subject sufficient time for complete examination, and the results were not likely to be of pharmaceutical interest, I handed it over to Dr. Attfield, with a request that he would put one of his senior pupils upon it, if he thought the subject worth following up. I thought it not unlikely that the inquiry might result in filling up some gap in a homologous series, and thus be of scientific interest. I understand that the subject is in the hands of the senior Bell Scholar.

The addition of diacetate of lead to filtrate No. 2, produced a copious orange precipitate, which, when washed and diffused through water, was decomposed with sulphuretted hydrogen. The brown acid liquid that resulted was warmed, neutralized with ammonia and evaporated to dryness; redissolved in water, spirit of wine was added till a precipitate began to form. This precipitate consisted of sulphate of ammonia, in small quantity. The liquid poured off from this was treated with a larger dose of spirit, when the greater part of the glucoside acid, combined with ammonia, fell to the bottom in a treacly mass. This

looked so little like an active principle, and was so perfectly devoid of taste or smell, that I at once jumped to the conclusion that it could not be the thing I wanted. I therefore passed it over, as did my forerunner, Mr. Rau, without administering one dose even, and prosecuted my research in the liquid, from which, in combination with lead, it had been precipitated. The results, however, were purely negative.

I then macerated 33 oz. of Alexandrian senna leaves (unpicked) with 5 pints of methylated spirit, and, at the end of ten days, pressed and filtered. The spirit, a little water being first added to the liquid, was evaporated, and the resinous oily substance removed carefully from the aqueous fluid it overlaid. It was apparently destitute of medicinal activity,—the bitterness of the tincture being concentrated in the fluid. Diacetate of lead added to this produced an orange precipitate of certain colouring matters, of no pharmaceutical importance. The filtrate, freed from lead, was still bitter, but became less so on evaporation. During the process a dark-coloured resin separated. From the strong solution a little rectified spirit precipitated sulphate of ammonia and other salts, and then, twice its volume of ether being added, a dark-coloured sweet extractive was thrown down. The filtrate after evaporation, etc., was a second time so treated, and a second crop of extractive obtained.

The ether-spirituous solution shaken with water, yielded to it a bitter substance of dark colour and not unpleasant flavour. In doses of 5 grains it had no effect whatever on the bowels. The extractive was also inoperative. The bitter was doubtless derived from the Cynanchum, of which it may be said to be the active principle.

The marc from which the spirituous tincture had been pressed was now exhausted with water, and, from the infusion, purified from the senna acids by acetate of lead, the glucoside acid was precipitated with diacetate of lead. This compound having been decomposed with sulphuretted hydrogen and ammonia added, the glucoside was precipitated in combination with ammonia by rectified spirit. It remained now as a last resource to try its medicinal effect; not with much hope of result, but still acknowledging the possibility of this tasteless and apparently inert substance being so modified in its course through the system (bearing in mind also that senna acts only indirectly on the bowels), as to enable it to produce the cathartic effect I desired to experience. On taking a dose of 5 grains, I was pleased to find that some disturbing effect was produced. A repetition of the experiment enabled me to decide that the glucoside was the active principle of senna. Flattering myself that I had made a discovery of something not hitherto announced, I proceeded to prepare the glucoside by precipitating it directly from a concentrated infusion of senna, in combination with the bases—lime, magnesia, and potash, with which it is naturally associated. I found that the first precipitate was much contaminated with the senna acids in combination with lime, and was of little virtue; the second precipitate was more active, and of this 4 grs. acted fairly as a purge.

Just at this time I became aware of the existence of the paper on senna by Dragendorf and Kubly. It was pointed out to me by our President, who kindly sent me a *résumé* of the work, translated from the German 'Quarterly Journal of Practical Pharmacy.' It was now evident that as to the facts I had laboriously discovered, I had been forestalled by the German professors. I therefore abstained from a minute examination of the glucoside, and devoted myself to attempting its preparation by a *cheap* and easy method adapted to the purposes of pharmacy. I must confess that my results hitherto have not been sufficiently good to warrant my enlarging at present upon my numerous experiments in that direction. I will give shortly, in conclusion, Dragendorf's results, adding a few remarks of my own on the pharmaceutical preparations of senna.

The glucoside acid, that now is known to confer on senna its purgative property, has been named by its discoverers Cathartic acid. Its formula has been stated as $C_{180}H_{96}N_2SO_{82}$, which, if true, accounts for its extreme instability. It is insoluble in water, strong alcohol, and ether, but enters readily into watery solution when combined with alkaline and earthy bases. Its ammonia salts give brownish flocculent precipitates with salts of silver, tin, mercury, copper, and lead. Antimonial salts, tannin, yellow and red prussiates, have no effect upon it. Alkalies, aided by heat, act destructively upon it; boiled with a mineral acid it splits into a peculiar kind of glucose and an acid that has been named Cathartogenic. Its formula is said to be $C_{132}H_{58}N_2SO_{44}$. Cathartic acid, in a combined state and of tolerable purity, is prepared by partially precipitating by strong spirit a watery infusion of senna, concentrated to a syrupy state by evaporation *in vacuo*. The filtrate is now treated with a much larger bulk of absolute alcohol, and the precipitate thus obtained is purified by repeated solution in water and precipitation by alcohol.

To obtain the pure acid, advantage is taken of its colloidal properties; the crude cathartate is dissolved in moderately strong hydrochloric acid, and subjected to dialysis on a diaphragm of parchment paper. The minimum dose of this pure acid was found to be about $1\frac{1}{2}$ grains, which caused several stools with decided griping.

The combinations of cathartic acid that I have made are, the cathartate of ammonia, prepared from cathartate of lead by my original process, and the mixed cathartates, prepared according to Dragendorf's method as modified by myself. Of the former nearly pure salt, I have found $3\frac{3}{4}$ grains to purge fairly as to amount, but slowly as to time, and with considerable griping. Of the latter, $7\frac{1}{2}$ grains purged violently with much griping and sickness, which continued through the greater part of the day, completely knocking the patient out of time; 4 grains would, I think, be a fair dose. It should, however, be given in conjunction with a saline and an aromatic corrective of some kind. With phosphate or potassio-tartrate of soda an agreeable and effective aperient might be formed; possibly the cathartate itself might be modified in its action by opium, belladonna, or hyoscyamus. I cannot affirm, however, that the active principle has a more unpleasant action than the raw drug, but such I should expect to be the case.

It obviously would be improper to combine senna with any of its metallic precipitants should such be desired, which is not likely. It is here satisfactory to observe that the cathartate of magnesia is soluble, and that the old-fashioned black draught agrees with new-fashioned science.

The effect of acids on senna must not be overlooked. The mineral acids precipitate, aided by heat they destroy, its active principle, as I have pointed out already. The organic acids precipitate it from its aqueous solution, but *do not* decompose it on boiling. Here then is a very important distinction, one that saves the credit of such preparations as the old Infusum Sennæ Limoniatum, Decoctum Tamarindorum cum Senna, and others of the class, not forgetting the much used Conf. Sennæ Co.

The long-continued action of heat on cathartates exposed to the air in watery solution, is to decompose them, rendering them inert. Decoctions and extracts of senna are therefore to be made with proper precautions, or preferably abandoned in favour of the recent and quickly-made infusion.

Fermentation either of the infusion, pure and simple, or of the infusion made into syrup with sugar, decomposes the glucoside most completely. I have been assured by a constant taker of Ess. Sennæ Dulc., that the latter part of the bottle of essence is never so active as the first. Particular care, therefore, should be taken to obviate fermentation. The best way to do so is to add to each fluid ounce of syrup two minims of chloroform dissolved in a little alcohol.

Chloroform will not only prevent fermentation, but will at once arrest it when in full swing. The fact is worth repeating, if already known.

As regards the relative values of Alexandrian and Tinivelly sennas, my experiments go to prove that the former yields half as much again of the active principle as does the latter.

I have made no experiments on the follicles of senna. They were preferred by Mesue. Pomet states that they are equally efficacious as the leaves, without partaking of their noisome flavour. Dodoens gives a very quaint and accurate summary of the whole therapeutical question, part of which I will, as a conclusion, venture to transcribe:—

"The coddes and leaves of sena are hoate in the seconde degree and drie in the first.

"The coddes and leaves of sena taken in the quantitie of a dram, do lose and purge the belly, scoure away fleme and choler, especially black choler and melancholie.

"The leaves of sena are good for people that are geven to be sadde, and pensive, dul, and feareful, and that are sodainely afrayd for litle or nothing. They are good agaynst all stoppinges of the liver, the splene, agaynst the paynes of the head, the scurffe, manginesse, itche, and lepzie. In fewe wordes, the purgation made with the leaves of sena, is good agaynst all diseases springing of melancholie, adust, and salt humours.

"The coddes, after the opinion of Mesue, are best to be used in medicine, and next the leaves, but the stalkes and branches are unprofitable. Sena provoketh windinesse and gripinges of the belly, and is of a very slacke operation. For a correction or remedie, you must put to sena annys seede, ginger, and some sal gemme, or you must boyl it with annys seede, raysons, and a little ginger; for being so prepared and drest, it maketh his operation quickly and without any greefe."

Mr. Deane stated that, according to his experience, the nearly colourless liquors, obtained in the final stages of percolating senna by means of water, had still great purgative properties.

The President pointed out the importance of the paper as indicating that alcohol was a bad menstruum for the active principle of senna, whilst water was evidently much better suited for the exhaustion of the drug. He was reminded that some years since, his firm had to dispense the prescriptions of a German physician for infusion of senna deprived of resin by alcohol. Now, according to the important results recorded by Mr. Groves, the purgative qualities of such an infusion would not be impaired by the preliminary treatment with alcohol.

Professor Attfield said that the Senior Bell Scholar in the laboratory of the Pharmaceutical Society was investigating the senna acids alluded to by the author of the paper, but the extreme heat of the present summer had so far increased the proneness to change exhibited by infusions of senna that the continuous prosecution of the inquiry was delayed.

Mr. Abraham quoted the late Mr. Duncan, of Edinburgh, as a high authority on the subject of senna, and he held the opinion that cold water should always be used for exhausting senna, because the results had not the griping qualities which resulted when hot water was employed. Mr. Abraham said that his own experience coincided with this view.

Mr. Groves, in his reply upon the discussion, stated his belief that the griping produced by senna depended upon the greater or less strength of the preparations used.

NOTES ON LEMON-JUICE AND ITS DECOMPOSITION.

BY W. W. STODDART, F.G.S.

The long-continued separation which a sailor afloat endures from all that is fresh and varied in his food, especially from that of a vegetable nature, has always been known to be productive of disease.

For many years the physician has known that the free use of fresh vegetables, or a sufficient quantity of the juice contained in the hesperidia of lemons (*Citrus Limonum*), or of limes (*Citrus Limetta*), will speedily ensure a cure of the unfortunate patient.

The two latter, from their easy preservation and portability, have been a *sine quâ non* with sailors,—so much so, that the marine authorities have ordered every ship to have in its stores a quantity proportionate to the crew. In this respect as in many others, poor Jack has been grossly victimized by the rascality of dishonest dealers; probably I should not be far from the mark, if I said that half the liquid sold as lemon or lime-juice has been a mineral rather than vegetable production. A modern author coolly informs us that an artificial solution of sulphuric acid is more agreeable to the nautical palate than the true juice!

As long ago as 1795, the Admiralty issued orders that ships should carry a supply of lime or lemon-juice, but ever since that time this well-meant regulation has been rendered null and void by the wretched trash that has been bought and sold. An immense quantity of lime and lemon-juice being required in the market, and the supply to a certain extent limited, the most abominable and fraudulent adulterations have cruelly been the rule instead of the exception, and many times a genuine sample could not be bought at any price. The Board of Trade, being aware of this, wisely resolved to pass, in the present year, "The Shipping Act."

This compels the mate of every foreign-going ship to provide so much lime or lemon-juice, that each man may have at least one ounce per diem, so soon as the vessel has been ten days at sea. That for forty men, 1 gallon should be kept; for sixty, 2 gallons, and so on. It goes on to summarily forbid every captain to take on board any lime or lemon-juice that has not been passed by an officer appointed by the Board for that purpose. It is to be tested for gum, sugar, citric acid, and general freedom from adulteration. It is to have a specific gravity of not less than 1·030, and not less than 30 grs. of citric acid per ounce, and to have a proper taste, colour, odour, and consistence. The consternation among the merchants holding large quantities of lemon-juice may easily be imagined, for although the Board of Trade had given considerable latitude in their requirements, yet hardly any in the market would stand the tests, and pass the examining officer. Not an ounce of genuine juice was to be bought in Liverpool, Birmingham, or Bristol.

This then being the case, naturally led to a great many analyses of samples from various quarters. The author was thus attracted to the present subject by the wide discrepancy between the result of his experiments, and the information published in our best books.

For instance, Pereira gives an analysis of lemon-juice by Proust, showing that it contained 1·77 per cent. of citric acid, or about 10 grains per ounce. The specific gravity is not mentioned. It is surprising that the statement should have been introduced into the last edition of that work. In our excellent 'British Pharmacopœia,' *freshly pressed* lemon-juice is said to have an average specific gravity of 1·039, and an average quantity of 32·5 grains of citric acid per ounce. These two do not agree; the specific gravity is too

great for the acid. In Muspratt's 'Dictionary,' juice containing seven per cent. or 31·5 grains per ounce, is termed very superior. In Mr. Watt's splendid work, 4·7 per cent. or 20½ grains per ounce is quoted as the amount. Muspratt says that lemons at an earlier part of the season are more acid, and as the season advances the water is a percentage or two higher. All these statements are so greatly at variance with the results I have found, that I am induced to bring the subject before the Conference.

As will be seen, the Board of Trade have fixed very liberally for the vendors the specific gravity of 1·030 as the standard, and 30 grains per ounce as the *least* quantity of acid.

On February 25th of this year I bought a lot of lemons from six different shops, and after mixing them, I pressed eight, which gave seven ounces of juice, having a specific gravity of from 1·040 to 1·046, and yielding 40 to 46 grains per ounce, or 9·6 per cent. of citric acid.

The specific gravity was taken by one of Griffin's hydrometers, as ordered by the Board.

	1	2	3	4	5	6	Average.
Crystallized Citric Acid . .	42·90	40·05	41·74	39·02	44·60	46·90	42·53
Gum and Sugar	3·45	2·39	3·03	2·96	3·67	3·64	3·19
Inorganic Salts	2·58	1·18	2·38	2·22	2·61	2·73	2·28
Total grains per ounce .	48·93	43·62	47·15	44·20	50·88	53·27	48·00
Specific gravities . . .	1·043	1·040	1·042	1·040	1·045	1·045	1·044

The remainder of the lemons was put aside till the end of May, and again examined. The result was thus :—

	1	2	3	4	5	6	Average.
Crystallized Citric Acid . .	40·90	39·65	39·66	36·38	43·93	45·77	41·04
Gum and Sugar	4·33	2·63	4·51	4·25	3·92	4·44	4·01
Inorganic Salts	2·58	1·18	2·38	2·22	2·61	2·73	2·28
Total grains per ounce .	47·81	43·46	46·55	42·85	50·46	52·94	47·33
Specific gravities . . .	1·041	1·039	1·040	1·038	1·044	1·044	1·041

It will therefore be observed, that as the lemons were kept, and the summer advanced, the quantity of acid decreased (at first slowly, but at length very rapidly) but the specific gravity only suffered comparatively slight diminution; the quantity of the juice also remained the same, for eight lemons yielded 7 ounces in May as in February.

On examining the remaining fruit in July the curious fact was ascertained, that although the specific gravity was 1·027, yet there was not a particle of citric acid. Analysis showed that it had all split up into glucose and carbonic acid.

Since this, the nitrogenous matter in the juice has again set the whole into fermentation. The glucose has produced alcohol, and the alcohol acetic acid, thus :—

$$\underset{\text{Glucose.}}{C_{12}H_{24}O_{12}} = 4\underset{\text{Alcohol.}}{(C_2H_6O)} + 4CO_2.$$

Then, after passing through the intermediate stage of aldehyde,

$$\underset{\text{Alcohol.}}{4(C_2H_6O)} + 8O = \underset{\text{Acetic Acid.}}{4(C_2H_4O_2)} + 4H_2O$$

This result you have before you on the table.

On examining a vessel containing a large quantity of lemon-juice, the peculiar earthy smell of carbonic acid is distinctly perceptible. For a clearer proof, a quantity of juice was put into a bottle which was connected by a glass tube with lime water, beneath which the glass tube dipped; all was hermetically sealed and laid aside, when the deposition of carbonate of calcium became sufficiently evident.

The decomposition would be explained thus:—

$$\underset{\text{Citric Acid.}}{3(C_6H_8O_7)} + 3O = \underset{\text{Glucose.}}{C_{12}H_{24}O_{12}} + \underset{\text{Carbonic Acid.}}{6CO_2}$$

This change is of course one example among many of the chemical transformations which take place in the maturation of fruits, and a striking one it is.

Freshly expressed lemon-juice is a thin, milky, slightly yellowish liquid, having a sp. g. from 1·040 to 1·045, and containing from 39 to 46 grains of citric acid per ounce. Should either of these be less, the lemons must have been kept too long or gathered too late in the season.

Liquor potassæ turns the juice a peculiar dark colour, well known to those accustomed to diabetic examinations.

When freshly pressed the smell is aromatic, but when kept for a few days acquires the mouldy flavour which the commercial juice usually possesses. Trommer's and Fehling's tests give a decided indication of glucose.

With polarized light the ray is turned to the right. Acetate of lead gives a muddy white precipitate (gummate of lead).

Chloride of barium, nitrate or acetate of potassium, or chloride of calcium should give no precipitate, indicating the absence of sulphuric, tartaric, or oxalic acids. The aroma of the pure juice is very peculiar, and differs as much from any artificial compound as rose-water distilled from the petals does from that made with otto.

The juice from limes is not so acid as that from lemons.

Through the kindness of a friend I obtained a dozen limes from Glasgow, from these I obtained $5\frac{1}{2}$ ounces of juice. This was very much more aromatic and more delicate in its flavour than lemon-juice. Its sp. g. was 1·037, and contained 32·22 grains per ounce. It was, therefore, not so strong as lemon-juice.

Messrs. Southall, of Birmingham, furnished a sample as coming from the Olveston plantation in Montserrat, which had a deep yellowish-brown colour; this, I presume, was given artificially, as that pressed by myself from the fruit was nearly colourless.

This coloration has since, however, been shown to have been accidental from the containing vessel.

A singular fact was communicated to me by D. Davis, Esq., Medical Inspector for Bristol, which was (at any rate, to me) quite new. Of course, all chemists are aware that when citric acid is *fused* with potassa it is decomposed into oxalic and acetic acids, thus:—

$$\underset{\text{Citric Acid.}}{C_6H_8O_7} + H_2O = \underset{\text{Oxalic Acid.}}{C_2H_2O_4} + \underset{\text{Acetic Acid.}}{C_2H_4O_2}.$$

But when liquor potassæ is mixed with common lemon-juice *in the cold*, oxalic acid may be detected in a few days.

When lemon-juice is carefully evaporated it yields a rich brown extract, which is very peculiar both in smell, taste, and appearance, so much so that any one accustomed to make these experiments can in one moment tell whether or not it is a genuine juice.

An ounce of lemon-juice will average 27 grains of dry extract per ounce. After a certain point the extract becomes carbonized, having a rich brown colour and pleasant smell. This is owing to its partial decomposition into acetone, carbon, carbonic acid, carbonic oxide, and aconitic or pyrocitric acid.

$$\underset{\text{Citric Acid.}}{2(C_6H_8O_7)} = \underset{\text{Acetone.}}{C_3H_6O} + 2CO_2 + CO + \underset{\text{Aconitic Acid.}}{C_6H_6O_6} + 2H_2O.$$

It seems quite impossible to evaporate the juice to dryness without decomposition.

During the first six months of the present year a great number of samples of commercial juice were examined; the following are a few of them procured from London, Bristol, Liverpool, Leith, Birmingham, Newport, Cardiff, Southampton, etc., besides samples obtained from wholesale and retail druggists and importers of foreign produce. Some were plainly artificial, a few contained sulphuric acid, but most of them were merely diluted with water. The greater number of those obtained from the retail shops were artificial, and in no single instance stronger than twenty-four grains per ounce.

The following table is the result of twenty of these analyses made of samples from the places before mentioned. They are calculated as grains per fluid ounce :—

No.	Citric Acid.	Gum and Sugar.	Sp. g.	Adulterant, and Remarks.
1	25	3·10	1·026	Watered.
2	30	3·90	1·032	Artificial.
3	20	2·00	1·021	Watered.
4	28	2·00	1·028	Watered.
5	35	5·80	1·037	Artificial and Cane Sugar.
6	14	2·00	1·023	Artificial and Tartaric Acid.
7	15	1·99	1·016	Watered.
8	18	3·00	1·019	Artificial.
9	19	9·00	1·027	Artificial.
10	42	3·45	1·043	Genuine.
11	28	2·85	1·029	Watered.
12	19	13·52	1·022	Artificial.
13	42·22	6·50	1·044	Genuine.
14	32·22	3·90	1·033	Genuine.
15	43·90	10·50	1·048	Genuine, but coloured with some extract.
16	29·5	2·90	1·030	Genuine, but reduced.
17	5·3	——	1·028	With Sulphuric Acid and Sugar.
18	40	3·60	1·042	Genuine.
19	32	3·44	1·033	Genuine.
20	30	1·59	1·030	Artificial.

Thus, it will be seen, that in no article was adulteration carried on to a greater extent than lemon-juice, and prior to the present Act a genuine sample was hardly ever obtainable.

The juice keeps its strength better separated from the fruit than in it. A good sample may be kept for years without sensible diminution of its acid, especially if fortified with spirit.

The cell-structure of the fruit seems to be the chief source of the fermen-

tative matter, especially that part of the mesocarp that forms what is commonly called the white of the rind.

The ingredient in the juice, which is the therapeutic agent, seems to be a matter of dispute among medical men. Those who advocate Dr. Garrod's views—that it resides in the potash—must have a homœopathic idea of its value, and plenty of faith.

The analyses of many specimens of ash show only $\frac{3}{10}$ grain of potash per ounce. Others, with Dr. Tanner, and I think with more reason, rely on the citric acid as the chief means for curing scurvy.

The molecules of citric acid are very remarkable for their tendency to change, especially when sugar or gum is present. As remarked before with regard to lemon-juice, so a solution of crystallized citric acid cannot be evaporated to dryness without decomposition, even with a very gentle heat.

Like all seaport towns, a great many cases of scurvy are present in Bristol, and I have the authority of several of our leading physicians for saying that they find the crystallized citric acid as efficacious as lemon-juice (especially with fresh meat and vegetables) in curing that disease.

But as this question is more in the sphere of the physician than the pharmaceutist, it had better be left in their hands for solution.

Mr. H. S. Evans said, with reference to the alleged extensive adulteration of lemon-juice, that he knew there were at least two firms in Liverpool who imported this article direct from Messina. Upon its arrival this juice could not pass the inspectors unless having 7 per cent. citric acid and 5 per cent. alcohol. He had a good deal of experience in the examination of such imported juice, and had always found from 7·5 to 9 per cent. of citric acid and 4 to 5 per cent. of alcohol. But there could be no doubt that great adulteration was practised, and the Act had done much good by putting a check upon this. With regard to the case in which citric acid was said to have been used for fortifying weak lemon-juice, he (Mr. Evans) was disposed to query whether a scarcity of lemon-juice might not only justify such a procedure, but render it necessary.

The President confessed to have been much struck by the facts brought forward by Mr. Stoddart to show that lemon-juice might contain no free citric acid. He considered that lemon-juice freshly squeezed was the only sort that should be used in pharmacy. The lemon-tree was a singular instance of a tree bearing fruit at all seasons of the year, its inflorescence proceeding simultaneously.

Mr. Deane reported his own procedure to be the following:—He laid in a stock of lemons when plentiful in spring, squeezed the juice, heated it to 180° F., and bottled it whilst hot in small bottles, that were then tied over with bladder. In this way the juice kept good for many months.

Mr. Schacht remarked upon the extreme interest of the question raised by the disappearance of the citric acid. What had become of this?

Mr. F. C. Clayton gave some interesting particulars derived from an extensive acquaintance with the commercial aspects of the question. He said that the Board of Trade allow lemon-juice having a specific gravity of 1·003, whilst pure juice should be 1·004. A change of practice had lately occurred as to the addition of spirit, for, as white rum (which was formerly used) caused the juice to turn to a dark greenish-yellow, it was now omitted. With reference to the kindred subject of lime-juice, he had usually found this to have a density of 1·0048, and to give 11 ounces of citric acid per gallon. The practice now obtained of importing lime-juice in a concentrated state, having a density of 1·024. To test the effect of heat, he had evaporated 20 ounces of lime-juice to 2 ounces, then re-diluted, and found the density not to have changed.

Professor Attfield thought that the disappearance of citric acid in the manner suggested, namely, by conversion into glucose and other bodies, was to be regarded as one of the most important of Mr. Stoddart's observations, and demanded further attention. Referring to the therapeutic question, he trusted that members of the medical profession would institute experiments to decide whether the citric acid was the efficient agent, or the salts of potassium.

Mr. Groves said that the fruiterers recognized what they called "sweet lemons.'

Could it be that Mr. Stoddart had met with some of these? As to the preservation of lemon-juice throughout the year, he was well satisfied with a plan which he had long adopted, viz. adding two minims of chloroform to a fluid ounce of juice. When the juice was required for use, warmth was applied and the chloroform evaporated.

Mr. W. L. Scott stated that he had found acid oxalate of potash in lemon-juice in two instances, the amounts being 4 and 7½ per cent. respectively.

Mr. W. R. King, Mr. Searby, Mr. Caley, and Mr. Abraham also took part in the discussion.

Mr. Stoddart replied upon the whole debate. He said that the lemons which gave no citric acid had all the appearances of being perfectly sound. He was aware that in Italy there were "sweet lemons," of which both the peel and the juice were eaten. As to what became of the citric acid, he found that collaterally with its diminution there was an increase in the amount of sugar. That carbonic acid was also formed and eliminated through the rind of the fruit, he had proved by means of an air-pump and lime-water. He had never met with oxalic acid in lemon-juice. The difficulty in which they were placed could not be got over by squeezing the juice freshly at all seasons, for towards the summer months such juice did not contain the citric acid they required.

After an interval business was resumed at 2 P.M.

Mr. H. S. Evans proposed the following members as a Committee to report upon the Exhibition of Objects relating to Pharmacy, viz.:—The President, Messrs. Brough, Caley, Carteighe, Ince, Sutton, and Schacht.

Mr. Cubitt seconded the motion, which was carried.

WHAT IS OPIUM?

BY DR. F. A. FLÜCKIGER, OF BERN.

This question, in our days, will certainly be looked at as perfectly idle, both by practical pharmaceutists and by chemists. The drug indeed is well known, and has been universally used since the earliest time, in fact for twenty centuries at least; while to no other product of the vegetable kingdom has so astonishing an amount of excellent chemical research been devoted since the days of that glorious discovery of a modest Hanoverian *Apotheker*, who the first evolved the idea, that there are bodies existing which are thoroughly analogous to ammonia or potash, yet composed of organic elements. Every one looking over the rich chemical literature of opium published from the time of Sertürner (1816) to the recent delicate investigations of Smith of Edinburgh or Hesse of Stuttgart, may well be satisfied with a mass of analytical facts so interesting, useful, and complete. The present text-books indeed display a very satisfactory knowledge of this important drug, albeit they leave a little doubt regarding some of its numerous constituents.

Yet, I venture to say, that science is far from having an exact idea of the nature of opium. The endeavours of so many eminent chemists having failed to supply a thorough acquaintance with the drug, I cannot hope to fill up at once this defect, but merely wish to make it evident, and to contribute some facts concerning the composition of opium, which have escaped the attention of former investigators.

Opium contains a dozen of more or less decidedly alkaline bodies, among which morphine and narcotine occur in the largest proportion. The former constitutes very rarely more than 20 per cent. of the dried drug and usually not more than 12 to 15 per cent.; the narcotine on an average about 5 to 6 per cent.* The whole of the other alkaloids, namely pseudomorphine, co-

* I had the opportunity of examining a German opium from Biltz, Erfurt, which yielded 11 per cent. of narcotine.

deïna, thebaïne, papaverine, rhœadine, narceïne, kryptopine, and opianine, may be estimated at not more than 1 per cent. Thus the alkaloids amount at best to only $\frac{1}{4}$ of the weight of the dried juice; and meconic and thebolactic acid, and meconine to nearly $5\frac{1}{2}$ per cent. We may say, in fact, that allowing for the considerable discrepancies existing in the composition of opium, all the peculiar bodies found in it do not exceed one-third of its weight.

Now, what is the bulk of the remaining 66 per cent.?—However interesting, however important, both practically and scientifically, the first one-third may be, yet to have *a satisfactory idea of opium*, we require also to know exactly the nature of the other two-thirds. Most of the analyses of opium enumerate, in order to explain its composition, several very doubtful bodies besides the above-named principles. Among these, extractive, mucilaginous, and colouring matters occupy the first place. By successively treating with various liquids small quantities of opium, which alone admit of absolute exhaustion, we may separate its constituents into several portions. For the following assays I took a good Turkish opium containing 10 per cent. of morphine, which I finely powdered and entirely deprived of water. The first agent to which it was submitted, was benzol. After the action of this liquid the powder was dried, without removing it from the funnel, weighed and then exhausted in the same filter with absolute alcohol. When it yielded nothing more to alcohol, the powder was dried and weighed again as above, and then exhausted with cold and hot water, with acetic acid, and with ammonia. Lastly the residue was examined microscopically. It consisted of fragments of the poppy capsule, which now had become very obvious.

The benzol solution on evaporation yielded the narcotine and caoutchouc, which may be separated by acetic acid. Fatty matters occur, but only in slight traces.

Alcohol takes up the largest bulk; nearly all the bodies enumerated at the outset as peculiar to opium* are contained in the alcoholic tincture, and besides them sugar, a very small quantity of resin, and colouring matters. This portion of opium, representing the largest part of it, appears certainly to deserve the most attentive examination. I am sorry to state that I have not yet succeeded in isolating from it any new principle in a state of sufficient purity. The colouring matter for instance is extremely alterable.

Water dissolves chiefly *mucilage* from powdered opium, which has been previously exhausted by benzol and alcohol. The mucilage is precipitated by neutral acetate of lead, but not by silicate of soda; I have *not found in opium any gum analogous to gum arabic*. This fact, if confirmed by the examination of large quantities of good commercial opium, would enable one to say, that any opium containing gum must necessarily be adulterated.

After the action of the water, acetic acid removes some salts and a little colouring matter, all in small proportion.

Finally, ammonia acts very manifestly upon the residue of the preceding operations. The powder swells and yields a brown liquid, which being viscid cannot easily be filtered. On the addition of an acid, of alcohol or even of chloride of sodium, a thick jelly at once separates. The *pectic acid*, thus obtained, has not yet been found by other observers, as far as I can see, though I think that it must henceforth be considered as one of the regular constituents of opium. I met with it in several sorts of the drug which happened to be at my disposal and likewise in a good standard opium from Asia Minor, for which I am indebted to Mr. E. Merck, of Darmstadt, who furnished me with the residues of the drug, which had been previously exhausted by hot water and by hydrochloric acid. It would be interesting

* Narcotine only excepted, as it has been met with in aconite tubers by Messrs. Smith.

to examine in this respect the various Indian opiums, which I presume to be of a somewhat different composition. From all the various reports on them, it appears that the Indian juice is more fluid than that collected in Asia Minor. Does this partly depend upon the absence of pectic acid or of mucilage? This investigation must be expected from chemists having at their command considerable quantities of the residues of genuine opiums; they may state, whether I am correct in saying, that a pectic body must have a place among the normal constituents of the poppy juice.

After the treatment of the opium with ammonia, water is without any action upon the residue, which does not even swell; I consequently cannot agree with those chemists who admit *bassorine* as one of the principles of opium.

Examined under the microscope, the opium powder thus deprived of all soluble matters, shows very distinctly that it consists now exclusively of fragments of the capsule, which by incineration yield some ash, but not the whole amount of it, the inorganic salts having been already partly removed by alcohol, water and acetic acid. Among them a comparatively large proportion of alkaline sulphates, as well as of sulphate of lime is always met with. Sulphuric acid is set at liberty, if the precipitate obtained by neutral acetate of lead is decomposed by sulphuretted hydrogen in an alcoholic solution, which causes the mucilage to be precipitated.

In the manner indicated I completely exhausted 10 grammes of good Turkish opium successively with the above liquids, devoting about a week to this task. The results will, I hope, clearly show, which direction should be followed, in order to promote our knowledge of opium. It is that part extracted by alcohol, which contains the constituents not yet known, and upon which further researches, which I hope to institute, may probably throw some light.

The following numbers, calculated for 100 parts, were obtained. The opium yielded—

To benzol . .	10·83 =	4·50 narcotine and 6·33 caoutchouc, with traces of fatty matter.
,, alcohol . .	57·67	representing about 20 per cent. OF UNKNOWN BODIES.
,, water . .	9·67	of mucilage.
,, acetic acid .	1·73	salts, a little pectic acid and colouring matter.
,, ammonia .	7·33	pectic acid, reddening litmus.
By incineration	10·38	per cent. were burnt (cellulose), leaving
	2·39	ash; the whole amount of the ash in the drug under examination being equal to 5·32 per cent., when it was directly burnt.
	100·00	

I have observed that the pectic acid is not obtained immediately in a pure state; it appears to be always accompanied by some of the so-called humic bodies. Yet by dissolving it again in ammonia and precipitating by alcohol, it at last becomes nearly colourless and devoid of inorganic matter. It is always very difficult to powder; when heated, it evolves acid vapours, but in a less pure state it retains some albuminous matter yielding then ammoniacal vapours.

The purified pectic acid, when thoroughly boiled with water, partly forms a jelly, which at first is almost imperceptible, being perfectly colourless and transparent. Neutral acetate of lead somewhat thickens it, without any turbid appearance; an abundant precipitation takes place only on addition of ammonia.

The properties of pectic matters are known to be liable to some change; I found, that sometimes the pectic acid is not immediately separated from the ammoniacal solution on addition of acetic acid, but requires the addition of alcohol.

I was curious to know, whether pectin must be considered a constituent of the juice of the actual poppy-head or the capsule itself. An assay made with nearly ripe capsules showed that they do not contain any pectin—at least I could not obtain it in the same way as I did from opium. A very considerable proportion of pectin however (22 per cent.) has been found in poppy *seeds* by *Sacc.**

Mr. J. D. Smith called attention to a very interesting specimen of English opium, collected about twenty years since by Sir Roger Martin, at Burnham Westgate, in Norfolk. Mr. Spencer, chemist, had kindly sent this for inspection. It was a mass weighing some pounds, and excited much admiration of its apparently excellent quality.

NOTE ON NARCOTINE AND PRODUCTS OF ITS DECOMPOSITION.

BY J. C. BROUGH, F.C.S.

The object of the present note is to indicate the line of research pursued by Dr. A. Matthiessen, F.R.S., and Professor G. C. Foster, B.A., in their successful attempts to elucidate the chemical constitution of the important alkaloid narcotine. Through the kindness of my friend Dr. Matthiessen, you have now an opportunity of examining specimens of the principal products of the decomposition of narcotine; and I have much pleasure in informing you that the elaborate investigation which these specimens illustrate has been sustained by the liberality of Messrs. J. F. Macfarlane and Co., of Edinburgh, who have furnished the greater portion of the narcotine operated upon.

Since 1803, the date of its discovery by Derosne, narcotine has been the subject of many investigations, and in 1844 Blyth proposed for it a formula corresponding to the modern expression $C_{23}H_{25}NO_7$. This formula was generally accepted until 1863, when the analyses of six samples of narcotine from different kinds of opium led Matthiessen and Foster to adopt the formula $C_{22}H_{23}NO_7$ as that which most correctly expressed the composition of the body analysed. The adoption of this formula necessitated a revision of the received formula of *opianic acid* and *cotarnine*, the two bodies into which narcotine is resolved under the influence of oxidizing agents. The results of this revision were a fresh confirmation of the accepted formula of opianic acid, $C_{10}H_{10}O_5$, and the adoption of the modified formula $C_{12}H_{13}NO_3$ for cotarnine. The action of oxidizing agents on narcotine may accordingly be represented by the following simple equation:—

$$\underset{\text{Narcotine.}}{C_{22}H_{23}NO_7} + O = \underset{\text{Opianic Acid.}}{C_{10}H_{10}O_5} + \underset{\text{Cotarnine.}}{C_{12}H_{13}NO_3}.$$

Having devised a good process for transforming narcotine into opianic acid and cotarnine, the investigators proceeded to study the action of various reagents on these derivatives. On heating opianic acid with strong hydrochloric acid or with fuming hydriodic acid in sealed tubes, the opianic acid

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* 'Annales de Chimie et de Physique,' xxvii. (1850) 473.

was decomposed with evolution of chloride or iodide of methyl, and a new crystalline acid, having the formula $C_9H_8O_5$, was produced. This acid has been named *methyl-normal opianic acid*, on the supposition that it is a methylized derivative of a hitherto unknown normal opianic acid, while the ordinary acid is a dimethylized derivative of the same compound. Thus, we have—

Dimethyl-normal opianic acid (*Ordinary opianic acid*)	$C_{10}H_{10}O_5$
Methyl-normal opianic acid	$C_9H_8O_5$
Normal opianic acid	$C_8H_6O_5$.

By mixing ordinary opianic acid with a large access of potash-ley, and evaporating the liquid nearly to dryness, *meconin* and *hemipinic acid* were produced. This decomposition, in effect, is simply a rearrangement of the constituents of opianic acid, and may be thus represented :—

$$\underset{\text{Opianic Acid.}}{2C_{10}H_{10}O_5} = \underset{\text{Meconin.}}{C_{10}H_{10}O_4} + \underset{\text{Hemipinic Acid.}}{C_{10}H_{10}O_6}.$$

There is reason, however, for supposing that water takes part in the transformation, and that one of the primary products is a hypothetical hydrate of meconin, $C_{10}H_{12}O_5$, which, by the subsequent loss of the elements of water, is converted into meconin. The transformation of opianic acid into meconin was also effected by the deoxidizing action of nascent hydrogen.

Having thus ascertained that the simple relation subsisting between the formulæ of opianic acid, meconin, and hemipinic acid indicated the intimate chemical connection of the bodies themselves, the chemists endeavoured to arrive at a knowledge of the constitution of opianic acid by experimenting on the other two members of the group. They found that when meconin was subjected to the action of hydrochloric or hydriodic acid in sealed tubes it was resolved into chloride or iodide of methyl, and a new compound having the formula $C_9H_8O_4$. To this compound they have given the name *methyl-normal meconin*, on the supposition that it is derived from a hypothetical normal meconin, $C_8H_6O_4$, by the substitution of methyl, CH_3, for hydrogen. According to this view, ordinary meconin is a dimethylized derivative of the normal compound. Thus, we have—

Dimethyl-normal meconin (*Ordinary meconin*)	$C_{10}H_{10}O_4$
Methyl-normal meconin	$C_9H_8O_4$
Normal meconin	$C_8H_6O_4$.

On boiling hemipinic acid with concentrated hydriodic acid the former was decomposed into carbonic anhydride, iodide of methyl, and a new crystalline acid having the formula $C_7H_6O_4$. This acid has been provisionally named *hypogallic acid*, in order to recall the fact that it contains one atom of oxygen less than gallic acid. The following equation represents the reaction by which this compound is produced :—

$$\underset{\text{Hemipinic Acid.}}{C_{10}H_{10}O_6} + 2HI = \underset{\text{Hypogallic Acid.}}{C_7H_6O_4} + 2CH_3I + CO_2.$$

From the fact that two atoms of methyl derived from the hemipinic acid appeared in combination with iodine, the investigators inferred that ordinary hemipinic acid resembled ordinary opianic acid, or ordinary meconin, in being a dimethylized derivative of a normal compound hitherto unknown. On substituting strong hydrochloric acid for the hydriodic acid, only one atom of methyl from the hemipinic acid combined with chlorine; and in place of hypogallic acid a *methyl-hypogallic acid* was obtained. The reaction may be thus expressed :—

$$\underset{\text{Hemipinic Acid.}}{C_{10}H_{10}O_6} + HCl = \underset{\text{Methyl-hypogallic Acid.}}{C_8H_8O_4} + CH_3Cl + CO_2.$$

By the action of reagents on cotarnine, $C_{12}H_{13}NO_3$, Matthiessen and Foster have obtained a new acid, *cotarnic acid*, $C_{11}H_{12}O_5$, and other products which have not yet been thoroughly studied. The results of their experiments prove that cotarnine is a monomethylized compound, and consequently point to a normal cotarnine, $C_{11}H_{11}NO_3$, which has not yet been isolated.

The next step in this elaborate investigation was the examination of the decompositions of narcotine itself. When narcotine was heated for some time with hydrochloric acid in a flask under a layer of paraffin, a new base was obtained. This base was found to have the composition expressed by the formula $C_{20}H_{19}NO_7$, and was evidently formed from the narcotine by the substitution of two atoms of hydrogen for two atoms of methyl. It was named *methyl-normal narcotine* for reasons which will presently be obvious. On continuing the research alone Dr. Matthiessen observed that, when narcotine was heated with hydrochloric acid for a short time only, one atom of methyl was displaced by hydrogen; and, further, that when narcotine was heated with fuming hydriodic acid, three atoms of methyl were displaced by three atoms of hydrogen. The two new bases thus produced were named respectively *dimethyl-normal narcotine* and *normal narcotine*. We have therefore four narcotines constituting a homologous series, thus :—

Trimethyl-normal narcotine (*Ordinary narcotine*) . . .	$C_{22}H_{23}NO_7$
Dimethyl-normal narcotine . . .	$C_{21}H_{21}NO_7$
Methyl-normal narcotine	$C_{20}H_{19}NO_7$
Normal narcotine	$C_{19}H_{17}NO_7$.

The three new bases are amorphous, and do not form crystalline compounds. In working with them Dr. Matthiessen experienced no ill effects; and, by taking grain doses, he was led to conclude that they have no marked physiological action.

A recent observation made by this chemist, in conjunction with Mr. Wright, is specially noteworthy, as it explains the origin of meconin in opium extracts. By the action of water on narcotine at an elevated temperature, the base splits up into meconin and cotarnine, thus :—

$$\underset{\text{Narcotine.}}{C_{22}H_{23}NO_7} = \underset{\text{Meconin.}}{C_{10}H_{10}O_4} + \underset{\text{Cotarnine.}}{C_{12}H_{13}NO_3}.$$

This interesting discovery confirms the probable supposition that some of the numerous bodies which are named in analyses of opium are not actual educts, but merely products of decomposition.

The investigation which I have ventured to bring under your notice is not directly connected with pharmacy, but, as its results greatly extend our knowledge of the constitution of the earliest-known opium alkaloid, I trust that I have not occupied your time in vain. The fact that we are greatly indebted to the Messrs. Macfarlane for this extension of our knowledge deserves to be recorded in the proceedings of the Conference.

[This note is based upon two papers published in the 'Philosophical Transactions.']

Professor ATTFIELD, commenting upon Mr. Brough's description of Dr. Matthiessen's observations, said that he regarded his statements as involving an important discovery. It ought to remind them that in their chemistry they were dealing with matter under one particular set of circumstances. For example, they worked upon crude substances by means of water, and they possibly got as a result only certain products of the action

of water upon those substances. They considered these products as having been in the original material; but in this they might be mistaken. Again, the chemistry of the present day consisted of observations of the action and reaction of one body upon the other within a limited range of temperature. For instance, we knew that hydrogen and oxygen when lighted gave water; but that at a higher temperature the two united less easily; while, on the application of a still higher degree of heat, water decomposed and gave hydrogen and oxygen. These experiments should serve to remind us that we were dealing with natural facts only under a set of circumstances, and that the chemistry of matter under different circumstances might be another thing altogether.

Some discussion upon the nomenclature adopted took place.

Mr. BRADY remarked that he was glad to find the paper explained certain discrepancies about meconine, since no two authors agreed upon the quantity of this principle present in opium. He also alluded to the method adopted by Mr. Deane and himself when engaged upon the micro-chemical investigation of opium. By way of checking their results, they prepared synthetically factitious opium.

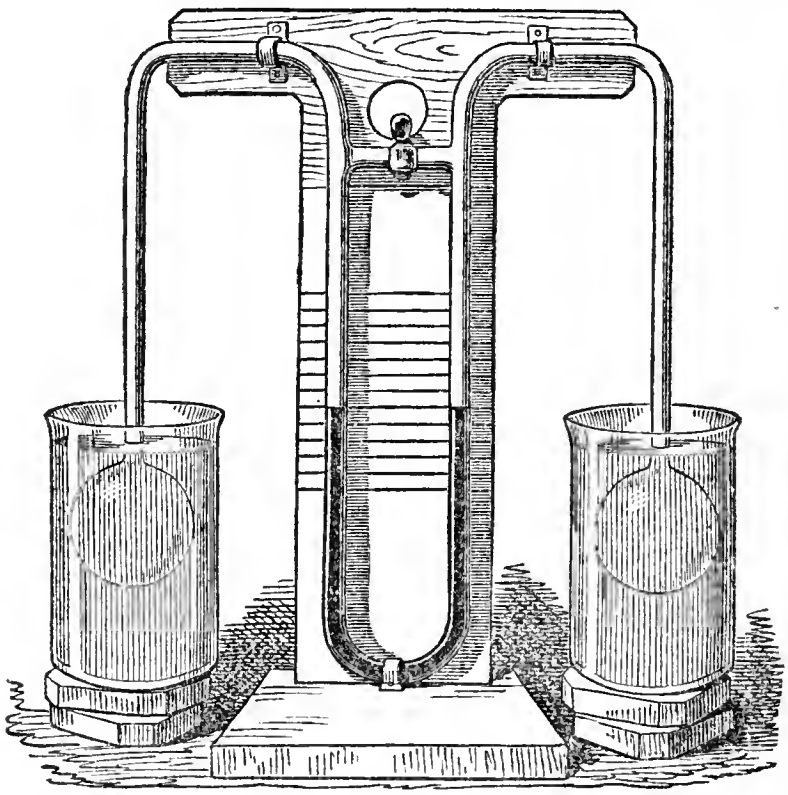
The PRESIDENT took cognizance of Dr. Flückiger's statement that he found 20 per cent. or more of morphia, a quantity which was much larger than the makers of morphia were willing to admit as attainable.

Mr. DEANE had rarely found so much as 20 per cent. of morphia. He thought that some standard of strength should be adopted for opium, and would suggest that none containing less than 10 per cent. ought to be used for making the tincture.

NOTE ON AN IMPROVED DIFFERENTIAL THERMOMETER.

BY J. C. BROUGH, F.C.S.

As many members of the British Pharmaceutical Conference are connected with local scientific associations, I may be excused for calling attention to Dr. Matthiessen's ingenious modification of Leslie's Differential Thermometer,



which is now employed by our leading chemists and physicists as a means of illustrating experimentally in the lecture-room many fundamental points relating to heat. The bulbs in this instrument are pendent, and can therefore be readily immersed in water; whereas in the ordinary differential ther-

mometer they form the terminations of the upright limbs of a tube bent twice at right angles. The old form is unsuitable for a great number of experiments to which the new one is specially applicable. The stop-cock connecting the two limbs of the tube is obviously a very valuable addition to the instrument, as by its aid the level of the coloured liquid can be immediately adjusted. With the ordinary differential thermometer this adjustment is a constant source of trouble. The instrument is well adapted for showing the differences in the specific heats of the metals. Thus, let equal weights of lead and zinc which have been raised to the temperature of 100° C. by immersion in boiling water be cooled in equal bulks of cold water contained in two similar vessels; then, on placing the bulbs of the thermometer in the vessels, the difference between the temperatures produced will be immediately indicated by a disturbance of the level of the coloured liquid. But if the two weights, instead of being equal, be proportionate to the atomic weights of the metals, the equal bulks of water will be equally heated, and the coloured liquid will remain at rest. For demonstrating the cooling and heating effects of the solution and crystallization of salts; the elevation of the boiling-point of water on addition of soluble substances; the unvarying temperature of the vapour produced before and after such addition, and many other results of a similar character,—this instrument will be found to possess advantages over the thermo-pile usually employed, on account of the little trouble attending its manipulation, and also because its indications are very distinct and easy of explanation. The instrument exhibited was constructed by Cetti, of London. The internal diameter of the bulbs is 55 millimetres, and that of the connecting tube 5 millimetres.

NOTE ON DEFECTIVE SAMPLES OF POTASH AND SODA-WATER.

BY B. S. PROCTOR.

At the Nottingham meeting of the Conference I drew attention to several faulty samples of potash water which I had met with; and, as I have again met with equally faulty specimens in a lot which was sent as a sample hamper, I think it desirable to draw the attention of the Conference to the subject, both as a caution to the members, and with the hope that my occasional jottings may stimulate the production of the report on the mineral waters of commerce, which has been promised for some time past.

Soda-water.—A bottle, professing to contain 10 grains of bicarbonate, yielded, on evaporation, a residue weighing 4 grains, consisting of bicarbonate of soda with lime and organic matter, the latter being sufficient to give the residue a decided brown colour.

Potash-water.—The residue of a bottle weighed only 0·4 grain, and consisted of carbonate of soda, potash, and lime, and organic matter, the potash being present in only very small quantity. The pressure of gas was satisfactory in both cases.

It is an indication of a very unsatisfactory state of the aerated water trade that of five samples, examined at different times, not one proved to be what it ought to be,—and only two of the five were such as I had reason to suspect were at fault before the examination was made. In more cases than one I should have expected the name of the maker a guarantee of good quality.

Mr. Carteighe thought that the absence of soda from "soda-water" was a generally understood fact.

Mr. Groves had met with soda-water containing ten grains of soda in a bottle. The

French name "eau gazeuse" was a much better one to apply to the beverage that did not contain an appreciable quantity of the alkali.

Mr. ATHERTON named having found about five grains of soda per bottle.

Mr. INCE insisted strongly that the soda-water of science and of commerce were two different things, and it was useless to attempt to reconcile them. The public got what they wanted in the soda-water of commerce.

Mr. J. D. SMITH said it would be highly interesting if soda-water manufacturers would let the public know what soda-water contains.

Mr. A. J. CALEY said that four years ago they manufactured soda-water with fifteen grains of soda per bottle, and people complained and said, "What is the matter with this soda-water—it tastes like soap." They then decreased the quantity of soda, and in proportion as they did so their trade increased. He could not state the exact quantity now dissolved, but perhaps it was the fraction of a grain. He thought it very desirable that people should not be supplied with soda-water with fifteen grains of soda in it, which he hinted might not be conducive to health. If a prescription, however, were ordered by a physician soda-water of a definite strength would be supplied.

Mr. GUYER objected to the assumption that no soda was present in soda-water. He knew large makers who asserted that they used ten grains per bottle.

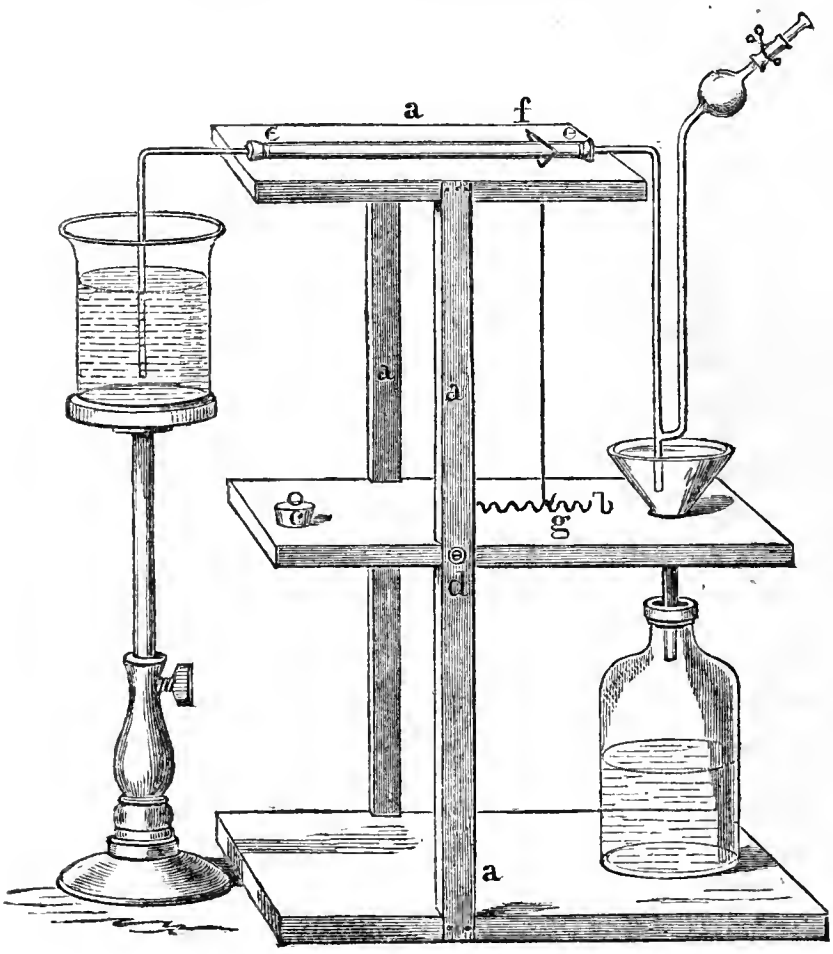
Professor ATTFIELD said that another paper on the same subject would have been presented but for the illness of the member who had undertaken the investigation.

DESCRIPTION OF AN AUTOMATIC ARRANGEMENT FOR CONTINUOUS FILTRATION AND WASHING PRECIPITATES.

BY HENRY B. BRADY.

[A working model of the apparatus was exhibited, and an extempore description was given, of which the following is a summary. As the arrangement requires modification for the two distinct operations for which it is designed, it will be necessary to give a separate description of each form. Woodcuts No. 1 and No. 2 illustrate the subject.]

Continuous Filtration (Fig. 1).

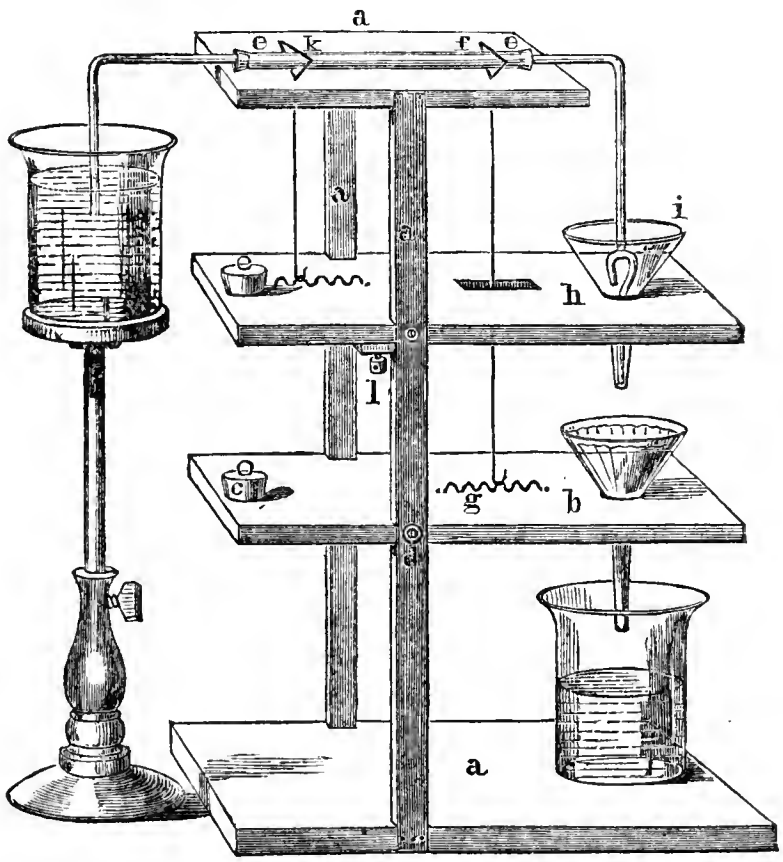


The arrangement for continuous filtration is exceedingly simple. The object is *to keep a filter constantly filled to a certain height.* The rigid stand, *a a a a*, consisting of two horizontal boards connected by two uprights, may be replaced by any convenient laboratory fittings, its object being to carry a funnel-holder, *b*, which swings freely on a pivot, *d*. One arm holds the funnel, the other is balanced by a suitable weight, *c*. A vulcanized india-rubber tube, *e e*, and a wire stirrup, *f*, are the only other essential portions of the arrangement. The stirrup encircles the flexible pipe, and, passing through the upper board, is connected with the arm which holds the funnel. A wire rack, *g*, is added as a convenient means of regulating the pressure of the stirrup.

It is obvious that if the counterpoise on the centre board is adjusted so that the weight of the filter when filled to the height desired will turn the scale, the pressure of the stirrup on the india-rubber tube will immediately cut off the supply. In practice it is found that the supply very soon adjusts itself exactly to the rate of filtration, and then the funnel remains stationary.

The fluid may be supplied in many ways; a common washing-bottle answers very well, or a tap-jar may be employed, or any other similarly convenient appliance. The drawing shows a somewhat more complicated arrangement, in which the supply is brought from an open beaker by means of a siphon, in which case the suction-pipe must be kept closed by a pinchcock.

Washing Precipitates (Fig. 2).



Object, to provide an *intermittent* supply of fluid in such a way that the filter shall empty itself completely before it is filled again. The same rigid stand, and the same oscillating funnel-board are used, but there is superadded another board like *b*, suspended in the same manner a little above it, as seen at *h*. This intermediate member holds a funnel, *i*, fitted with a Tantalus siphon, immediately above the funnel used for filtering, and has a wire and stirrup, *k*, working from the opposite end. Both stirrups being raised to

commence the operation, the upper funnel is filled as high as the top of the Tantalus siphon, and thereupon discharges itself into the filter. The filter, then, with the weight thrown upon it, turns the scale and cuts off the supply, just as in the simpler apparatus. It will be seen that if the stirrup, *k*, completely closed the elastic tube on the emptying of the upper funnel the operation would come to a standstill after the first delivery; and to avoid this a small screw, *l*, is introduced to prevent the weighted end of the board swinging back to its full extent, so that when the filter is emptied and opens the tube at *f*, a slow stream commences to pour into the funnel, *i*, increasing in rapidity as the augmented weight raises the wire at *k*.

It is scarcely necessary to explain the principle of the Tantalus siphon—a contrivance familiar to many as the basis of a philosophical toy. It consists of a bent tube like a U, with one arm longer than the other. The longer arm is fitted into the tube of a funnel by means of an india-rubber washer. Its siphon action is brought into play directly the fluid in the funnel has risen above the level of the top of the bend, and it then draws off the contents as far as its shorter arm reaches. The figures will explain the rest.

The application of the principle to the large filters used for manufacturing purposes will naturally suggest itself, and though the model exhibited was made for operations on a small scale, there is no reason that modifications to suit any variety of circumstances should not be introduced.

The simpler form of apparatus is in regular use in one or two laboratories for filtering solutions. A multitude of cases occur to the pharmaceutist in which it is desirable that his filter should never run very low, as in the separation of essential oils from distilled waters, and in such as these its employment would be of great advantage.

The arrangement was designed by Mr. Wm. Rennoldson, of Newcastle, and the model shown was lent by Mr. A. Freire-Marreco, Reader in Chemistry in Durham University, by whom it has since been presented to the Museum of the Pharmaceutical Society at Bloomsbury Square.

ON SPECIFIC GRAVITY OF TINCTURES.

BY W. LAIRD, PH. C., DUNDEE.

In the British, in common with other pharmacopœias, after the formula for the preparation of a good many of the acids, liquors, and solutions, we have a note of the "characters and tests" of the various products. On looking over the P. B. it occurred to me that it was a pity that the compilers had not carried out the same rule in the section for tinctures. In two cases only is there any mention made of the characters the product is expected to possess,—Tinct. Opii and Tinct. Ferri Perchloridi. It is surely of as much importance for us to know the sp. g. of any of the other tinctures as of Tinct. Ferri. Why tell us that sp. g. of Syrupus is 1·330 and say nothing of that of Tinct. Opii; or why tell us that Syr. Rhamni is 1·32 and say nothing of Syr. Rhei, Scillæ, or Zingib.? If useful in the one case, it would be in the other. Being strongly impressed with this idea, I would suggest that the members of this Conference might aid in completing this portion of the P. B. by recording the sp. g., and also any peculiarity of tinctures as prepared by them, and forwarding their notes to the meeting. Some may be inclined to think this useless trouble, but I have a case in point, showing a knowledge of the sp. g. of a tincture to have been useful in at least one instance in the detection of unfair trading.

Some time ago I was told of a person who was selling tincture of ginger

for 2*s*. per 16 fluid ounces. I at once said it could not be good, but was assured that it was so. I procured some of the tincture in question, and found its sp. g. to be ·898 instead of ·840 as I had previously found it to be when made according to the P. B. On separating the spirit I found it to be ·895, or 26 per cent. instead of 50, showing that this tincture was made with a spirit 16 overproof instead of that required by the P. B. The money value of the spirit would be about 15*s*. 7*d*. instead of 22*s*.

The present duty on 60 O. P. is 16*s*. 0*d*.
„ „ 16 „ 11*s*. 7¼*d*.

Loss to Revenue . . . . 4*s*. 4¾*d*. on

every gallon of this tincture sold. This portion of the question we may, I presume, leave to the Excise; and we will rest content if our bringing this under notice result in ultimately establishing an approximate standard of specific gravity for all tinctures. I subjoin that of those I have myself kept note of.

Tinctura Benzoin Co. . . .	·898	Tinctura Lupuli.	·930
Tinct. Camph. Co. . . .	·927	Tinct. Myrrhæ	·845
Tinct. Cardam. Co.	·955	Tinct. Opii	·940 (average of three makings.)
Tinct. Catechu	·960	Tinct. Zingiber.	·840

While on this subject, may I be allowed to ask what should the sp. g. of Decoct. Sarsæ Co. 1 to 7? I have two samples purporting to be of same strength; one is 1·105, while the other is only 1·04!

NOTE ON A BLACKISH-GREEN INSECT-WAX.

BY R. REYNOLDS, F.C.S.

Attention has been called to a variety of black wax by the paper lately published by Dr. Smith.* Unfortunately, no history of Dr. Smith's specimen can be given, and it may fairly be doubted whether it is an animal or a vegetable product. In the instance which I now bring before the Conference there is sufficiently clear evidence of the source of the wax. I received the specimen directly from the discoverer, who tells me that he brought it from one of the group of islands in the Pacific Ocean, known as the Line Islands. The natives of these islands are a highly savage race, and but little intercourse with Europeans takes place. There are two specimens, the first being a mass weighing several ounces, just as taken from the stump of a tree. The insect producing the wax is said by my informant to be about the size of a small house-fly. There is little trace of structure to be detected, heat seeming to have destroyed this. The colour may be described as being a blackish-green; the odour is well-marked, resembling anise in consistence: it is softer than English bees'-wax, and more tenacious. The second specimen was clarified before it was brought to this country, having been melted with water and strained; the removal of some sand has been the chief result. As the first specimen has only been in my hands for a week, I am unable to speak definitely as to its chemistry. However, a few experiments upon the proportion taken up by various solvents, as alcohol, ether, etc., suffice to show that it is quite distinct from the product of *Apis mellifica*. I hope to give the results of a chemical investigation to a future meeting of the Conference.

* Pharm. Journ. July, 1868.

ON THE SCAMMONY AND JALAP OF COMMERCE.

BY H. SUGDEN EVANS, F.C.S.

I have received very few samples of these drugs or their preparations through the Secretaries of the Conference, and am indebted to casual circumstances for the specimens now reported upon.

Few drugs, perhaps, reach the market more highly seasoned by adulteration than scammony, or of such varying quality from causes dependent upon soil and situation of growth, or the mode of collection and preparation of the drug.

The Greek peasants are most careful in the collection and preparation, and hence they furnish the market with the finest qualities. The Turks, on the contrary—indolent by nature and careless by habit, but industrious in fraud—furnish the inferior qualities, and the very carelessly-gathered scammony is often sophisticated and deteriorated by an addition of from 20 to 150 per cent. of earthy matter before it reaches the dealers at the port of shipment. Here again, to suit the requirements of the British market, it is further "blended" with definite proportions of rubbish, called "skillip." In olden times scammony, as collected in mussel-shells, without any further preparation, was exported, and the drug attained a high repute as a sure and effective medicine; but we cannot feel surprise, on reviewing the following results of analysis, that it should now be in comparative disfavour, and regarded as a medicine of very uncertain action.

Analysis of Seven Specimens of so-called Virgin Scammony.

		Percentage of resin soluble in ether.
No. 1.	Very choice flat cake . . .	96·52
2.	Good ordinary	84·23
3.	Ordinary	71·79
4.	Ditto	63·52
5.	Ditto	60·68
6.	Ditto	59·54
7.	Specimen, per Hon. Sec., labelled "G., cost 42*s.*, had been kept in a damp cellar for fourteen years" .	95·10

Analysis of Eight Samples of Aleppo and Low Scammony.

No. 1.	. . . . .	47·62
2.	. . . . .	39·24
3.	. . . . .	26·58
4.	. . . . .	15·24
5.	. . . . .	18·30
6.	In cakes of farinaceous matter washed over with scammony	5·00
7.	. . . . .	13·41
8.	. . . . .	11·23

No. 6 was a sample of evidently fictitious scammony, and a dog ate with evident gusto, and without any after ill consequences, the balance of the cake after analysis.

Analysis of Eight Samples of Powdered Scammony.

		Percentage of resin soluble in ether.
No. 1.	Called "Aleppo" . . .	54·21
2.	„ "Virgin"	72·36
3.	„ "Aleppo" . . .	37·29

		Percentage of resin soluble in ether.
No. 4.	Called "Virgin," per Hon. Sec.	64·66
5.	,, ,,	59·62
6.	,, "Aleppo"	27·89
7.	,, ,,	30·39
8.	,, ,,	18·22

To whom pertains the responsibility of this very unsatisfactory state of things? The Turks and Greeks tell us they cannot get a remunerative price, and the English merchant says he cannot induce the Turks to be honest; and possibly both have a considerable amount of truth on their side. There can be little doubt upon this fact, that sophisticated and spurious kinds meet a readier market and realize an infinitely better return upon their intrinsic value, than do the richer and more valuable sorts. If the public will not pay an adequate price for a genuine article, but will be content with something bearing truly the name and external appearance of scammony at their own price, they must not be surprised when informed that they have bought scammony, but plus something else—they have demanded a cheap article, and must not grumble at paying the artist for so generously pandering to their taste. This is simply in obedience to the law of supply and demand. But should the very scrupulous Jews and Turks—finding their compounds are received so complacently, and the prices they realize indicate that we are no judges of intrinsic worth—increase the percentage of "skillip" in conformity to their own conscience, can we wonder or very much blame them? The responsibility rests with ourselves, and the probable result of the introduction of a definite preparation in the Pharmacopœia of the resin scammony will do a very great deal to put a stop to the trade in adulterated scammony.

It has been asserted, however, that this new preparation, Scammoniæ resina of the British Pharmacopœia, has become the subject of adulteration, but the utmost we can gather from the following results is, that at least it is sometimes very carelessly prepared.

Analysis of Four Samples of Scammoniæ resina, B.P.

Scammoniæ resina.	Sol. in Ether.	Sol. in Alcohol.	Sol. in Water.
A.	98·26	—	1·74
B.	92·55	5·54	1·90
C.	86·21	8·42	4·37
D.	95·81	1·68	2·51

B. and C. appear to have been carelessly prepared, the saccharine and extractive matter not having been thoroughly washed out, nor the resin perfectly dried afterwards. To a smaller extent, the same remark applies to D., a sample received through the Hon. Sec.

Of jalap, its powder or resin, only one specimen of each was received through the Hon. Sec.

Commercially speaking, there are at the present time only two varieties of Jalap—the Vera Cruz and the Tampico. The Pharmacopœia orders the tuberous root of the *Exagonium purga*, and therefore it only should be employed in pharmacy. Fair average samples of this jalap yield in the laboratory, according to my experience, an average of 38 per cent. of extract, prepared according to the directions of the British Pharmacopœia, 42 per cent. being the maximum, and 35·1 per cent. the minimum result. Tampico jalap, on the other hand, yields very uncertain results, and the extract obtained is very different in its constitution to that produced from the true Vera Cruz. A careful analysis of the two varieties gave the following results:—

	Vera Cruz.	Tampico.
Resin insoluble in ether . .	15·2 per cent.	6·0 per cent.
„ soluble	0·0 „	7·1 „
Grape Sugar	9·0 „	26·9 „
Total soluble in alcohol .	24·2 „	40·0 „

from which we see, although the aggregate yield is much greater in the Tampico jalap, the resinous contents are very much inferior; and in these figures, I take it, is found a decided answer to the query, which root possesses the greatest medicinal value? and we can have no doubt that the Tampico jalap should not be substituted for the Vera Cruz.

The large imports which take place of Tampico jalap, and the readiness with which it is taken off the market, prove that it is extensively used, and its very much lower commercial value, if not an inducement to substitute it for Vera Cruz in the preparation of extract or resin, is a very strong temptation to its use for grinding.

Analysis of Samples of Jalap Powder.

Source.	Soluble in Ether.	Soluble in Alcohol.		Aqueous Extractive.	Microscopical Characters.
		Resin.	Sacchar.		
Authenticated Vera Cruz .	4·00	14·30	14·70	22·16	All the characteristics of Vera Cruz.
Authenticated Tampico .	13·66	1·50	11·16	18·33	An abundance of empty and collapsed cellulose; bundles of scalariform tissue; abundance of resinous cells, which disappear on addition of ether; small truncated starch grains; many empty starch sacs.
G. per Hon. Sec. Brit. Ph. Conference .	9·50	2·83	8·65	20·16	A good deal of woody bundles and scalariform tissue, with foreign starch grains, very much resembling those of wheat.
D. retail unknown . .	8·26	3·22	10·1	17·26	
E. „ from North . .	5·36	12·60	10·25	21·8	
F. & C.-V. C. .	1·20	15·0	9·66	15·26	
H. assumed Tampico .	7·1	6·0	17·20	8·60	
I. E. S. . . .	trace	15·2	9·00	19·50	

What the relative medicinal value of the resin soluble in ether, and that insoluble in this menstruum may be, is a fitting subject for the therapeutist to determine. It would appear, however, that either through the agency of variety of species, or of soil, or of age, or period of collection, the resin of the Vera Cruz jalap undergoes a splitting-up into ether-resin, and saccharine matter.

Three samples of *Jalapæ resina*, B.P., were examined with the following results :—

	Sol. in ether.	Sol. in alcohol.	Sol. in water.
A. hard, but yielded on exposure to air	8·26	86·66	5·08
B. quite brittle, and retaining its consistency	3·08	93·82	3·10
D. hard, but not brittle, speedily attracted moisture, forming a remollient mass	37·51	44·37	18·12

Sample D. had evidently been prepared from Tampico jalap.

ON THE ESTIMATION OF TANNIC ACID.

BY JOHN WATTS, B.SC.

In March, 1867, I published a paper in the 'Pharmaceutical Journal' upon the "Various Processes which have been proposed for the estimation of Tannin," in which I endeavoured to embody my own experience, and, at the same time, to test the relative efficiency of the several methods therein described. I wish now to supplement that paper by a few remarks, and to endeavour to show, if possible, the condition in which the subject remains down to the present date.

Fleck's Process.—In the 'Bayerisches Kunst und Gewerbeblatt,' 1860, pp. 209-225, Dr. H. Fleck introduced a new method for the analysis of tanning materials, based upon the fact that both tannic and gallic acids are completely precipitated from solutions containing them by neutral cupric acetate, and, moreover, upon the property possessed by cupric gallate, to become redissolved by a solution of ammonic carbonate. It is obvious, then, that the calculation of the percentage of tannic acid in any substance can be effected either by bringing the washed cupric tannate to the balance, or by the estimation of an excess of cupric salt. This method has, I understand, obtained considerable reputation in Continental laboratories, though, as far as I am aware, it has never appeared in any of our English chemical periodicals. The details of the process are as follows :—

Standard Solutions.—A solution of neutral cupric acetate is prepared either directly from the commercial article, or by dissolving the diacetate (verdigris) in strong acetic acid, allowing the solution to crystallize, and redissolving the crystals so obtained in thirty times their weight of distilled water. The solution is then ready for titration. 2 grammes of pure copper obtained by galvanic deposit are dissolved in nitric acid without heat, and diluted with pure water, so as to yield a volume bulk of 1 litre. Every c. c. of this solution contains 2 milligrammes of copper. 10 c. c. of this liquid are then run into a beaker, slight excess of ammonic carbonate added, and a solution of cyanide of potassium dropped in from a burette until the blue colour disappears. The number of c. c. of cyanide required correspond to ·002 grm. of pure copper.

With care and practice this may be done with great exactitude, but to obtain consonant results it is necessary that the solutions of copper and ammonic carbonate should always be employed in the same relative proportion; that is, if in one analysis 10 c. c. of copper be used in conjunction with 20 c. c. of ammonia, in a second experiment the same quantity of copper must *not* be employed with 30 or 40 c. c. of ammonia, otherwise the proportion of cyanide required will not be constant.

The solution of acetate is titrated in a precisely similar manner against the cyanide solution; and as the power of this latter has been already ascertained, a simple rule-of-three sum will show at once the proportion of copper in any given number of c. c. of the solution of cupric acetate. Analysis: About 1 gramme of the astringent substance which it is desired to submit to experiment is boiled with 50 grammes of pure water, filtered, and filter washed with boiling water, so much water being added that filtrate and wash water together measure 100 c. c.; 25 c. c. therefrom are taken for the experiment, mixed with 10 c. c. of the previously properly titrated solution of cupric acetate and 10 c. c. (excess) of solution of ammonic carbonate, and the whole raised to the boiling-point. The precipitate which ensues is collected on a filter, and washed with boiling distilled water. The filtrate serves to estimate the proportion of cupric oxide which has not entered into combination with the tannic acid. By determining, therefore, the quantity of copper in the filtrate by means of KCy, and deducting this from the quantity of copper known to be contained in 10 c. c. of the solution of cupric acetate, the quantity of copper which has combined with the tannic acid is ascertained. It only remains to fix the composition of the cupric tannate, in order to be able at once to calculate the percentage of tannic acid.

I have given the volumetric determination thus in detail because it forms one of the principal features of Fleck's process; though, as I shall presently show, the estimation by volume cannot in any case be relied upon, save only when operating with purified tannic acid.

From a series of experiments Fleck has determined that ·00568 grm. copper correspond to 1 per cent. of pure tannin, and ·00875 grm. copper to 1 per cent. of pure gallic acid. This latter relation, however correct, is valueless, since the whole of the colouring matter in the infusion combines with, and is precipitated by the copper salt, the which passing into solution on the addition of the ammonic carbonate would be reckoned as gallic acid were we to attempt to estimate the percentage of that body. With respect to the correspondence between copper and tannic acid, the numbers I have obtained do not correspond with those of Fleck. I find that 1 gramme of commercial tannin dried at 100° C. combines with ·3911 gramme of metallic copper=·489 gramme of oxide, and the following are the analyses upon which this assertion is based:—

In every case 10 c. c. of acetate solution were used, and by previous experiment, it was found that—

10 c. c. acetate solution=15·34 c. c. cyanide.
10 c. c. nitrate ,, = 2·5 c. c. ,,
therefore 10 c. c. acetate ,, = ·1227 grm. copper.

A. ·2195 grm. tannin took 4·94 c. c. cyanide=6·774 c. c. acetate consumed.
C. ·1445 ,, ,, 7·9 ,, ,, =4·85 ,, ,, ,,
B. ·1745 ,, ,, 6·4 ,, ,, =5·83 ,, ,, ,,
D. ·191 ,, ,, 6.65 ,, ,, =5·67 ,, ,, ,,

A. 1 gramme tannin=30·86 c. c. cupric acetate
B. 1 ,, ,, =33·56 ,, ,, ,,
C. 1 ,, ,, =33·41 ,, ,, ,,
D. 1 ,, ,, =29·70 ,, ,, ,,

Mean=31·88 ,, ,, ,,

Therefore 1 grm. tannin=31·88 c. c. of acetate=·3911 grm. copper=·489 grm. CuO.

The two following analyses show the same result by ignition of the tannate.

·1045 grm. cupric tannate gave on ignition ·03425 grm. CuO;
·07025 tannin : ·03425 CuO :: 1 : ·487.

·12025 grm. cupric tannate gave on ignition ·0625 grm. CuO;
·12025 tannin : ·0625 CuO :: 1 : ·519.

Percentages calculated with this number correspond exceedingly well with the amounts obtained by the gelatine process.

The next step to be ascertained, and which is of primary importance to the success of the operation, is whether the cupric tannate precipitated from solutions of the various tanning materials possesses in all cases the same percentage composition as that obtained from gall nuts. I have made a number of experiments to elucidate this point, and find that, although the analyses of the tannates show a slight variation *inter se*, such variation is fairly within the limits of error, and that all the tannins which I have examined, giving a blue precipitate with a persalt of iron, may fairly be reckoned as gallotannic acid. The so-called Mimosa bark (supposed by some to be the produce of a cinchonaceous tree) alone appears to vary in this respect, its tannin combining with 19 per cent. less copper than that of the other gallotannates. Indeed, it is somewhat doubtful under what head it should be ranked, as it gives neither a blue nor a green colour with a ferric salt, but a dark grey precipitate insoluble in solution of ammonic carbonate. 1 gramme of mimosa tannin consumes ·2959 grm. CuO; it is necessary, therefore, to use this number instead of ·489 grm. when calculating percentages of this substance.

I append a few analyses, which are sufficient to show how the numbers were obtained. The various tannates were prepared in a pure state by precipitating an infusion of the substance by cupric acetate, adding excess of ammonic carbonate, and, after boiling, washing the precipitate on a filter with hot distilled water, and drying at 100° C.

Valonia. ·1147 grm. copper salt gave on ignition ·0372 grm. CuO;
·0775 tannin : ·0372 CuO :: 1 : ·480.

Pomegranate Root-bark. ·1223 grm. copper salt gave ·0391 grm. CuO;
·0832 tannin : ·0391 CuO :: 1 : ·471

Sumach. ·14936 grm. copper salt gave ·04986 grm. CuO;
·0995 : ·04986 :: 1 : ·501.

Divi-divi. ·1249 grm. copper salt gave ·0408 grm. CuO;
·0841 : ·0408 :: 1 : ·485.

Mimosa. ·28975 grm. copper salt gave .06525 grm. CuO;
·2245 : ·06525 :: 1 : ·2906.

Mimosa. ·3175 grm. copper salt gave ·0735 grm. CuO;
·244 : ·0735 :: 1 : ·3012.

With the exception, then, of the mimosa tannin, which seems to be anomalous, we see that 1 gramme of tannin derived from any substance containing gallotannic acid combines with a quantity of cupric oxide weighing ·489 gramme.

This brings me to a very curious and interesting point in connection with the process, viz. that a tannin giving a greenish precipitate with a ferric salt cannot in any case be analysed by the above method, simply because the precipitated tannate is more or less soluble in solution of ammonic carbonate. The fact was first brought under notice by the abnormally small percentages obtained from certain materials, and upon trial it was found that the cupric tannates precipitated from tormentil, rhatany, larch bark, willow bark, catechu, kino, eucalyptus extract, hemlock (*abies*) extract, etc., were completely soluble in caustic ammonia, and very considerably so in solution of the carbonate. All these substances contain mimotannic acid; on the contrary, the tannate from a body containing gallotannic acid is totally insoluble in either ammonia or its carbonate. I shall allude again to this peculiarity when speaking of the distinctions existing between these two varieties of tannin.

In analysing astringent substances by this process it would appear at first sight, since both the colouring matter and gallates are dissolved by the ammonia salt, that we might adopt either the gravimetric or volumetric method of procedure, either weighing the washed and dried precipitate, or estimating the excess of a previously-known quantity of copper; but this latter method, however, unfortunately, does not work in practice, and I am surprised that Dr. Fleck should lay such stress upon it, since the results obtained by it are so obviously erroneous. The action of the alkali upon gallic acid, when oxygen is present, produces, as is well known, dark brown-coloured products of the nature of ulmic acid; and though in this instance the change proceeds but slowly, it is more than sufficient to entirely mask the termination of the reaction, since the liquor, instead of being colourless, is more or less yellow, which causes the original solution to possess a green colour instead of blue. Again, the cyanide does not appear to decompose the cupric gallate in the same proportion as the acetate, since the volume of cyanide which is sufficient to discharge the blue colour is invariably found to be less than calculation would indicate, and thus the percentage is unduly raised. Moreover, the cyanide has the property of combining chemically with gallic acid, as I have prepared a beautiful white crystalline salt by the agency of these two bodies in presence of ammonia, the which, though I have not had time to analyse, I am assured contains cyanogen. This fact would also doubtless tend to affect the real volume of cyanide used, and vitiate the results.

If we now proceed to analysis by weight, we shall find the results highly satisfactory. There will, of course, be always the one drawback, that we cannot estimate mimotannic acid; and, further, that where many commercial analyses have to be conducted, estimation by weight is not sufficiently rapid. Nevertheless, I was greatly pleased to find that the percentages obtained by this method were, in nearly every instance, corroborated by the old gelatine process.

Valonia	·279	grm.	gave	·1208	tannate	= ·08112	tannin	= 29·7	per cent.
Mimosa	·2521	„	„	·1255	„	= ·0968	„	= 38·3	„
Sumach (Palermo) .	·2785	„	„	·0928	„	= ·0623	„	= 22·3	„
„ (another variety)	·4502	„	„	·0639	„	= ·0429	„	= 9·5	„
Kermes Oak . . .	·5608	„	„	·085	„	= ·057	„	= 10·1	„
French Coppice Bark	·4991	„	„	·0331	„	= ·0222	„	= 4·4	„
Aleppo Galls . . .	·16945	„	„	·152	„	= ·102	„	= 60·1	„
Divi-divi	·246	„	„	·122	„	= ·0819	„	= 30·7	„

In the accompanying table, the numbers are compared with those obtained by gelatine and by volumetric copper :—

Gallotannic Acid.	Percentage by Weight.	By Gelatine.	By Volume, *showing error.*
Valonia	29·7	29	43·13
Sumach (Palermo) .	22·3 20·0	20·2	34·0 34·0
Sumach (unground) .	9·5 9·1	9·5	17·2 17·0
Kermes Oak	10·1	10·4	impossible to see the reaction.
Divi-divi	30·7	29·8	—
French Coppice Bark .	4·4	4·5	10·8
Pomegranate Root Bark	...	9·0	—
Aleppo Galls	58·2 60·1	61·0	68·0
Myrobalans	...	38·0	—
Mimosa	38·3 38·4	37·0	51·1

Mimotannic Acid.	*showing error.*		
Tormentil	5·7 . .	19·8 . .	—
Larch Bark	{3·2 / 3·9} . .	4·7 . .	—
Rhatany	0·5 . .	8·4 . .	—
Willow Bark	3·0 . .	6·1 . .	—
Catechu (Gambir) . .	7·0 . .	31·1 . .	—
Eucalyptus Gum . .	... . .	40·7 . .	—
Hemlock Extract . .	... . .	29·0 . .	—
Kino	... . .	40·0 . .	—

Such, then, is the process introduced by Dr. Fleck; as I have shown, it is not capable of very general application, but it will estimate gallotannic acid with considerable accuracy, if the method of direct weighing be adopted. When I first essayed to analyse by it, I thought it would prove eminently successful, but experience has shown, that though it possesses certain advantages, inasmuch as it combines accuracy, without that tedious watching, which is so essential to the success of the gelatine process, yet it can never supersede the latter method as long as mimotannic acid continues to be used in tanning. I have myself devised one or two processes for tannin estimation, but at present with only negative results. Among the most promising of them, was one in which the tannin was precipitated by a volumetric solution of cinchonine, and the end of the operation ascertained by means of the iodohydrargyrate of potassium, which would, of course, give a powerful reaction the instant that the slightest excess of cinchonine was introduced into the solution. This fails from the fact that the tannate of cinchonine is not absolutely insoluble, so that as soon as a few cubic centimetres of cinchonine solution have been added, a small quantity of cinchonine passes into solution, and the iodohydrargyrate commences to react. Another was based upon the fact, that a solution of tannin will reduce ferric salts to ferrous salts, the quantity of iron reduced was then estimated with potassic dichromate; but since the reaction does not always proceed uniformly, and since gallic acid possesses the same reducing power, this property of tannic acid unfortunately cannot be utilized. M. Wagner, a few years since, noticed in the 'Annales de Chimie,' a method which he thought would prove of great assistance in the gelatine process, viz. by adding to one litre of the ordinary gelatine solution, ·1 gramme of hydrochlorate of rosaniline. This body has a great affinity for tannin, and is, equally with gelatine, thrown out of solution by it. As soon as an excess of gelatine was run in, the powerful colour of the rosaniline salt was intended to evidence such excess by its presence in the filtrate; but, upon trial, I found that the affinity of magenta for the organic tannate of gelatine, is greater than for tannic acid itself, and that the precipitate will continue to extract the colour from the solution, even after gelatine has been for a long time in excess.

The Gelatine Process.—The following hints derived from considerable practice, may perhaps prove of service to some one who has occasion to make use of this method of analysis.

1. It is not absolutely necessary in every instance to employ a solution of alum in conjunction with the gelatine, as many substances will give a perfectly clear filtrate, even to the close of the analysis, and the object in using alum is only to ensure a clear filtrate. It is impossible to say what material will give a clear filtrate, or what will not; it is apparently due to some cause entirely beyond control, as the same substances will, with one solution of gelatine, filter perfectly bright, while with another, in every respect similar, it will run through cloudy; temperature also appears to have some effect. When it is found requisite to use alum, it must be with a very sparing hand,

5 to 10 drops of a solution of moderate strength will be found quite sufficient; on the contrary, if a large quantity be used, it will entirely vitiate the analysis; whether under these conditions it has the power of precipitating gelatine or not, I am scarcely prepared to say,—metallic salts generally do not precipitate gelatine, but, according to M. Naquet, alum will do so, if an alkali be likewise present, certainly in this case it causes more gelatine to be required than otherwise would be, and thus raises the percentage. I bought my own experience upon this point, having been once led into considerable error by the injudicious use of this agent.

2. There is no occasion to remove the exhausted material from the liquor, but the analysis may at once be proceeded with in the same vessel, provided the solution has become *perfectly* cold. It is, however, convenient where several analyses are intended to be made of the same substance, to exhaust a larger quantity, to decant the liquor, and, after washing the dregs on a filter, to make the solution up to, say, 200 c. c., and then to take 50 c. c. for analysis with a pipette.

3. It is useless to attempt to await the subsidence of the precipitate; even should it subside readily, the supernatant fluid would be scarcely clear enough to test. A large number of filters, about 5 centimetres in diameter, must be provided; and, when it is required to test, a small quantity is to be run through a filter, and 2 drops received from it on to a black glass plate; a drop of filtered gelatine solution is then placed in the centre of the other drop, in order to see if tannin still remains in the solution; if there is any reaction, the filtrate, filter and all, are to be returned to the beaker, and the operation repeated over again, as often as necessary.

It is essential to work in strong daylight, and neither at dusk nor with artificial light; sometimes a few minutes will elapse before the above-mentioned reaction, between the drops, will manifest itself; at all times it requires considerable patience.

Although I intended this paper to be a purely practical one, it will scarcely be out of place if I allude briefly to some theoretical points which experience has brought under notice, respecting the division of the varieties of tannin into two great classes,—gallo- and mimotannic acids. I have already mentioned that the cupric tannate precipitated from mimotannic acid, is capable of being readily distinguished from the same tannate precipitated from gallotannic acid, by the fact that the former is soluble, while the latter is insoluble in ammonia; and this holds good with every substance that I have experimented upon.

Again, another practical fact, which tends to the distinctive separation of these tannins, is that the leather produced by gallotannic acid is far superior in quality to that produced by mimotannic acid; and it is those substances alone which contain gallotannic acid that will produce upon leather that characteristic bloom, which is considered so important a guarantee both of the success of the operation and of the goodness of the product. Oak bark, sumach, valonia, divi-divi, myrobalans, etc., are all capable of producing this deposit, but with catechu, larch bark, etc, it is entirely wanting. Of course I am aware that it was well known that catechu, willow, hemlock (*abies canadensis*), etc., produced a leather inferior to oak bark, but I do not think it has been before attributed to the fact that these contained only mimotannic acid.

That differences of opinion have existed respecting the relationship of these tannins, is shown, inasmuch as Berzelius, Geiger, Waltl, and Cavalius, were all of opinion "that tannin, from whatever source it may be obtained, is identical, and that the difference of the reactions with iron salt must be attributed to impurities which are accidentally present." In opposition to

this, Dr. Stenhouse, extending the experiments of Strecker to the various tanning materials, showed that while most of the gallotannates could be split up into gallic acid and glucose, only one mimotannate, viz. the tannin of the willow, would undergo the transformation, and he considered this a fair proof of the distinction between the two tannins. More recently the labours of M. Kawalier and M. Knop have tended to show that tannic acid is not a glucoside, since M. Knop has been able to convert the whole of tannin into gallic acid, except a loss of 4 to 6 per cent., which consisted principally of ellagic acid; and he considers that this shows distinctly that tannin cannot be arranged in that class of bodies to which we refer salicine, amygdaline, œsculine, etc.; and Kawalier has proved that though tannin may be obtained free from the impurity which furnishes ellagic acid, it cannot be entirely purified from the second body, which furnishes sugar when decomposed, although the amount of this impurity may be so much reduced, that the quantity of sugar bears no relation whatever to the weight of tannin employed.

However, whether tannin be a glucoside or not, the experiments of Dr. Stenhouse remain the same; whatever may be the body, which, undergoing decomposition, produces glucose, that body is not present with mimotannic acid; and though not necessarily constant with gallotannic acid, which shows a distinction of species, the rule is sufficient to strengthen the argument for separating the varieties of tannin into two genera.

For my own part, I am anxiously looking forward to the time when tannic acid shall be artificially produced by synthetical means; synthesis is now making such rapid progress, that the above is not at all an extravagant idea; gallic acid has been already so prepared. We shall then, possessing a tannin free from organic impurities, be enabled both to estimate its combining number for analytical purposes, and also to set at rest all doubts respecting its constitution.

OBSERVATIONS ON EXTRACTUM CARNIS (LIEBIG).

BY THOS. T. P. BRUCE WARREN, F.E.S.

If an aqueous solution of extractum carnis be digested with a large quantity of rectified ether, there is found on the surface of the solution, after a short time, a substance which does not dissolve in the supernatant ether, and if mixed mechanically, by agitation, with the solution, again separates, occupying the same position as before.

I was led to this observation on examining extractum carnis for fatty and gelatinous matters about four years ago, during which time the contents of the bottle have remained undisturbed. I convinced myself at the time of its not being either of a gelatinous or fatty character; and not being at the time acquainted with a substance of such an apparently intermediate relation, I thought it would be interesting to determine at a future time the properties which this substance possesses as compared with the already examined principles existing in extractum carnis, and to compare it with the proximate principles existing in animal tissues, and which are possible to exist in extractum carnis.

The ether was first carefully decanted, and the solution separated by filtration, the substance remaining on the filter was thoroughly washed with boiling water.

On the surface of the solution it appeared as a jelly-like stratum, with

a large quantity of air bubbles invariably adhering to it, and which were removed only by drying.

It possesses in an eminent degree the smell peculiar to the extract, and is decomposed by heat without melting. It is not dissolved by boiling water.

In dilute acetic acid, the caustic alkalies, and alcohol it is partially soluble. Its alkaline combinations yielded no crystals.

These results, and notably that of its swelling in water without dissolving, and its insolubility in ether, show that it consists principally of cerebric acid, derived probably from the nerves which ramify the parts from which the extract is made.

A suggestion arises, that cerebric acid, as transpersed through the nerves of the muscles, may have a distinct modification to that found in the brain, for its insolubility in water should prevent its appearing in the extract even in the smallest quantity.

COMBINATIONS OF QUININE AND IODINE.

BY THOS. T. P. BRUCE WARREN, F.E.S.

Some years ago I required a small quantity of iodide of quinine for a medical prescription, which I prepared by adding iodide of potassium to a solution of disulphate of quinine in water very slightly acidified with sulphuric acid.

To my surprise, I found that instead of obtaining the pasty precipitate as described, it yielded a lemon yellow deposit. No change took place unless it was well stirred, or the sides of the vessel rubbed with a glass rod. The deposit, viewed under a microscope, was found to consist of very small prismatic crystals, perfectly insoluble in water, but readily soluble in cold alcohol.

The mother liquor filtered from the deposit gave, on evaporation, a large quantity of orange-coloured feathery crystals, which were easily dissolved in cold water.

Solutions of both these salts are rapidly decomposed on exposure to air. From this fact I have not yet been able to ascertain satisfactorily the proportions of iodine and quinine contained in them.

I was tempted by mere curiosity to try the effect resulting from a synthetic process, by adding recently-precipitated quinine to an aqueous solution of hydriodic acid. The quinine dissolved rapidly, yielding a fine yellow-coloured solution. On evaporation and cooling, it gave fine well-defined crystals of a pale yellow colour, and which are but slightly altered on exposure to air.

Some crystals which I obtained about three years ago by this method have changed to a slightly reddish tint of yellow, whereas crystals obtained by the other method can scarcely be dissolved without change.

I submit these remarks as I consider no information can be regarded as trivial which might affect the production of a remedial or pharmaceutical preparation.

RESULTS OF ELECTRICAL EXAMINATION OF COMMERCIAL SAMPLES OF OLIVE OIL.

BY THOS. T. P. BRUCE WARREN, F.E.S.

The object of this paper is to lay before the Conference the practical application of a test which I had the honour of introducing at its meeting in Dundee.

Want of time has prevented me from obtaining more than seven samples for examination.

These samples were purchased as "best olive oil," from different localities; the price paid varied from 1*d.* to 2*d.* per fluid ounce.

The general result proves that olive oil is subject to extensive adulteration, and that the sale of adulterated oils, though principally confined to the poorer districts of the Metropolis, is not altogether absent from neighbourhoods of higher respectability.

The instrument and conditions under which these tests have been taken, are precisely the same as those mentioned in my former paper. I shall, therefore, proceed to describe the samples at once. Sample No. 1 was obtained from a dispensing establishment in the City; No. 2 was obtained from a "small retail" in Fleet Street; Nos. 3 and 5 were procured from the New Cut, Lambeth; No. 4 was supplied by a chemist, who confessed to having other qualities of olive oil; sample No. 7 was purchased in Waterloo Road; No. 6 was taken from a flask of salad oil, supplied by a respectable oilman.

In colour these samples varied but slightly from each other. They possessed marked differences in smell; No. 5 having a decided odour of cotton-seed oil. When strongly agitated with an aqueous tincture of litmus and allowed to stand for a few minutes, No. 1 indicated a strongly acid reaction, which was scarcely perceptible with No. 4. The other samples, treated in a similar way, gave no differences of result, the colour of the tincture being nearly unaltered.

No. of Sample.	Deflections.		Resistances in Omads.	
	1st Min.	2nd Min.	1st Min.	2nd Min.
1	18	...	5,720 $\times 10_6$	
2	90	...	1,144 „	
3	200	130	515 „	792 $\times 10_6$
4	19	...	5,420 „	
5	360	400	286 „	285 „
6	57	...	1,806 „	
7	215	270	479 „	381 „

From the deportment of samples 5 and 7 under the action of prolonged contact, I have no hesitation in stating that they contain either oil of poppies or cotton seed oil, and from their low resistances it is very certain that the adulterating ingredient has been very liberally added. Sample No. 3 differs in its behaviour from 5 and 7, and I am, therefore, inclined to believe that a different material has been employed in its adulteration. Samples 1 and 4 are decidedly genuine. No. 7 is probably a mixture of olive oil and highly refined cotton-seed oil.

REPORT ON THE VARIATIONS IN THE QUALITY OF COMMERCIAL CHLORINATED LIME.

BY WENTWORTH LASCELLES SCOTT, F.C.S.

(*Preliminary Report.*)

Although I must apologize at the outset for the crudeness and brevity of the succeeding observations,—a result in some measure attributable to the very great difficulty of obtaining by my own unaided endeavours a sufficient

number of reliable "samples" for examination,—I have thought it better to ask your indulgence upon the present occasion, in the hope that members of the Pharmaceutical Conference and others may, during the next twelve months, be charitable enough to assist me freely with specimens, facts, and suggestions relative to "Commercial Chlorinated Lime."

As far as I have proceeded in this inquiry,—and I may as well confess at once that the work accomplished as yet amounts to very little indeed,—the results obtained appear to warrant the following general conclusions, which are given here with the view of eliciting the opinions and experiences of others rather than for any special weight or importance of their own. I am led to believe—

1st. That too little attention is, in many instances, paid to the condition and quality of the limestone from which the first essential material—caustic lime—is obtained, as, in the course of the experiments, I have found almost every conceivable impurity in the commercial "chloride," including many that could not be present unless calcareous stones of an entirely unsuitable nature had been employed. I am aware that in numerous cases this is difficult to avoid, from the manufacturers not calcining their own quicklime; but even here a good rule would be to permit no lime to be slaked for the chlorine chambers unless previously examined, and found fit for use. Were this more generally insisted upon, the "stinking" bleaching powders now complained of would be less frequently met with, and a higher percentage of available chlorine would be readily obtained.

2nd. That it is of the first importance in the manufacture of bleaching-powder that the lime employed should be effectually slaked before it comes in contact with chlorine. This may appear a very uncalled-for suggestion, but some circumstances have come under my notice which are, to my thinking, conclusive of the fact that, from the anxiety felt by some makers to use the hydrate of lime before any carbonic acid has been absorbed, occasionally a small portion of free caustic-lime remains, which, in the presence of a current of *moist chlorine gas*, becomes heated, and initiates the formation of a little *chlorate* of calcium—a most pernicious ingredient.

3rd. That the "chlorinated lime" of commerce is at present an indefinite, unsatisfactory product, which opens up an extensive field for underselling, adulteration, and other dishonest practices. By the continual extension of trade publications of all kinds, we are supposed to be getting better and better acquainted with the current value of all commercial products, especially drugs and chemicals; but I must frankly confess that I am utterly ignorant of the proper price of "chloride of lime" at this moment; or, supposing some to be quoted to me at 14*s*. 9*d*. per cwt., have no idea what I should get for my money. Among the more obvious consequences of this uncertain state of things may be mentioned the inconvenience experienced in the bleaching and dyeing trades, from the difficulty of obtaining a chlorinated liquor of definite strength; the uselessness of special formulæ for the preparation of "Liq. Sodæ Chlor.;" the loss and uncertainty entailed in the manufacture of chloroform; and the doubts engendered in using the chloride as a disinfectant. I once asked a Lancashire calico-printer to tell me confidentially how much it would cost him, for bleaching-powder only, to bleach 1000 yards of "grey cloth" of a particular "reed"? He replied, pointing to a number of pieces, "I could tell you without very much trouble what *those* have actually cost; but a similar quantity next time might cost me either half or double the amount, for anything I know. The lime is never twice alike."

4th. That the present system of quoting the price of chlorinated lime is unsatisfactory and unjust, while it tends to discourage the manufacture of a superior article.

5th. That it would be far better, both for manufacturers and pharmaceutists, to insist upon its being quoted at 1 per cent. of the available chlorine contained therein; and, to coin a convenient, if not a very euphonious term for the purpose, I beg to propose that the price be given at per *chloricent.* Thus, supposing the market value of chlorinated lime at any particular time to be published at "6½*d.* per chloricent," the price of specimens yielding 24, 28, and 30 per cent. of chlorine would be 13*s.*, 15*s.* 2*d.*, and 16*s.* 3*d.* per cwt. respectively.

5th. That one, or at most two, standard methods of testing should be recommended by the Pharmaceutical Conference for general adoption.

I have appended herewith a short table, which, by your kind assistance, will, I hope, be greatly extended hereafter, exhibiting a few of the analytical

Table showing the Variation in Quality of Different Specimens of Chlorinated Lime.

No. of Sample.	Price (when known) per cwt.	Water. Per cent.	Available Chlorine. Per cent.	Total Chlorine. Per cent.	Matter insoluble in water. Per cent.	Matter insoluble in dilute acid. Per cent.	Value at 6*d.*† per Chloricent cwt.	Observations.
1	13/9	4·8	26·7	28·4		2·1	13/4	An excellent specimen.
2	——	*	18·2	33·7		4·7	9/1	A low sample—dear at any price.
3	——	9·8	13·8	27·9		6·3	6/11	A low sample — contained Chloric Acid (1·43 per cent.) and was adulterated.
4	——	3·9	34·6	36·7		2·9	17/4	A standard specimen.
5	15/6	7·1	16·4	27·1		8·4	8/3	Supplied at same price, by the same maker.
6	15/6	6·4	22·3	29·6		6·2	11/2	
7	16/2	*	17·2	21·4		11·3	8/7	Possessed a bad odour; contained trace of Phosphide; would not make Chloroform.
8	14/0	4·3	——	33·2		8·7	——	Contained 6·9 per cent. of *Chlorate.*
9	17/2	14·6	24·6	29·7		3·1	12/4	Traces of Arsenic observed.
10	——	11·2	19·1	27·4		3·8	9/7	
11	14/6	5·6	21·3	30·6		5·8	10/8	Rather unpleasant odour.
12	13/10	15·2	8·7	38·0		9·7	4/4	Contained near 2 per cent. of *Chlorate* and much Carbonate of Calcium.
13	——	6·4	31·2	33·9		3·3	15/7	
14	15/9	7·8	23·4	29·1		4·1	11/9	Contaminated with phosphides.
15	——	*	18·5	26·4		7·1	9/6	Much common salt.
16	——	8·4	15·7	27·9		8·2	7/10	From same makers.
17	13/10	4·9	22·6	29·3		4·8	11/3	

* Not given; samples being unduly moist, and very variable in different parts.

† This arbitrary figure is merely assumed, of course, to facilitate the illustration.

results I have met with thus far. From this it will be observed that the proportion of available chlorine present in the samples varied from under 9 to nearly 35 per cent.; and, even making all allowances for the differences in age which must have existed amongst the several specimens, the variation in quality therefore is certainly excessive.

Whenever possible the sample was taken from four places near the middle of the cask or other containing vessel, in order to obtain a fair average; and experience has convinced me that, when well packed, the "chlorinated lime" suffers no material diminution of strength for many months except for a few inches from the outside. The best method of keeping it, however, is to line the cask, as it were, thinly with finely-powdered caustic-lime.

In determining the amount of moisture, the figures given were arrived at by deducting from the loss in drying at 100° F. in a current of desiccated air, the differences found in estimating the available chlorine on the fresh and dried samples. For the determination of available chlorine I know of no better methods than those depending upon the oxidation of protochloride of iron and arsenious acid, and the presence of chlorates was most conveniently ascertained by slowly decomposing the bleaching powder in an apparatus specially constructed for the purpose by a mixture of carbonic and acetic acids, extracting the chloride of calcium therefrom by means of alcohol, and then washing out the chlorides with water. As will be seen from the table, as much as 7 per cent. of chlorate of calcium was found in one instance, rendering this sample utterly useless for the purposes of dyers and calico-printers. For the prices given in the table I am not responsible, and cannot vouch for their accuracy, except in a few instances, many persons being extremely willing to get your opinion upon a fresh arrival of chlorinated lime, but distrusting your motives immediately if asked what they gave for it.

If the preceding observations, for which no pretensions of intrinsic importance are made, should be the means of attracting the attention of other and more competent inquirers to a subject well worthy of the cognizance of the Pharmaceutical Conference, the objects of the writer will have been fully attained.

NOTE ON SULPHUR PASTILLES.

BY WENTWORTH LASCELLES SCOTT, F.C.S.

The practice of burning sulphur for purposes of disinfection has been known and valued in most countries for many centuries, it being quite common in the time of Cleopatra; but every now and then attempts are made to invest the products of its combustion with superlative curative powers, the excitement consequent thereon generally dying away at the expiration of a longer or shorter time.

As one of these "volcanic cycles," as they might be called, is now apparently just commencing in this country, I have thought that a few words upon one section of this subject might not perhaps be wholly inappropriate.

It is not unreasonable to suppose, from its very remarkable antiseptic powers, that sulphurous acid should be serviceable in the treatment of what might be popularly designated fermentive diseases and affections, as it instantly arrests oxidation in almost every form. Of late, sulphurous acid has been recommended in three different forms—as vapour mixed with that of water for inhalation, in shape of liquid spray, and lastly again in the gaseous form, as produced by burning sulphur in air.

Without expressing any opinion here of its value in a purely medical point of view, my present object is simply to direct attention to the danger

incurred in the use of the ordinary pastilles as commonly sold for disinfection.

I have examined a very large number of these, in this country and in Scotland, and find that, with few exceptions, they are made by simply "casting" sulphur into suitable moulds, the fluid element being mixed with a little finely divided charcoal, or black-lead in some instances. They do not burn evenly, retaining their form, like the aromatic pastilles; but speedily fuse, and become little pools, as it were, of "liquid fire," difficult to extinguish, and extremely liable to inflame surrounding objects. As a rule, these "disinfecting pastilles" are placed in the hands of some servant, who simply applies a match to their point, and leaves them to "burn out;" thus, I hear from a correspondence with several insurance offices, have many "accidental fires" originated during the last few years, to the endangerment of life and property.

I have lately suggested a preferable mode of manufacture, which is now being very largely adopted, several hundredweights per month of *these* pastilles being made at this time.

Pure sulphur is reduced to a state of minute division, and intimately mixed with about 20 per cent. of fresh dry plaster of Paris, some charcoal, and a mere *trace* of nitre; when mixed, a little stiff flour-paste is added, and the whole brought to a dough-like consistency under powerful stones. This dough, being formed in the requisite moulds into "pastilles," the latter are finally dried by steam-heat. Such pastilles burn slowly and evenly, *not* liquefying, and can be readily extinguished if required.

(End of the Second Day's Sitting.)

Third Sitting.

The Executive Committee brought up certain recommendations as to the election of foreign members, in accordance with the resolution passed at the previous sitting. They suggested that for the present the limit to the list of foreign members should be twenty, and they recommended the immediate election of the seven following gentlemen, viz.:—

Professor P. Wendover Bedford, College of Pharmacy, New York City, U. S. A., Corresponding Secretary of the American Pharmaceutical Association.

M. Augustin Ambroise Delondre, Membre de la Société Botanique de France, de la Société Impériale d'Acclimatation, Chevalier de l'Ordre Impériale de la Rose (Brésil) etc., Rue St. Dierre, 3, Sèvres.

Mr. Albert E. Ebert, Chicago, Illinois, U.S.A.

Dr. J. B. Edwards, Ph.D., F.C.S., etc., Ex-Vice-President of the British Pharmaceutical Conference, 73, Alexander Street, Montreal, Dominion of Canada.

Dr. F. A. Flückiger, Bern, Switzerland.

Professor Edward Parrish, College of Pharmacy, Philadelphia, U. S. A.

Professor William Procter, jun., College of Pharmacy, Philadelphia, U. S. A.

A ballot was taken, and the due election of the above as foreign members was announced by the President.

Resumed Discussion on the Pharmacy Act.

The PRESIDENT said that it was impossible that an Act of this nature should be free from imperfections, but there was a difference between a consideration of these as practical questions and the introduction of hypothetical objections which could so easily be raised. He trusted that the discussion would not become needlessly diffuse by the introduction of these last-named questions.

Professor ATTFIELD, before more direct discussion commenced, wished to allude to the probable educational effects of the measure. The Act would bring every future chemist and druggist within the elevating influences of extended knowledge. In enforcing examination it would place every apprentice under circumstances in which the smallest spark of desire for information would have an opportunity of being fanned into flame; and there were few breasts in which such a spark did not exist. His experience of the gentlemen who entered the laboratories of the Pharmaceutical Society showed that all admitted their time and money to be well invested, whether they spent a longer or a shorter time in the institution. It was not unusual for students to tell him that they only wished for so much instruction as would enable them to pass the examinations, but after having gained this, their views altered, and they wished to extend their course of instruction. The new Pharmacy Act would require young men to gain that introduction to knowledge which he (Professor Attfield) was convinced would give them a thirst for much deeper draughts from the same fountain. This was an important reason why the Act should receive their cordial support.

Mr. CARTEIGHE resumed the consideration of the clauses *seriatim*, commencing with clause 5.

In clause 6, Mr. KINNINMONT (Glasgow) spoke strongly of the feeling in Scotland against the fees for the Minor and Major examinations being so high as they are at present.

Clause 9: Mr. GROVES suggested that the aid of the Local Secretaries might be called in to assist the Registrar in placing upon the register all chemists and druggists now in business.

The REGISTRAR said that the suggestion seemed to him to be a very useful one, and he should be disposed to adopt it.

Clause 15: Mr. ATHERTON pointed out that deviations from the formulæ of the British Pharmacopœia were punishable by fine under this clause. Other members queried what then must be done when physicians who were known not to have adopted the British Pharmacopœia sent prescriptions. The reply to this was, that the responsibility of using the British Pharmacopœia rested much more with the physician than was recognized by a recent minute of the General Medical Council, and that the dispenser should clear himself of responsibility by requesting individual physicians either to state generally their wishes, or to indicate them upon each prescription.

Clause 17: The distinction between the sale of poisons by wholesale and by retail was pointed out, the Act being a dead letter as regarded large quantities of a poison, but not so for small ones.

The remaining clauses did not excite much discussion, but clause 4 was again brought forward to enable Mr. H. S. Evans to make an important statement.

Mr. EVANS said that counsel's opinion had been sought by the Council of the Pharmaceutical Society to ascertain the construction to be put upon the term "Assistant" in the Act. Now, he was not able to read *in extenso* the opinion that they had received, because it had not yet been laid before those to whom it was addressed, but he felt justified in stating thus much, viz., counsel advised that in this Act "Assistant" included apprentice, and thus any assistant of full age at the passing of the Act, and who had been engaged in compounding prescriptions for three years, whether as a paid assistant or as an apprentice, would only have to pass the modified examination in order to be registered as a "Chemist and Druggist."

The meeting thanked Mr. Carteighe for his very interesting and clear explanation of the Act.

Concluding Resolutions.

Mr. DEANE, V.P., said that now they had arrived at the conclusion of their

ordinary business, but he had one pleasing duty to perform; it seemed to him but a short time since he had been entrusted with a similar one at their meeting at Dundee. The hospitality of their Norwich friends had been of the most generous description, and everywhere they had received the greatest kindness, the recollection of which would always remain in their memory. As the first President of the Conference no one rejoiced more than he did at witnessing the yearly increasing vigour which it displayed, and the complete success of its annual meetings. He moved the following resolution, viz.:—

"That the most cordial thanks of this meeting be hereby offered to the Norwich members of the Conference generally, and especially to the Local Secretary, Mr. Sutton, for their great and successful efforts to promote the objects of the Conference and the convenience and pleasure of their visitors."

Mr. W. R. King (Bath) seconded the resolution by some remarks highly eulogistic of the hospitality shown by the Norwich members to the strangers.

The President added his testimony to the peculiarly generous reception which they had received from their Norwich brethren, and put the resolution, which was carried with great enthusiasm.

Mr. Caley, in the absence of Mr. Sutton, feelingly acknowledged the motion on behalf of the Norwich members, who, he said, were all delighted at finding that their efforts were regarded as being satisfactory.

Mr. J. D. Smith (Norwich) had great pleasure in asking the meeting to express its recognition of the obligations to their excellent President. Had it only been for his unrivalled opening address they would have owed Mr. Hanbury much gratitude; but he had presided over their meetings with the greatest ability, discrimination, and patience, and to this much of the success of the meeting was due. He moved,—

"That the hearty thanks of the Conference be offered to the President, Mr. Daniel Hanbury, F.R.S., for the ability with which he has fulfilled the obligations of his office.

Mr. Thompson (Norwich) seconded the motion. He was old enough to remember a visit paid to their city by the late Mr. Jacob Bell, who was desirous to promote the union of all members of the drug trade, which now seemed to be an accomplished fact. He was much gratified that their brethren from a distance were likely to take back pleasant reminiscences of the eastern counties.

Mr. Deane put the motion to the meeting, which received it with great applause.

The President acknowledged the vote, and said that the harmony that had prevailed throughout their meetings had made his duties light. It seemed to him plainer than ever that their meetings were productive of much good, both to those who left their homes to attend them, and to those whose towns were visited by fellow-chemists from all parts of the kingdom. This intercourse was good for them all, for it was still true that, "as iron sharpeneth iron, so a man sharpeneth the countenance of his friend."

(*End of the Third Day's Sitting.*)

Fourth Sitting.

The concluding meeting was held on Tuesday, August 25, at 10 A.M.; R. Fitch, Esq., Vice-President, F.S.A., F.G.S., Sheriff of Norwich, in the chair.

Proposed by Mr. Arnold (Norwich), seconded by Mr. King (Bath), and carried *nem. con.* :—

"That the meeting of the British Pharmaceutical Conference for 1869 be held at Exeter, concurrently with the meeting of the British Association for the Advancement of Science."

The following were balloted for and unanimously elected officers of the Conference for the year 1868–9 :—

President.

D. Hanbury, F.R.S., F.L.S., etc., Plough Court, London, E.C.

Vice-Presidents who have filled the office of President.

H. Deane, F.L.S., Clapham Common, S.
Prof. Bentley, F.L.S., M.R.C.S., 17, Bloomsbury Square, London, W.C.

Vice-Presidents.

W. W. Stoddart, F.G.S., Bristol.
J. Ince, F.L.S., F.C.S., etc., London.
G. Cooper, Exeter.
H. S. Evans, F.C.S., London.

Treasurer.

H. B. Brady, F.L.S., F.C.S., Mosley Street, Newcastle-on-Tyne.

General Secretaries.

Prof. Attfield, Ph.D., F.C.S., 17, Bloomsbury Square, London, W.C.
R. Reynolds, F.C.S., Commercial Street, Leeds.

Local Secretary.

Matthew Husband, 95, Fore Street, Exeter.

Committee.

J.H.Atherton, F.C.S., Nottingham.
J. C. Brough, F.C.S , Kensingham.
A. J. Caley, Norwich.
M. Carteighe, F.C.S., London.
T. B. Groves, F.C.S., Weymouth.
J. Palk, Exeter.
R. Parkinson, Ph.D., Bradford.
G. F. Schacht, Clifton.
F. Sutton, F.C.S., Norwich.

Auditors.

E. Arnold, F.C.S., Norwich. G. Cubitt, Norwich.

Professor ATTFIELD, on behalf of his brother officers, fellow-members from a distance, and himself, again thanked the Vice-President, Local Secretary, members of the Local Committee, and other Norwich members, for the cordiality and large-hearted hospitality with which they had been received. The meeting had been successful from all points of view : the papers had been good and numerous ; the discussion on the Pharmacy Act most useful ; the exhibition of pharmaceutical novelties highly interesting. For the first time, in the history of the Conference, local members had invited to their homes, for the whole week, some one or more visitors, treating them with an amount of liberality and friendliness which was scarcely precedented. There was not one of his brother members, from London and other towns, but had spoken in highly laudatory terms of the successful efforts of the Norwich members,—efforts which would render pleasantly memorable this 1868 meeting.

Mr. INCE, in eulogistic terms, spoke of the time and labour which must have been expended in making the arrangements which had been so successfully carried out by the local members. The days had been so pleasantly occupied that neither he nor Mrs. Ince had had opportunity to see one-half of the objects of interest in Norwich, and similar remarks had been made by most of his friends.

Mr. ARNOLD and the CHAIRMAN assured the visitors that the Norwich members had derived perhaps more pleasure and profit than they had conveyed, and hoped that future meetings of the Conference would be still more agreeable and useful than the present gathering.

EXHIBITION OF OBJECTS RELATING TO PHARMACY, HELD AT NORWICH, AUGUST, 1868.

ATTFIELD, PROFESSOR, PH.D., 17, Bloomsbury Square, London.

A set of brass metric decimal weights, as used in the pharmacies of France and other countries; a set of iron metric weights, as used by grocers; a draper's metre measure; a specimen of the jointed metre measures used by carpenters; a 10-metre measuring tape; a set of metric pewter measures, from the double litre to the centilitre; a set of wooden metric measures for seeds, etc., from a decalitre to a decilitre; a set of brass and platinum metric weights, and glass rough and fine metric measures, as used by analytical chemists in all civilized countries; medicine bottles for holding metric decimal quantities; several French prescriptions, illustrating the use of metric decimal weights and volumes.

An album of photographs of prominent members of the Conference.

BAILEY, WILLIAM, AND SON, Wolverhampton.

Sulphur pastilles.

BRITISH SEAWEED COMPANY (Limited), Glasgow.

Pure iodine, iodides of potassium, mercury and lead, bromide of potassium, and lixiviated seaweed char. Specimens remarkable for large size and beauty.

BROUGH, J. C., Kensington.

Differential thermometer for experiments on specific heat.

Products of the decomposition of narcotine, illustrating the recent researches of A. Matthiessen, F.R.S., and G. C. Foster, B.A. (see Paper).

BURROW, W. AND J., Malvern.

Patent metal racks (six in number) for storing mineral waters.

CALEY, A. J., Norwich.

A collection of the extracts of the British Pharmacopœia, neatly arranged for exhibition in glass stoppered bottles; extract of beef made after the process of Liebig and Pettenkofer; concentrated meat tablets.

A refrigerator.

The novelty in construction consists in the ice being placed in the centre of the apparatus in a perforated zinc chamber, with receiver for water.

A large quantity of aerated waters for the use of members.

CASELLA, MR. L., Hatton Garden, London.

A standard mural yard-and-metre measure on glazed porcelain mounted in mahogany.

CHAPMAN AND CO., St. James's Mills, Hatcham, near London.

Entire wheat flour and powdered bran, for use in diabetes.

COLEMAN, W. J., AND Co., 13, St. Mary-at-Hill, London, and Bury St. Edmund's.

A large collection of drugs and chemicals manufactured by Messrs. Gehe and Co., Dresden. The collection includes a very large specimen of valerianate of quinine in magnificent crystals; beautiful specimens of the sulphates of cadmium, of cobalt and of manganese, of permanganate of potash in large quantities and finely crystallized; caffeine obtained from tea, a large specimen most beautifully crystallized; subnitrate of bismuth; acetate and muriate of morphia; tannic acid; acetate and nitrate of uranium; cubebine. Essential oils of mustard, patchouly, carraway, fennel and sandal wood, also croton oil.

Extracts of opium, aloes, cinchona and nux vomica. These were in a novel form, the extracts being completely dry and in small regular pieces about an eighth of an inch in diameter. Extract of malt also in small pieces, prepared according to Liebig's formula. Extract of alkanet as a thick semifluid substance, used for colouring oil, etc.

Cut roots, as those of gentian and sarsaparilla, the latter in very even transverse slices of about $\frac{1}{10}$ of an inch in thickness. Decorticated roots of calamus aromaticus, marshmallow, and orris. Powdered ipecacuanha in two forms, one powder being that of the entire root, the other consisting of the cortical portion only. Pure gutta-percha prepared by solution in chloroform, bleaching and rolling into sticks, and used chiefly for stopping teeth.

Liebig's extract of meat, manufactured in Australia. Various preparations of it, as biscuits, lozenges, soups, jelly, and extract of meat, coffee, and cocoa.

Mustard seeds and mustard of various kinds manufactured therefrom.

Russian and Brazilian isinglass, both in the crude state and cut for use.

DOULTON AND Co., London.

Stoneware stills, receivers, percolators, evaporating dishes, funnels, etc., adapted for chemical and pharmaceutical operations. Crucibles of various kinds, earthen furnace.

EVANS, LESCHER, AND EVANS, London and Liverpool.

Patent valvular tap for filling accurately measured doses of medicine into membranous envelopes or capsules of Savaresse.

The operation of this little invention is very simple. The lever of a three-way tap opens a communication between the reservoir and a hollow cylinder of required capacity in which a plunger is made to work airtight; by means of a connecting link, the continued upward action of the lever elevates the plunger, drawing with it the fluid to be measured: the height to which this plunger can be raised is determined by a set screw, and this regulates the quantity to be measured.

The downward action of the lever first opens a way between the cylinder and the exit, and its continued action depresses the plunger, forcing out the measured quantity; the continued upward and downward motion of the lever thus drawing at each action accurately uniform quantities.

The invention is applicable to a variety of uses.

EWEN, JAMES, 17, Garlick Hill, London.

Clarified lard, clarified marrow, and clarified suet; benzoated lard; purified olive oil, purified trotter oil, and benzoated trotter oil.

GROVES, T. B., Weymouth.

Cynanchum bitter, cathartate of ammonia, senna resin and extractive; liquor senna (see Paper). Granular effervescing phosphate of potash, ol. sambuci; liquor opii sedativus.

HANBURY, D., Plough Court, Lombard Street, London.

Calumba root of fine quality, obtained from roots grown in Mauritius, and sliced and dried in England; fresh calumba roots from the Botanical Garden, Trinidad, West Indies; jalap (sliced and dried) grown at Ootacamund, near Madras, from roots originally obtained from Mexico; stearoptene of attar of rose.

Copy of the 'Pharmacopœia of India,' edited by Dr. Waring, 1868, and of Ferreira's 'Hydrologie Générale,' Paris, 1867.

HARVEY, REYNOLDS AND Co., Leeds.

Extractum carnis, from English beef. Dr. Clifford Allbutt's short clinical thermometer (self-registering). Dr. Edwyn Andrew's twin case for a pair of short chemical thermometers.

HEARON, SQUIRE, AND FRANCIS, Coleman Street, London.

Fine specimen of black wax imported from Madras (see Pharm. Journ. July, 1868). Mass of myrrh of unusual size.

Bael fruit, sumbul root, grey Cinchona bark from India, Tampico jalap, Vera Cruz jalap, Calabar beans, root of *Veratrum viride*, adulterated saffron, containing 20 per cent. chalk, cacao butter.

Benzoate and phosphate of ammonia, carbonate of bismuth, crystallized carbolic acid (pure).

Specimens of the preparations of the Brit. Pharm., namely :—

Charta epispastica, glycerines of carbolic, gallic, and tannic acids; flexible collodion, liniment of iodide of potassium, liquor bismuthi et ammon. cit., lin. sinapis comp., ext. of Calabar bean; ethereal ext. of mezereon, emp. plumb. iodid., emp. cerati saponis; mist. sennæ comp.; tinct. sumbul, tinct. verat. viridis, liq. ferri perchlor.; vin. quinæ; vin. ferri cit.; vin. aurantii, benzoated lard, sodæ citro-tartras effervescens.

HOWARDS AND SONS, Stratford, near London.

Hydrate of quinine crystallized from benzole, kinate, hydrobromate, chlorate and sulphate of quinine; sulphate and hydriodate of quinidine; sulphate, hydrobromate, hydriodate and chlorate of cinchonine. Potassio-tartrate of soda and citric acid, both in exceedingly perfect crystals.

Bark of *Cinchona succirubra*, grown in India and imported in 1867.

The hydriodates of quinidine and of cinchonine are crystallizable salts, and recommended for medicinal use in preference to the corresponding salt of quinine.

INCE, JOSEPH, London.

Old engravings, portraits, manuscripts, and pamphlets, illustrating English pharmacy in the eighteenth century.

LAIRD, WILLIAM, Dundee.

Specimens of sweet spirit nitre, annatto, and white gutta percha, in illustrations of papers read.

MARTIN, F. R., Redland, Bristol.

An excellent collection of alkaloids and metallic salts, 66 in number. A large and interesting series of microscopic specimens.

MOTTERSHEAD AND Co., Manchester.

Specimens of "torn," "purified," and "rolled" (white) Gutta Percha,—used for filling decayed teeth.

PROCTOR AND SON, Newcastle-on-Tyne.

Siphon medicine glasses for the use of adults and infants (see Paper).

REYNOLDSON, —, Newcastle-on-Tyne.

Ingenious automatic apparatus for washing precipitates (see Communication by Mr. Brady).

ROGERS, CHARLES, Eye and Ear Hospital, Birmingham.
Contrivance to illustrate a new method of tying over and securing corks and stoppers in bottles; a capsule to prevent accidental poisoning on the principle of arresting the attention of the person using the bottle. Box of jewellery powder.

SCHACHT, G. F., Clifton.
Australian bismuth ore.
This ore is highly cuprous, and is probably the source of the cuprous metallic bismuth that has of late been frequently found in commerce.
Crystallized metallic bismuth, a fine specimen. Liquor bismuthi.

SILVERLOCK, H., London.
Specimens of labels specially adapted for poisonous substances, some of them tinted and of novel design.

SPENCER, Mr., Burnham Market, Norfolk.
English opium, a large mass weighing three pounds, collected at Burnham Westgate, Norfolk, by the late Sir Roger Martin.

STOCKER, A. S., Artillery Street, Horselydown.
Improved feeding-bottle.

SUTTON, FRANCIS, Norwich.
Various glass retorts, test tubes, flasks, beakers, and other glass apparatus employed for general chemical purposes.
A complete collection of graduated instruments for volumetric analysis, including some very elegant stoppered burettes and pipettes with revolving stands.
Standard volumetric solutions of the British Pharmacopœia.

TOMLINSON, MATTHEW, Hulme, Manchester.
Specie jar 24 inches high, with glass cover and mahogany stand; glass panelled soda-water stand with ornamental plate-glass top.

VAN ABBOTT, GEORGE, London.
Foods and wines specially suited for invalids; food for infants.

WILSON, B. O. AND G. C., Boston, U.S.
Compressed and dried medicinal herbs in small packets. These specimens are remarkable for their good colour and fragrance. They include peppermint, spearmint, pennyroyal, horehound, tansy, feverfew, wormwood, wintergreen, raspberry leaves, flowers of *Sambucus canadensis*, sage, summer savory, etc.

YATES, JAMES, F.R.S., Highgate.
Measures and weights illustrating the metric system, together with books, pamphlets, and a chart bearing on the subject. The collection includes a metallic half-metre, very finely graduated, and sent for exhibition at the Norwich Meeting of the British Association by the makers, Messrs. Darling, Brown, and Sharpe, Providence, Rhode Island.
Male flowers, fruits and leaf of *Cycas revoluta*, and coloured drawings of the plant.

Dr. MATTHIESSEN also kindly sent for exhibition a *liquid* alloy of potassium and sodium. Its appearance was identical with that of mercury; its specific gravity was about ·80, and it was protected by immersion in a sealed tube filled up by a liquid hydrocarbon.

ORIGINAL AND EXTRACTED ARTICLES.

ON THE TINCTURES OF CATECHU, KINO, AND KRAMERIA OF THE BRITISH PHARMACOPŒIA.

BY WALTER G. SMITH, M.B. T.C.D.,

ASSISTANT PHYSICIAN TO THE ADELAIDE HOSPITAL, DUBLIN.

In the first edition of the British Pharmacopœia, published in 1864, fifty-six tinctures were included in the body of the work, and in the last edition (1867), nine new members have been added to this class, thus extending the list to sixty-five.

When the large number and great variety in the characters and properties of this important galenical group are considered, it appears of some moment to examine them in detail in order to ascertain whether they can be readily distinguished by means easily applied and promptly executed.

That the tinctures can be distinguished one from another I have to a certain extent ascertained by numerous experiments, but as I am not yet prepared to enter on the consideration of the entire group, I shall at present direct attention only to what may be termed a natural trio, so closely related to each as are the tinctures of catechu, kino, and rhatany.

The late Professor Guibourt, in his 'Histoire Abrégée des Drogues simples,' 3me. édit. t. ii. p. 434, Paris, 1836, gives a comparative table of the action of the ten following reagents :—litmus, alcohol, lime-water, nitric acid, gelatine, sulphate of iron, tartar emetic, acetate of lead, oxalate of ammonia, and nitrate of barium, on solutions obtained by treating with twenty-four parts of boiling water, two kinds of catechu, three of kino, and one of krameria.

Very little as regards their distinctive characters can be deduced from his elaborate table, and it would require the skill of a careful experimenter to distinguish the three astringents by the tests he employed.

It will be convenient, as a preliminary, to give in a tabular form the mode of preparation of the three tinctures as enjoined by the British Pharmacopœia.

Tinctures.	Ingredients.	Strength.	Prepared by.
Catechu . .	Pale Catechu . . . . oz. 2½ Cinnamon Bark . . . . oz. 1 Proof spirit . . . . . pint 1	1 in 8	Maceration
Kino . . .	Kino . . . . . oz. 2 Rectified spirit . . . . pint 1	1 in 10	Maceration.
Krameria . .	Rhatany root . . . . oz. 2½ Proof spirit . . . . . pint 1	1 in 8	Maceration and percolation.

The mode by which I propose to distinguish these tinctures is based on their behaviour when diluted with distilled water in a test-tube half an inch in diameter, and on the result of evaporating a few drops of each tincture on glass.

It is important to mention that the tinctures experimented on have been derived from three distinct sources, each of them independent establishments, and whose reputation is a guarantee of the purity of their preparations; one, an eminent London house, the other two, well known in Dublin.

In the case of tincture of kino especially, it is necessary that a fresh

specimen should be selected for experiment, for it is well known that this tincture frequently becomes gelatinous if kept, and deteriorates in quality. If the air be excluded the tincture keeps for a long time without undergoing change, therefore the U. S. Pharmacopœia directs that "This tincture should be renewed frequently, and kept in closely stopped bottles."

Though the exact chemical decomposition which occurs has, up to this, eluded explanation, the change is possibly due to slow oxidation, and according to Dorvault, the jelly consists of pectic acid (L'Officine de Pharm. Prat., Paris, 1847, p. 309).

Pereira suggests that when this tincture solidifies, the Botany Bay kino (inspissated juice of *Eucalyptus resinifera*) had been employed. (4th edit. vol. ii. part ii. p. 327.) Even tincture of catechu is said sometimes to gelatinize when kept; similarly also, tincture of rhatany, according to F. Boudet and others. (Journ. de Pharm. 3 sér. i. 338.) In my first experiments the tinctures * were mixed with an equal volume of distilled water, and the results were noted, which, however, were not satisfactory, for all the tinctures were rendered opaque, the tint varying from light brown to the colour of dark porter.

In subsequent experiments each tincture was diluted with seven volumes† of distilled water, and it was then observed that while tincture of kino yielded an abundant flocculent precipitate, the tincture of catechu assumed a dark garnet-red, and the tincture of rhatany a bright garnet-red. But these two latter are easily distinguished at a glance, for tincture of rhatany remains permanently transparent by reflected and transmitted light, and tincture of catechu, on the contrary, is opaque by reflected light from the first, and on standing for some hours becomes equally so by transmitted light. The results obtained by allowing a few drops of each tincture to evaporate spontaneously in watch-glasses are also individually characteristic, and are more easily judged of by the eye than conveyed by description.

The tabular view on page 245 will exhibit more clearly their distinctive characters.

Column I. represents the characters of the specimens obtained from London, and Column II. those of the specimens furnished by Dublin, and which coincided essentially with each other.

Some discrepancies were observed in the course of the experiments, which require a few words of comment.

The results, for instance, of evaporating the samples of tincture of catechu are seen to be strikingly different, but are, I think, easily explained by a reference to the varieties of catechu in the market.

The tincture of *Catechu pallidum* (the only officinal kind), when the spirit is driven off, leaves an opaque residue; but that of *Catechu nigrum* (which is probably often substituted for it) leaves a transparent residuum. (See Table.)

Here, then, we have an easy criterion of judging whether, in any given case, the directions of the British Pharmacopœia are complied with or not, as regards the preparation of this tincture.‡

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* As none of these tinctures were freshly made, and they had all been constantly exposed to direct sunlight for some time, it is quite possible that they may have undergone some change attended with an alteration in properties.

† Seven volumes of water were preferred, among other reasons, because many tinctures are prescribed in the proportion of one fluid drachm in one fluid ounce as a draught or in a mixture.

‡ I obtained a specimen of the catechu used by one of the Dublin houses (Column II.) in the preparation of the tincture, and found it to answer to the variety of *Acacia Catechu*, U.S., described by Dr. Wood as plano-convex or cake catechu.

	Colour, etc.		Diluted with Seven Volumes of Water.	
	I.	II.	I.	II.
Tinct. Catechu	Opaque, dark reddish-brown On evaporation, leaves an opaque, dull brick-red deposit.	Opaque, dark reddish-brown Leaves a transparent, smoke-brown deposit after evaporation.	Dark garnet-red, opaque by reflected light. Froth persistent, tinged with red. No precipitate on standing for 24 hours.	Dark garnet-red, opaque by reflected light. Froth persistent, nearly white. Copious dark chocolate precipitate after 24 hours; fluid garnet-red.
Tinct. Kino	Very dark garnet-red. When evaporated, leaves a transparent purplish-red film.	Opaque, reddish-brown. Leaves a transparent purplish-red deposit on evaporation.	Bright garnet-red by transmitted and reflected light.	Abundant flocculent precicitate, which, on subsiding, leaves the fluid garnet-red.
Tinct. Krameriæ	Very dark garnet-red. Evaporated, it leaves an opaque brick-red deposit.	Nearly opaque, reddish-brown On evaporation, leaves an opaque brick-red deposit.	Froth rapidly disappears. No change after 24 hours. *Pale bright garnet-red by transmitted and reflected light. Froth persistent, tinged with red. No change after 24 hours.	Froth persistent, reddish-brown. Pale bright garnet-red by transmitted and reflected light. Froth persistent, tinged with red. No change after 24 hours.†

The contrast, also, in the behaviour of tincture of kino, specimens I. and II., when mixed with water, deserves notice; and I am not as yet prepared to say to what this difference may be due, possibly to distinct kinds of kino having been employed. Wood states that the tincture of kino is not disturbed by water (U. S. Dispens. p. 496, 12th ed.).

The construction of such tables as the above involves greater difficulties than are apparent at first sight, and which will be best understood by those who have made similar attempts. Though the experiments have been frequently and carefully performed, I scarcely expect that all who repeat them will arrive at precisely the same results. The differences in quality of the same article and the indifferent employment of distinct varieties of some drugs in their preparations are serious obstacles to the attainment of definite and exact conclusions.

Moreover, differences in colour, and to some extent in properties, may be

* An old specimen in the Museum, T. C. D., was rendered opaque and of a rich chocolate-brown on dilution with seven parts of water.

† Sometimes it becomes dull red by reflected light.

ascribed, in part at least, to the use of percolation in one case and maceration in another. But as regards this point, which requires some elucidation, I hope to enter into more detail at another time, and merely throw it out as a suggestion at present.

Still, such a method of distinguishing these three tinctures recommends itself by its simplicity and readiness of application, and serves our purpose far more effectually than the copious table of tests recorded in Guibourt's work.

ON A NEW PREPARATION OF LUPULINE.

BY DYCE DUCKWORTH, M.D.

MEDICAL TUTOR, ST. BARTHOLOMEW'S HOSPITAL.

It is certainly remarkable that this drug has not found a place in the new Pharmacopœia of this country. It may, however, be said that it is not altogether ignored, inasmuch as it is expected to be present in the hops as ordinarily employed. It is not too much to assert, that the amount of it in different samples varies considerably, and it is certain that this peculiar powdery matter represents the active principles of the entire strobili in a concentrated form.

It seems always desirable to possess the most powerful and concentrated preparations of the vegetable Materia Medica, and, as no available active principle has as yet been separated from the hop, it should, in the meantime, be the endeavour of the pharmaceutist to obtain, and the physician to employ the drug in its most complete and essential form. Hence I conceive that at least one preparation of lupuline should be in use. The powder itself is inconvenient,—from seven to twelve grains are requisite for a dose, and it must be given in the form of pill. In this way, too, an amount of lignin and other inert principles are ingested, which it is not desirable to employ, and which, in certain cases of gastric disease, would be positively harmful.

This substance appears to be most fully appreciated in the United States of America. In the authorized codex of that country I find there are no fewer than three preparations of it, viz. a tincture, prepared with rectified spirit; a liquid extract (corresponding in strength to those of the Ph. Brit., viz. part for part); and an oleo-resin. The French codex takes no notice of it. In the Edinburgh Pharmacopœia there was a tincture made with rectified spirit, and lupuline was officinal in the Dublin Pharmacopœia.

During a recent series of pharmaceutical experiments with the powder, I was constantly struck with the remarkable valerian-like odour evolved from the different preparations, and I was much interested to find, in the course of subsequent reading on the subject, that M. Personne had discovered valerianic acid in lupuline. (*Comptes Rendus*, 1854.)

In none of the British Pharmacopœia preparations of hop, except the extract, can it be said that the real strength of the drug is removed. The tincture made with proof spirit, which does not thoroughly exhaust the active parts of the scales of lupuline, and the watery infusion can but inadequately represent the virtues of this medicine.

The extract of hops, as prepared partly with spirit, like the extract of jalap, has the advantage of containing some resin and volatile oil. It is the presence in so considerable an amount of resin, gum, and wax in lupuline that renders it important to select a proper solvent, and, therefore, proof spirit and water respectively are incapable of acting thoroughly upon it. We may indeed practically regard lupuline as a gum-resin, and to treat it pharmaceuti-

cally with success, we must apply the same solvents as we do in the cases of drugs of that class.

The preparations in the United States codex are arranged with due regard to this point, and, in recommending these to more careful notice in England, I should have little or nothing to add, were it not that I believe I have observed the fact that the aromatic spirit of ammonia is a better solvent of this substance than any other yet proposed. The American tincture and fluid extract are prepared with rectified spirit, and the oleo-resin, as in the case of *Filix-mas*, is procured by means of æther. The two former turn milky on the addition of water, and, what is more noteworthy, cast off the resin they hold in solution, which appears as a film on the surface of the mixture. This resin I find cannot be taken up again by adding excess of alkalies, such as liquor potassæ, bicarbonate of soda, or aromatic spirit of ammonia. If, however, either of these preparations be put into a dry vessel, and about an equal bulk of spiritus ammoniæ aromatici is mixed with it, and water subsequently be added, a good solution is formed, pleasant-looking, though not quite clear. I have devised another preparation which, I think, will prove most useful whenever it is desired to use the hop. It is an ammoniated tincture, and should be made in the same way as the other ammoniated tinctures of the Pharmacopœia. Like valerian, which also contains an oil and a resin, lupuline is best exhausted by the aromatic spirit of ammonia, and the reason for this appears to be that this preparation contains the combination of alkali and rectified spirit necessary to the solution of the various elements in these drugs. Certainly no agent that I have tried extracts the virtues of lupuline so well as sal-volatile. The result is a strong richly-coloured tincture. Neither rectified spirit, æther, nor, of course, proof spirit produce so strong a preparation.* I recommend the following formula:—Lupuline, 2 oz., spir. ammon. arom., a pint: macerate for seven days, agitating occasionally, then filter and add sufficient of the menstruum to make up to a pint.† The dose of this is from ♏ 20 to fl. ʒj. I propose to call it "tinctura lupulinæ ammoniata."

I have no hesitation in directing attention to this preparation of the hop as the best we at present possess. According to Christison, the dose of tinctura lupuli should be fl. ʒj to fl. ʒiss to produce any hypnotic effect; the ordinary dose consists of as many drachms. Dr. Ives, of New York, states that the tincture of lupuline is an effectual hypnotic in restlessness, the result of nervous irritability, and in delirium tremens.‡ Some advantage, too, is derived from the presence of ammonia in considerable quantity, and this whether the preparation be exhibited as a hypnotic, or as a tonic combination of bitter and ammonia.

CHINA RHUBARB.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—In the report of the Pharmaceutical Conference, Norwich, remarks are made concerning China rhubarb, by which it might be inferred that its

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* According to Royle, the active properties of lupuline are completely extracted by spirit. I am inclined to doubt this. He recommends a tincture of it, however, in preference to tinct. lupuli.

† A specimen of it was exhibited in the Annual Museum of the British Medical Association at Oxford, in August last. Mr. Hall, of Wigmore Street, who made this for me, recommends that percolation should not be employed.

‡ *Vide* American Codex, also Nevins' Transl. of Lond. Pharm. 1851.

excellence had permanently decreased, and the English root with advantage be substituted. Allow me to state that, although the consumption of English rhubarb is very great, it is chiefly exported in the form of powders, and very rarely indeed used in England, its bright colour chiefly recommending it in the foreign market. To its inertness as a stomachic, I dare say most medical men can certify. It is satisfactory to know that, although the whole of the crops of China rhubarb were some few years since destroyed (perhaps, as reported, by the Taepings), thus causing a deficient supply, and a consequent rise in price, and the root not yet presenting that sound appearance and ripe condition which only mature growth and skilful desiccation can effect, it is evidently recovering itself; and I doubt not before long the celebrated Russian rhubarb will appear in the market, to assure us that the China stores of this drug have attained their former excellence. I have examined some hundreds of chests within the last few months, and can therefore truthfully attest to this gradual improvement, and which declining prices will very much promote. I have now before me an exceedingly fine sample of Usher's English rhubarb, and one of the China rhubarb lately imported, and, irrespective of colour, the latter has by far the superiority, being astringent and with every peculiarity for which rhubarb is esteemed, and which can never be attained by any culture in a climate so cold and erratic as our own.

I am, Sir, your obedient servant,

CHARLES W. JAYNE.

102, *Leadenhall Street, London, E.C., Sept. 8th*, 1868.

[We hardly think any one would intend it to be inferred that the quality of China Rhubarb had *permanently* declined. That it *has* declined all admit, yet that it may improve (and even has) there is no reason to doubt.

We do not, however, concur with our correspondent in thinking that the particular sort known as *Russian Rhubarb* will re-appear, seeing that the inspection of the drug by the agents of the Russian Government has been abandoned. It was this inspection and the concomitant destruction of inferior qualities, that caused the uniform excellence of the so-called *Russian Rhubarb*.—ED. PH. J.]

COMMERCIAL ACONITINE.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—We beg to hand you a translation of a paper on aconitine, received from Mr. Merck, of Darmstadt. It refers to a sample which we had sent to Mr. Merck, and which we had received from a first-class house here. The extraordinarily low price at which this preparation is being sold lately in London induced us to have it examined, and we doubt not that the result will prove of interest to your readers.

We remain, Sir, your most obedient servants,

ROLLER AND WIDENMANN.

3, *Love Lane, Eastcheap, London, Sept.* 7, 1868.

The sample of aconitine received from London differs as against my preparation, *id est* the officinal aconitine, in the following points:—The pure officinal aconitine is readily soluble in ether, alcohol, and chloroform, and from these solutions it is obtainable only in an amorphous resinous mass, but by no means in crystalline form. In boiling water it becomes soft, and can be kneaded. Its reaction is decidedly alkaline.

The English aconitine, on the other hand, is but *slightly soluble in ether*, and also much less soluble in alcohol than the pure aconitine; from its solution in boiling alcohol it crystallizes readily on cooling. It is also difficultly soluble in chloroform, and in boiling water it does not become soft, but remains in a pulverulent condition. Its reaction is less alkaline.

If the aconitine in question be prepared from aconitine root (which there is no cause to doubt), it is probably identical with aconelline or napelline, since both these bodies are found in the aconite root, and they are very similar in properties to the sample in question. On no account, however, can the latter be accepted as pure aconitine.

According to experiments made at Paris with the various aconitines of commerce, the crystalline body is far less active than the amorphous aconitine.

HINTS TO YOUNG MEN IN THE TRADE.

The present time seems suitable for addressing a few remarks to our young men, especially as the Pharmacy Bill is drawing attention to the qualification of chemists. Great diversities of opinion exist in some minds as to the necessity of such a superior training; in fact, some have said that such extra training and scholarship spoil a man for business. It is to try and upset these opinions that the following views are expressed.

Some have great faith in unions and societies for improving trade; and societies *may*, in some cases, be of service; but the time has arrived for our young men entering the trade to have correct views, as how *much* or how little a society can do. Many of us at times are apt to be like the quack politicians of our day, who think they can settle all the affairs of the nation with accuracy and ease, and yet rarely manage their own affairs with success.

If their own special business goes wrong—if their gardens and farms are neglected; if their crops are bad, and if things in general are not exactly what they wish,—they blame the Government, and look to the next election as a remedy for everything. The real error in those men is this: that they expect far too *much* from *Government*, and far too *little* from themselves. Now without wishing to give any one the slightest offence, it does appear as if some of us held similar sentiments, if we look from a Pharmaceutical point of view. Are we not all, at times, too apt to expect too much from societies and organizations? There is no doubt that they have their special purposes to fulfil, and advantages to confer; but it is necessary for every individual member of *any* society to exercise common-sense views about organizations. It does not follow, that because we unite ourselves to any body of men, the simple fact of being in connection with them makes us better men. It does not follow that *mere* union of any kind will at once, as if by some magical influence, improve our returns and fill our coffers with gold. Golden dreams of this sort may pervade *some* minds; but such utopian ideas are not in harmony with the practical notions of the present day.

It must be very disheartening to young pharmaceutical students to be told that after all their studies and anxieties, they are simply rendering themselves more *unfit* to fill situations. Such a doctrine as this must be an error. As a general rule, it is rather the intelligent and well-disciplined student who is ultimately the most successful in the battle of life. His studies expand his mind in every direction. If he be a good student, his training will have developed the habits of *carefulness*, *perseverance*, *thoughtfulness*, and unflinching industry. Was Scheele a worse business man because he was such an industrious student? Was Stephenson a worse workman because he spent so much of

his time in trying to unravel the mysteries of science? Or was Franklin a worse tradesman because he discovered that thunder and lightning were only the terrible phenomena of electricity; and who, when engaged in scientific pursuits, still had the good sense and humility to wheel his own goods in a barrow through the streets of Philadelphia to his own shop?

"*Knowledge is power*," not only in the higher walks of life, but even to the humblest tradesman; and the *greater* the knowledge, the greater the power. Young students, take courage and work hard, for intelligent men must of necessity receive the greatest preference in the future. Let *self-dependence* and *improvement* be your thorough determination.

At the same time, to lessen the force of objections, always strive to combine with the highest scientific attainments good business and moral habits. An eminent statesman has remarked, that we *ask* the opinions of *intellectual* men, but we *follow* the advice of men of *character*.

An idea prevails that a member of the Pharmaceutical Society gets nothing but the Journal for his guinea: suppose this to be true, the Journal itself is worth the money to any man who has a taste for his business. The highest idea connected with the subject, however, is, that the founders of the Society had loftier motives than self-aggrandizement. Their motive was how they could secure permanent advantage to those who were to follow them; and although many of us may feel to a certain extent isolated from the more immediate advantages which are enjoyed by those in London, yet we are just receiving as much pleasure and profit as it is possible under the circumstances to obtain from any institution of a like kind. If the Journal be not worth a guinea, it is a satisfaction and honour to feel that the few shillings thus spent can uphold such a noble institution as exists at present in London for the education of young chemists. It ought to be the ambition of every young man now entering the trade to try and prepare himself for examination, even for his own satisfaction, if nothing else. The opinions of both friends and foes to the Pharmaceutical Society culminate in the fact that there must be education, and an examination test for the future; and whatever means of training of a similar kind which may spring up, none can arise that will be able to show in its founders, greater sympathy, disinterestedness, benevolence, and desire to benefit the young men in the trade. Young men who enter the business now should ponder well before taking the step, and instead of trying to *evade* the necessary studies, they should lay themselves out to *master* the various branches required, and they would never have cause to regret the ordeal. Where self-dependence, energy, industry, and indomitable perseverance are the guiding principles of any young man, he will seldom have occasion (unless under very peculiar circumstances) to retreat. At the same time, it should always be borne in mind that any man can do far more for himself than any society or master can do for him. It is not to be wished that combinations of men are to be undervalued; but there is a great difference between undervaluing and overvaluing them. It is pleasant for brethren to unite for the common welfare of each other, and for the protection of each other's interests; and it was this very principle which actuated the founders of the Pharmaceutical Society.

To organize, therefore, and to train the mind to the highest pitch is not only right, but it is our duty, for the sake of others as well as ourselves; but, after all, there is a sort of moral culture required to teach the proper use of organizations and intellectual attainments. This moral culture would develope *all* the qualities of the *man;* so that he would never consider himself as above his work. To be a first-class worker is the highest achievement, and to be a first-class worker requires the highest mental and moral culture; and nothing short of this will give public satisfaction. Men so trained would be above advancing their business by fibbing advertisements of cures for *every*

disease, "Indian Brandee" dodges, etc. etc. The chemists of the future are expected to be *men* in every respect,—men who shall conduct their business on sound and right principles, and who will in a special *manner* throw *character* into all they do.

J. S. T. W. Smith.

Hexham, August 24, 1868.

THE PHARMACEUTICAL AND POISONS BILL.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—At length the two great objects for which Chemists have so long laboured and contended have been secured, viz. the management of our own business free from hostile interference and control, and the satisfactory examination by our own body of every future chemist entering upon the profession. No doubt many assistants will be somewhat disappointed that their exemption from examination was struck out of the Bill; and not without some just reason, seeing that all present chemists are exempt. But there can be no doubt that all these men will be, and ought to be, very considerately dealt with; and after their cases are leniently disposed of, it will be to the interests of all parties concerned and of the public especially to admit none into our ranks but men of superior qualifications and fitness. Up to this time we have often been abused and insulted as to our defective attainments, and the sooner we wipe away all grounds of accusation on these points the better for ourselves and others. One duty of the Council will be at once important and urgent, that is, to see that the men who apply for registration are *bonâ fide* entitled to admission; there can be no doubt that scores, perhaps hundreds, will make application, who, according to the law have no title to admission whatever, and in every case of this kind, it will be a plain dereliction of duty to admit them. There are many minor points yet to be settled, and to my own mind, some passages in the new enactment will bear different and conflicting constructions. Would it not be desirable to have one general meeting of chemists in London, and other local meetings, to congratulate one another, and to discuss some of the doubtful and unsettled points, with a view to closer union and concord for the future; especially as to any further alterations in the Parliamentary or bye-laws, by which we shall now be governed? As a country member, I feel the Pharmaceutical Society, and the chemists generally, are so deeply indebted to the Metropolitan members of the Council, I should greatly regret (and I firmly believe it would be immensely to our disadvantage) to see more than seven country members admitted to the Council. None but London members on the spot could ever have commanded the influence, or accomplished what has been already done for the Society and the trade generally. It does, however, appear desirable, if possible, that something should be known beforehand of the future candidates for the Council. Hundreds of members in the country have to vote for or reject names, the relative merits of which they have no means of deciding upon. Is there no way of obviating this difficulty? The great changes which the new law will ultimately bring about, will certainly necessitate some, possibly many alterations and adaptations in the bye-laws, and it would be a great advantage if opportunity could be given for full and free friendly prior discussion to any proposed amendments.

The clause in the new bill respecting compounding medicines containing

classified poisons, appears to me badly constructed. Are these medicines to be entered in the Poison Book, and are they to be labelled "Poison"? I do not so understand the clause myself, but that it refers only to copying in the prescription book. Yet, there is certainly some ambiguity, and if by any means the first construction could be put upon it, an early alteration of the clause would be imperatively demanded. Again, application of the laws against the adulteration of food to such a complicated business as ours, holding the retailer only and not the manufacturer responsible, if fully acted upon, may be made an instrument of cruel and unjust oppression. But no doubt full explanation of all the clauses will be given by competent persons.

I am, Sir, yours truly,

JOSEPH BALL.

METALLIC BISMUTH.

As a proof that *pure* metallic bismuth is not quite so easily procured as Dr. Redwood, in his August note, asserts, I beg to send the copy of a letter received a few days ago, in the ordinary course of business, from one of the most extensive metal refiners of London.

"To Mr. Schacht, Clifton.

"Sir,—We much regret we cannot at present execute your order for pure bismuth. All we have contains traces of copper, and we are the only holders in London," etc. etc.

It is pretty clear from this that the ability to procure this metal pure in commercial quantities does not depend, as Dr. Redwood insinuates, upon the willingness of the purchaser "to pay the price for it."

G. F. SCHACHT.

September 21, 1868.

[If *chemical purity* be required, the difficulty of obtaining it is not confined to bismuth. No commercial articles used in medicine are free from *traces* of impurity, nor is it necessary that they should be.—ED. PHARM. JOURN.]

THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The thirty-eighth annual meeting of the British Association commenced its proceedings at Norwich, on Wednesday the 19th of August, at one o'clock, in St. Peter's Hall. In the evening the Duke of Buccleuch resigned the presidential chair to Dr. Hooker, who then delivered the annual address; deviating from the usual custom of reviewing the progress of the sciences, and confining himself mainly to his own special department.

At the general meeting the minutes of the previous meeting were confirmed and the various reports read. The attendance was numerous, 1700 having assembled in the hall.

The officers of the Chemical Section were:—

President.—Prof. Frankland.

Vice-Presidents.—Sir B. Brodie, Warren De la Rue, Dr. Gladstone, Prof. Liveing, Prof. W. A. Miller, Prof. Odling, Prof. Roscoe, Dr. Stenhouse, Prof. Williamson.

Secretaries.—Dr. Crum Brown, Dr. Russell, F. Sutton.

Committee.—Prof. Attfield, J. H. Atherton, H. B. Brady, J. C. Brough, J. G. Barford, W. Crookes, A. R. Catton, F. C. Calvert, A. Fletcher, J. R. Gassiot, G. Gladstone, T. B. Groves, A. Gamgee, F. Guthrie, Rev. R. Kerwan, H. Macleod, E. J. Mills, Prof. Aug. Morren, W. Perkin, B. Paul, J. Chandler Roberts, W. L. Scott, J. Spiller, E. C. Stanford, Angus Smith, Hon. A. Strutt, W. Thorpe, C. Tomlinson, P. J. Worsley.

The following is a list of the papers read in this Section :—

W. H. Perkin, F.R.S.—On the Chloride of Methylene formed by the action of Nascent Hydrogen on Chloroform. Dr. T. L. Phipson—On Sulphocyanide of Ammonium. Dr. J. H. Gladstone—Refraction Equivalents and Chemical Theories. C. Tomlinson, F.R.S.—On the Action of Nuclei in Inducing Crystallization. F. A. Abel, F.R.S.—On the Chemical Composition of the great Cannon of Mohammed II., recently presented by the Sultan Aziz Khan to the British Government. John Spiller, F.C.S.—Analysis of the ancient Roman Mortar of the Castrum of Burgh, Suffolk. Alfred R. Catton—Report of Synthetical Researches on Organic Acids. A. Matthiessen—Report on the Chemical Nature of Cast Iron. A. Matthiessen and W. J. Russell—Note on the Vesicular Structure of Copper. E. Frankland—On the Combustion of Gases under pressure. W. Perkin—On the Preparation of Anhydrous Salts of Some Organic Compounds.—Meusel —On Paraffin and its Products of Oxidation. Alfred R. Catton—Notes on Löwig's Researches on the Action of Sodium Amalgam on Oxalic Ether. C. W. Siemens—On Puddling Iron. Otto Richter—On a System of Chemical Philosophy. T. Wood—On Chemistry as a Branch of Education. E. Meusel and C. H. Gill—On Paraffin and its Products of Oxidation. E. Meusel—On the Physical Properties of Two Coloured Compounds. A. R. Catton—Note on Löwig's Researches on the Action of Sodium Amalgam on Oxalic Ether. Angus Smith—On the Absorption of Gases by Charcoal. J. Dewar —On Coal-Tar Bases. T. Fairley—Report on the Polyatomic Cyanides. J. Dewar— On Kekule's Model to illustrate Graphic Formulæ. W. Ditmar—On Vapour Tensions. Ludwig Mond—On the Manufacture of Sulphur from Alkali Waste in Great Britain. R. Gerstl—Different Spectra of one Chromium Salt. J. A. Wanklyn—A Note on Sea Water. J. A. Wanklyn—Researches on the Ethers. F. Guthrie—On Amyl-ethyl-methyl-acetonamine. A. R. Catton—On Mitscherlich's Law of Isomorphism and on the so-called Cases of Dimorphism.

BRISTOL AND CLIFTON CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting of the above, held on Friday, 18th inst., to discuss the Pharmacy Bill, the following resolution was unanimously carried :—

"That the thanks of this Association be forwarded to the President of the Pharmaceutical Society and those gentlemen who have laboured with him, for their exertions in the cause of Pharmaceutical education in connection with the Pharmacy Act of 1868.

THE PHARMACY ACT AND HOMŒOPATHIC CHEMISTS.

At a meeting of homœopathic chemists and medical men, held to consider the provisions of the new Pharmacy Act, the chairman, in commenting on the 17th clause as affecting homœopathic medicines, said he thought the best way of dealing with the difficulty was by fixing a definite quantity, such as the hundredth part of a grain of arsenic or corrosive sublimate, or the hundredth part of a drop of aconite, which it should be lawful to sell at one time. Another point considered was "the provision which rendered it necessary for dispensers of medicines to make up prescriptions according to the directions of the British Pharmacopœia."* A deputation to the Home Secretary on the subject was proposed, but it was ultimately decided to appoint a committee of homœopathic doctors and chemists to watch the Pharmacy Act, and take such steps as might be necessary to preserve the rights of homœopathic chemists."

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* The words of the Act are, "who shall compound any medicines *of the British Pharmacopœia* except according to the formularies of the said Pharmacopœia."

BISULPHIDE OF CARBON A REMEDY FOR HEADACHE.

Dr. Kennion, of Harrogate, in the 'British Medical Journal,' June 13, thus describes the mode of application of this remedy:—"A small quantity of the solution (about two drachms) is poured upon cotton-wool, with which a small wide-mouthed glass-stoppered bottle is half-filled. This, of course, absorbs the fluid; and, when the remedy has to be used, the mouth of the bottle is to be applied closely (so that none of the volatile vapour may escape) to the temple, or behind the ear, or as near as possible to the seat of pain; and so held for from three to five minutes. After it has been applied for a minute or two, a sensation is felt as if several leeches were biting the part; and, after the lapse of two, three, or four minutes more, the smarting and pain become rather severe, but subside almost immediately after the removal of the bottle. The effect of this application is generally immediate."

BOOKS RECEIVED.

Pharmacopœia of India. Edited by E. J. Waring, M.D., etc., assisted by a Committee, appointed for the purpose. From the Pharmacopœia of India Committee.

A Treatise on Physiology and Hygiene: for Schools, Families, and Colleges. By J. C. Dalton, M.D., etc. With illustrations. London: Sampson Low and Marston. 8vo. Pp. 399. 1868.

The Poison Book, as required by the "Sale of Poisons and Pharmacy Act Amendment:" containing a list of poisons (and their preparations) required by the Pharmacy Act to be registered previous to Sale. Birmingham: White and Pike. London: to be had of all Wholesale Drug Houses. 1868.

Pharmaceutical Chemists' Sale of Poisons Register Book: in conformity with the "Sale of Poisons and Pharmacy Act Amendment." London: H. Silverlock, 17, Earl Street, Doctors' Commons. 1868.

The New Pharmacy Act Sale of Poisons Book, for Registering all Poisons sold, in accordance with 31 & 32 Vict. c. 121. 1868. London: Printed and Published by J. Davis, 201, Old Kent Road, S.E.

The arrangement adopted in this Poison Book is very clear, the particulars of each sale appearing on one line. Besides a copy of the Pharmacy Act, will be found some tables and other useful information.

TO CORRESPONDENTS.

Persons having seceded from the Society may be restored to their former status on payment of arrears of subscription and the registration fee of the current year.

Those who were Associates before the 1st of July, 1842, are privileged (as Founders of the Society) to become Members, and by virtue of membership to be registered as *Pharmaceutical Chemists*.

Adulteration of Annatto.—Mr. W. Robertson (Elgin) makes the following statement:—"I find that my annatto agrees in every respect with the sample reported upon by Mr. Laird at the Norwich Pharmaceutical Conference, with this exception, however, that instead of 15 it contains 30 per cent. of spirituous extractive colouring matter, resembling the ordinary Tinctura Croci when diluted with an equal volume of spirit. The quantity I operated upon was 100 grains, with 4 oz. rectified spirits. I have been told that in Ireland haysaffron is used in the dairy instead of annatto."

Preserved Lime and Lemon Juice.—We have received a communication from Messrs. Rose and Co., of Leith, on this subject. The preserving agent is stated to be sulphurous acid or its sulphites (bisulphite of lime being preferred), mixed in the proportion of 1 to 2 per cent. with the juice, which effectually overcomes any tendency to mould or ferment. This process, we understand, is protected by patent. We hope it is so completely protected as to prevent the use of the preserved lemon-juice in pharmacy.

The New Pharmacy Act.—A correspondent ("*Wholesale*") makes the following objection to the 4th clause:—"Reading literally the clause with reference to Assistants, those in the wholesale are excluded, and yet it cannot be that they are less efficient because to their retail they have added three years' wholesale experience. Many of them have fondly thought that by going into the wholesale for a while, the increased opportunities they would have of examining and comparing the different qualities of drugs, with opportunities also of seeing many which, being seldom used, are not often kept in stock by the retailer, would render them better capable of conducting a retail establishment; but if this clause is read literally their efforts are thwarted. The clause is indeed an absurdity, and in effect limits the business to 'dispensing the prescriptions of duly qualified medical men.' Were this all required, it might be sufficient for the dispenser simply to dispense the prescriptions brought him; but then is he not supposed to be thoroughly acquainted with the articles dispensed? If so, surely a man who traces the progress of serons of bark from their importation, through the examining, comparing, sorting, and grinding, knows more of the real value and purity of the article, than he who passes a few grains through his hand now and again. But absurd as the clause is, the absurdity does not lessen the wrong done to the wholesale assistants; and, assuming that it is to be read literally, will you kindly insert this letter in the next Journal as a call on them to meet and see if something cannot be done towards amending the clause?"

The Lecture Hour.—Sir,—I beg to suggest that the lecture hour be altered from half-past eight to nine o'clock, which would be quite as suitable for the assistant and more convenient for the master. When these lectures were first started, it mattered little to the great majority of assistants. They had then only a limited attendance, principally residents within gunshot of the institution. Now that the Legislature has brushed up the energies and developed a desire amongst our juniors to arrive at a more scientific attainment, it is the duty of those who have the regulation of these matters to foster the feeling, and clear the way of all impediments. I have always given my assistants the option of attending, but have hitherto had some difficulty in persuading them to do so; but now, from practical experience, I find it a *sine quâ non* on their part, so that a large increase may be expected this session. It must be borne in mind that he is expected to put the shop in working order, besides getting his breakfast, before he starts; the former of these operations is only a matter of assiduity with him, but the latter concerns the household. Few of our craft, I guess, breakfast before eight,—in fact, this may be considered the regulation hour, and allows those only residing within a one-mile radius of the lecture room to be there by half-past eight. Of course, it is not possible to fix a time to suit the whole of the metropolitan druggists; if, however, the time were to be altered to nine o'clock, it would give to those within a three-mile radius an opportunity of attending with convenience to all concerned.—I am, Sir, yours obediently,

Sept. 12th, 1868. A Founder.

A. T. (Meath).—The necessary information may be obtained by application by letter to the Secretary, 17, Bloomsbury Square.

"*Dispenser*" (Brighton),—*Poison Bottles*,—thinks that, as in the label "not to be taken," the word "*not*" is sometimes obliterated, it is better to use a label "*For External application only.*"

"*A Druggist.*"—The statement that "Betts's Patent" expired in January last is, we believe, perfectly correct.

A. B. C. wishes for a formula for "Liq. Copaib. c. Cubeb. et Buchu."

R. T. R. (Burnley).—Of the labels sent for inspection, that for "Orange Quinine Wine" is liable to the Patent Medicine Stamp; the other would not be liable, provided no further directions are given with the "Solution."

H. S. G. (Bradford), in answer to "M. D." (Tuam), states that *Chlorodyne*, known as "Dr. Ogden's," contains Indian Hemp. The formula for this preparation we have given before, it will be found in Vol. III. (N. S.), page 584.

A. C. (Uckfield).—See page 115 of our last number.

M. L. C. C. (Liverpool) should write to the Secretary, with name and address, who, no doubt, would admit to the Modified Examination.

"*An Assistant*" (New Kent Road).—See article in our last number on "The New Pharmacy Act."

"*Ferrodyne*" (Halesworth).—(1.) We believe the dose to be perfectly correct in both cases. The quantity of acid in the latter accounts for the apparent discrepancy.

(2.) No; an excess is necessary. (3.) About 2 grains in the drachm. (4.) The dose we presume, would be about the same as that of Phosphate of Iron.

W. L. G. (St. Austell).—See page 112 of the August number.

"*Subscriber*" (Glasgow).—*Syrup. Ferri et Quinæ Iodid.*

Iodine, 1 oz. av.
Iron Filings, ½ oz. av.
Aquæ Dest. 2 fl. oz.
Quiniæ Disulph. ℥ 20 gr.
Acid. Sulph. Dil. q. s.
Aquæ Dest. 3 oz.

Mix the solutions, collect precipitate, press strongly, and dissolve in 15 fl. oz. Syr. Simp. Produce 16 fl. oz.

"*A Member.*"—(1, 2, and 3.) Yes. (4.) Articles mentioned in Part 2 of Schedule A require only to be labelled, and to have the word "Poison," and the name and address of seller, affixed. All prescriptions containing either of the articles mentioned in Part 1 to be copied in a book kept for that purpose. Either of the said articles, when not forming part of a prescription of a legally-qualified medical man, cannot be sold without registration according to the Act. Persons registered as chemists and druggists will be eligible for election as Members without examination.

J. L. (Swansea) wishes to know the properties of "Marion's Transparent Pellicle."

"*Oxford.*"—See last number of the Journal, where the answer will be found.

"*An Assistant*" (Norwich).—An analytical estimate of the quality and purity of articles submitted to the candidates in the "Modified Examination" is, we believe, not expected.

"*Chemicus.*"—We should think that carbonate of soda would answer as well as soda-ash in the case mentioned.

"*A Subscriber*" (Dublin).—See p. 234.

"*An Old Member*" (Chertsey).—The answer will be found in clause 16, p. 124 of our last number.

C. L. J. (Bury St. Edmund's) is referred to the last number of the Journal.

F. W. J. (London) is not entitled to pass the Modified Examination.

W. L. (Dorking).—We find the mixture a little cloudy, but without the copious deposit noticed by our correspondent. It is not compulsory to pass the Minor Examination before the end of the year.

A. R. C. is referred to the September number of the Journal.

W. J.—*Beasley's Pocket Formulary.*

G. B. (York).—The precipitate is probably an oxyphosphate of iron: exclusion of air and excess of acid may prevent its formation.

"*An Unqualified Assistant.*"—Yes.

D. G.—Possibly of the seed merchants:—Gibbs, Piccadilly, or Carter, Holborn.

H. H.—(1.) The publication of the work is uncertain. (2.) Sibson's 'Agricultural Chemistry' (Routledge), or Church's 'Manual' (Van Voorst).

M. P. S. (Leicester).—Yes; see September number of the Journal,

R. P. (Cardiff).—See September number of the Journal.

"*Inquirer*" (Brentwood).—Bisulphide of carbon is now being used as a stimulant in the cases referred to. Its general properties will be found in any work on chemistry.

"*Pharmicus*" (Mansfield).—Not in its natural state.

"*Anxious Inquirer*" (Harleston) should make application to the Registrar. See *Clause* 4 of the Pharmacy Act.

W. H. B. (Dublin).—Vol. VIII. (N. S.), p. 196.

Communications are acknowledged from Mr. Mumbray; Mr. Claypole; "A Dublin Chemist;" Mr. J. B. Smith; "The Maker;" "A Major Associate;" and "Another Assistant."

Instructions from Members and Associates respecting the transmission of the Journal before the 25th of the month, to ELIAS BREMRIDGE, Secretary, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Messrs. CHURCHILL, New Burlington Street. Other communications to the Editors, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. X.—No. V.—NOVEMBER, 1868.

LEGISLATION RESPECTING CHEMISTS AND DRUGGISTS.

The time is rapidly approaching at which the Pharmaey Aet of 1868 will become operative law. Two months henee it will be unlawful for any unregistered person to call himself a Chemist and Druggist, or, so far as selling or compounding the poisons enumerated in Schedule A of the Act are eoncerned, exereise the business of one. That this is a question to which other eyes than those of Pharmaceutists have been directed may be gathered from a police case reported in the 'Times' a fortnight ago, on hearing which Mr. Flowers took occasion to observe that by a recent Act it was made an offence to sell any poison without duly labelling it, or to sell certain more deadly poisons without registration of the sale, and a knowledge of the purchaser; he further remarked, that had the seller of the poison, used on that oeeasion, been charged before him under the new statute, he, Mr. Flowers, would have had no option but to inflict a penalty of five pounds for a first offence, or ten for a second, and that he hoped his *warning would go forth to the public, that the provisions of this most salutary enactment might become known.* Seeing, therefore, that magistrates are prepared at once to carry out the law, we feel bound again and again to remind our readers of the time at which registration will be compulsory, and of the fact that unless that registration be applied for, on or before the last day of December, by chemists already in business, they will on a later registration be required to pay the same fee as those who may hereafter come up for examination, namely, five pounds. However much the Pharmaceutical Society might be benefited by delay, we are quite sure, their objects being the safety of the public, the advancement of Pharmacy, and the improvement of the trade, that their great desire is to draw the attention of all Chemists and Druggists to the time at which free registration will eease for men in business; and the opportunity for assistants who may desire to reserve to themselves the right of commencing business on their own account, after passing only a *modified examination*, be lost altogether. The synopsis of that examination has now been before them for two months, and we have heard no complaint concerning it. As a matter affeeting future status we might be inelined rather to advise our younger readers to adopt the more decided step at once, and by a little application to prepare themselves for the "*Minor*" instead of the "Modified," feeling that a great proportion of them would then be induced ultimately to ascend yet higher and join the rank of Pharmaeeutical Chemists. Some men have expressed an opinion, that hereafter Chemists and Druggists, having all the trading privileges belonging to their calling, will be in a majority over Pharmaceutical Chemists. We cannot share this expectation. When a trade becomes a profession, or even takes to itself a professional or scientific character, titles of honour become important, not simply in the eyes of its members but also in the estimation of the public

It happens that the trade of a chemist is one actually requiring scientific know ledge, and will require it more and more as the discoveries and investigations of those already engaged init proceed; therefore the trade does, on its higher and brighter side, border on a profession.

Some of the provisions of the new Act may seem to involve an amount of precaution difficult to exercise. As to labelling even, although we believe no careful chemist would suffer laudanum to leave his shop without its name and the word "Poison" being affixed to the bottle containing it, we can quite see the depreciation which that same word must suffer if it be applied indiscriminately to *all preparations of poppies*. It is on such a point as this that we may hope for relief by an honest and hearty working together of the Privy Council and the Council of the Pharmaceutical Society; but this unity of action cannot be effected unless all those for whose regulation, and partly for whose benefit, the Act was passed, assist by obeying its provisions. It should be determined, as far as possible, what are in the eye of law the "*preparations*" of the forbidden poisons. Some chemists have inquired whether paregoric lozenges and syrup of red poppies are to be labelled "Poison," and we confess to a sympathy in their doubt. We believe, however, such difficulties will vanish in practice.

A somewhat peculiar difficulty arises in Scotland. When the Bill came from the House of Lords to the Commons all duly "*qualified medical practitioners*" were exempted from the action of the first fifteen clauses; but by the substitution of the word "Apothecary" for "Medical Practitioner" in the lower House, it becomes questionable whether in North Britain, where apothecaries are unknown, the surgeons can continue to compound their own medicines, if any *poison* be contained therein. Such a prohibition was never contemplated by the framers of the Bill, and we do not wonder at the alarm expressed on the subject beyond the Tweed. It would even, in some cases, act detrimentally in England now that many general practitioners take their qualification from the Colleges and not from the Hall.

THE SANDFORD TESTIMONIAL.

A report will be found in another part of this Journal of the proceedings which have been instituted for giving effect to a very generally expressed desire among Chemists and Druggists throughout the country that the services rendered by Mr. Sandford, President of the Pharmaceutical Society, in promoting the passing of the "Pharmacy Act, 1868," should receive some signal recognition, which should indicate how highly those services are appreciated, and how important the benefits resulting from their successful application are considered to be. It is not too much to say that the passing of the Amended Pharmacy Act has been mainly effected through the persistent energy, the well-balanced judgment, the courteous bearing, the cool determination, and perfect good faith which, throughout a lengthened struggle, and under many trying circumstances, have been manifested by the able leader to whom the Council of the Pharmaceutical Society have for five successive years entrusted the chief management of the important undertaking they entered upon in endeavouring to place the practice of pharmacy upon a better, safer, and sounder basis. Those who for so many years have looked to the object which has now been attained as the great desideratum, without which all their efforts or desires for the advancement of pharmacy were felt to be of small avail,—who have looked and longed, but have sometimes become faint-hearted, and ready to turn from the task of accomplishing what some even of the most experienced among them have thought to be hopeless, and all have seen to be surrounded with difficulties, —can but acknowledge the claims to special recognition of the man who, beyond

all others, remained steadfast, unshaken in faith, and indomitable in firm determination to go on and conquer, remaining instant in action until the attainment of the desired end. We feel that it is unnecessary here to do more than to call the attention of those who are about to benefit from what has thus been done in their behalf to the opportunity afforded them of signifying their appreciation of the means through which so important and influential a work has been accomplished.

TRANSACTIONS

OF

THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *October 7th*, 1868,

Present—Messrs. Abraham, Bottle, Bourdas, Brady, Carteighe, Deane, Edwards, Evans, Haselden, Hills, Mackay, Morson, Orridge, Sandford, Savage, Squire, Standring, Stoddart, and Williams.

The following were elected

MEMBERS.

Sleggs, George Richardson ..... Liverpool.
Wastie, Francis .. ..London.

The following, having paid their arrears and their subscriptions for the current year, were restored to Membership :—

Glynn, William .....Torquay.
King, Robert .....Twickenham.

ADJOURNED MEETING OF THE COUNCIL, *October 8th*, 1868.

Present—Messrs. Abraham, Bottle, Bourdas, Carteighe, Haselden, Hills, Morson, Orridge, Sandford, Squire, Standring, and Williams.

Certain alterations in the Bye-laws were considered and approved.

SPECIAL MEETING OF THE COUNCIL, *October 13th*, 1868.

Present—Messrs. Bottle, Bourdas, Carteighe, Deane, Haselden, Hills, Morson, Sandford, and Williams.

Certain alterations in the Bye-laws were considered and approved.

SPECIAL MEETING OF THE COUNCIL, *October 14th*, 1868.

Present—Messrs. Bottle, Bourdas, Evans, Hills, Orridge, Savage, Standring, and Williams.

Approved and confirmed the Bye-laws, and submitted them to the Special General Meeting of the Members of the Society, convened for one o'clock this day, for the purpose of abrogating or altering all or some or one of the Bye-laws of the said Society, and of considering and, if thought proper, of confirming and approving such new or additional Bye-laws or several Bye-laws as the Council of the said Society shall deem proper and necessary, and submitted to the said Meeting, for the purposes contemplated by the Charter of Incorporation of the said Society, and by a Statute made and passed in the 15th and 16th years of the reign of her present Majesty, intituled "An Act for Regulating the Qualifications of Pharmaceutical Chemists," and also by a Statute made and passed in the 31st and 32nd years of the reign of her present Majesty, intituled "An Act to Regulate the Sale of Poisons and Alter and Amend the Pharmacy Act, 1852," or for any or either of such purposes.

Mr. George Webb Sandford, *President, in the Chair.*

The report of the Special General Meeting will be found at page 277 of this Journal.

BOARD OF EXAMINERS, *October* 21*st*, 1868.

Present—Messrs. Bird, Carteighe, Cracknell, Darby, Deane, Edwards, Evans, Gale, Garle, Hanbury, and Haselden.

Twenty Candidates presented themselves for Examination; the following eleven passed, and were duly registered:—

MAJOR (as Pharmaceutical Chemists).

Hill, Henry.....Kendal.
Palmer, Alfred Neobard.....Bury St. Edmund's.

MINOR (as Chemists and Druggists).

Beesley, Thomas .....Birmingham.
*Candy, William Gilbert .....Bath.
Cope, John Ambrose.....Sydenham.
*Griffiths, Waldron.....Harrow-on-the-Hill.
Havard, Benjamin.....Cardigan.
Monkhouse, Joshua .....Gainsborough.
Perkins, Thomas James.....Norwich.
Reade, Oswald A. .....Chester.
Southwell, Charles Henry.....Boston.

REGISTERED APPRENTICES AND STUDENTS.

Name.	Address.	
Allen, Benjamin	Messrs. Banks and Son	Birmingham.
Ashley, Henry	Mr. Beaumont	Gravesend.
Baskerville, John	Messrs. Hodgson and Son	Stockton.
Bliss, William Thomas	Messrs. Banks and Son	Birmingham.
Brown, James	Mr. Hogg	Bideford.
Churchill, Henry	Mr. Timothy	Reading.
Clarke, Josiah	Mr. Munday	Worthing.
Collins, James	Messrs. Harvey and Reynolds	Leeds.
Cooper, William J.	Messrs. Bowerbank	Cockermouth.
Dampney, Richard Shephard	Mr. Churchouse	Chard.
Druce, George Claridge	Messrs. Jeyes and Co	Northampton.
Ewing, James Laidlaw	Mr. Ewing	Dumfries.
Gimson, Joseph	Mr. Buzzard	Leicester.
Gittings, Alfred	Mr. Nicklin	Tipton.
Griffin, Alfred William	Messrs. White and Chignell	Havant.
Grimwood, Harry Charles	Mr. Woods	Plymouth.
Grinstead, John	Mr. Long	Chichester.
Groves, Arthur William		London.
Haworth, Benjamin	Mr. Botham	Manchester.
Histed, Edward	Mr. Wibmer	Tunbridge.
Holley, George Herbert	Mr. Thompson	Southgate.
Iredale, George	Mr. Iredale	Leeds.
Jackson, Wm. Singleton	Mr. Jackson	Liverpool.
James, William	Mr. Shipman	Northampton.
Jasper, Frederick William	Mr. Hemmings	Penzance.
Kirby, Frederick	Mr. Steward	Bridgnorth.
Kirton, Argent Blundell	Mr. Kirton	Southsea.
Langford, William Stockdale	Mr. Langford	Wisbeach.
Lee, Frederick Augustus	Mr. Lee	Great Yarmouth.
Lyon, James	Mr. Matthews	Ipswich.
Mackay, Edward	Mr. Kendall	Masham.

* Passed in honours; eligible, at the end of the Session, to compete for the Prize of Books.

Mellor, John Gilbert	Mr. Kershaw	Southport.
Owen, Rowland	Messrs. Hughes and Son	Holyhead.
Parrott, William Searle	Mr. Spargo	Falmouth.
Paulin, John	Mr. Carran	Peel, I. M.
Peters, David	Mr. Davies	Llandilo.
Prettijohn, Robert Froude	Mr. Whiteway	Torquay.
Randall, Frederick Joseph	Mr. Shenstone	Colchester.
Sant, George	Messrs. Parkes and Son	Atherstone.
Shenstone, William Ashwell	Mr. Shenstone	Colchester.
Skinner, Kenneth G	Mr. Judd	Christchurch.
Smith, Joseph Wheeler	Mr. Smith	Birmingham.
Torbitt, Charles	Mr. Sanderson	Birmingham.
Vaughan, John	Mr. Morgan	Market Drayton.
Verity, Edwin	Messrs. Harvey and Reynolds	Leeds.
Wallis, Herbert Boyd	Mr. Mason	London.
Webber, Robert	Mr. Mortimer	Sidmouth.
While, William John	Mr. Preece	Cheltenham.
Wiseman, Ebenezer Henry	Mr. Linay	Cambridge.
Wyley, William	Messrs. Wyley and Brown	Coventry.

BOARD OF EXAMINERS, *October 28th*, 1868.

Present—Messrs. Bird, Carteighe, Darby, Deane, Evans, Gale, Garle, Hanbury, and Haselden.

Nineteen candidates presented themselves for Examination; the following eight passed, and were duly registered :—

MAJOR (as Pharmaceutical Chemists).

Blake, Charles	Sutton-in-Ashfield.
Botham, James	Manchester.
Cromwell, Oliver	London.
Jones, Llewelyn Lloyd	Buenos Ayres.
Judson, William	High Wycombe.
Manning, Thomas Davys, jun.	Yeovil.
Speechly, George	Bishop Stortford.
Tasker, William	London.

BENEVOLENT FUND.

ELECTION OF ANNUITANTS.

A meeting was held at the House of the Society, on Friday, the 16th of October, pursuant to notice, for the Election of Two Annuitants on this Fund, each to receive Thirty pounds per annum; Mr. Sandford, President, in the chair.

Six applicants had been placed by the Council on the list of Candidates approved for Election, and their cases described in the October number of the Transactions, page 190.

The following scrutineers were appointed, from the voters present:—Messrs. I. Bourdas, H. Sugden Evans, John Moss, Charles E. Turner, and John Williams.

The votes having been examined, the scrutineers reported the following result:—James Wick, 1719. Richard Trumper (316 brought forward), 899. Martha Jane Farrow (361 brought forward), 766. John Watkins, 337. Hannah Greaves, 315. Charles Thomas Anderson, 135. Informal Votes, 60.

The Chairman declared James Wick and Richard Trumper duly elected.

Thanks were given to the Scrutineers and to the Chairman.

The votes polled for unsuccessful candidates may be carried forward for four successive elections.

Subscriptions and Donations received during October.

SUBSCRIPTIONS.

London.

	£	s.	d.
Bird, A., Shepherd's Bush	2	2	0
Brown, H. F., 40, Aldersgate Street	0	10	6
Cooper, Albert, Kensington	0	10	6
Elvey, T., Halkin Street, W.	1	1	0
Gadd, Henry, Kingsland	1	1	0
Kershaw, G., Camden Town	1	1	0
Lees, James, Upper Street, N.	0	10	6
Ramsey, J. W., Endsleigh St. W.C.	0	10	6
Sainsbury, S., 177, Strand	1	1	0
Thomas, Henry, Upper St. Martin's Lane	0	10	6
Treloar, T., Ludgate Hill	0	10	6
Whitaker, John, London St. W.	1	1	0

Country.

	£	s.	d.
Airdrie, Harvie, John	0	10	6
Amble, Tweddell, James	0	5	0
Bedale, Fowler, E.	0	10	6
Birmingham, Mantell, Charles	0	10	6
Bristol, Margetson, James	0	10	6
„ Thomas, J. D.	0	10	6
Brynmawr, Jones, Alfred M.	0	5	0
Cerrig-y-druidion, Williams, E.	0	10	6
Chester, Jones, Robert	1	1	0
Chorley, Moss, John	0	5	0
Cirencester, Smith, Charles S.	1	1	0
Crowland, Wilson, Gaudern	0	10	0
Forest Hill, Simpson, Thomas	0	5	0
Gainsboro', Collitt, Eliza	0	5	0
Glasgow, Currie, John	0	5	0
Goole, Hasselby, Thomas J.	0	5	0
Godalming, Christian, George	0	2	6
„ Forster, W. D.	0	2	6
Grimsby, Cook, Robert	0	10	0
Harrogate, Greenwood, John'.	0	10	6
Hartlepool, West, Cooper, S. H.	0	2	6
„ Emerson, C.	0	10	0
Hexham, Bell, George	1	1	0
Howden, Selley, William	0	10	6
Hull, Hudson, J., Esq. (per Mr. Baynes)	2	2	0
Leamington, Woolcott, Charles	0	10	6
Liverpool, Tanner, Alfred E.	0	10	6
Ludlow, Smith, A. J.	0	10	6
Macduff, Henry, Andrew	0	5	0
Manchester, M'Minn, James	0	10	0
„ Paine, Standen	0	10	6
„ Ritson, John	0	5	0
„ Williams, Martha.	0	5	0
Margate, Wootton and Son	0	10	6
Middleton, Livsey, J. W.	0	2	6
Minehead, Bond, John	0	5	0
Newport, Salop, Picken, T. W.	0	10	6
North Walsham, Bailey, G. W.	0	5	0
Norwich, Bliss, Joseph James	1	0	0
Richmond, S. W., Hopwood & Son	1	1	0
Rochdale, Booth, James	1	1	0
Sandwich, Harris, Henry	0	10	6
Selby, Cutting, Thomas J.	0	5	0
Shields, North, Hunter, Thos.	0	5	0
Sutton, Macclesfield, Dale, Saml.	0	10	6
Tadcaster, Scholefield, W.	0	5	0
Thornton, near Bradford, Waddington, Benjamin	0	5	0
Wolverhampton, Turner, W.	0	2	6
Woodbridge, Betts, John	0	10	0
York Town, Frimley, Wickes, C.	0	10	6

DONATIONS.

Country.

	£	s.	d.
Hadleigh, Hardacre, Henry	0	10	6
Manchester, Pyne, Joseph J.	3	3	0
Newport Pagnell, Taylor, T. and F. J.	5	5	0
Semer, near Ipswich, Enser, J. L.	3	13	6

London.

Evans, H. Sugden, 60, Bartholomew Close	1	1	0

PHARMACEUTICAL MEETING.

Wednesday, October 7th, 1868.

MR. G. W. SANDFORD, PRESIDENT, IN THE CHAIR.

The Minutes of the previous Meeting having been read, the following

DONATIONS TO THE LIBRARY AND MUSEUM

were announced, and the thanks of the Meeting given to the respective donors thereof:—

Calendar of the Royal College of Surgeons of England, 1868; Historical Sketch and Laws of the Royal College of Physicians of Edinburgh; Sketch of the Early History of the Medical Profession in Edinburgh, and Historical Sketch of the Royal College of Surgeons of Edinburgh: from the respective Colleges,—Glasgow University Calendar: from the University,—Catalogue of Scientific Papers, vol. i.: from the Royal Society,—Statistical Tables of Patients during 1867: from St. Bartholomew's Hospital,—St. Thomas's Hospital Museum Catalogue, 3 vols. Pharmacopœia, Statistical Report, and Calendar: from St. Thomas's Hospital,—Index to Native and Scientific Names of Indian and other Eastern Economic Plants and Products: from Dr. J. Forbes Watson, India Museum,—Pharmacopœia of India: from the Pharmacopœia Committee,—Transactions of the Clinical Society of London, vol. i.: from the Society,—Quekett's Lectures on Histology: from Mr. Joseph Ince,—Report on Epidemic Cholera and Yellow Fever: from the Surgeon-General, U.S. Army,—The Indigenous Drugs of India: from Kanny Loll Dey,—Sur le Silphium (Assafœtida): from Mons. Déniau,—De l'Introduction et de l'Acclimatation des Cinchonas dans les Indes Néerlandaises et dans les Indes Britanniques; Produits Végétaux du Portugal: from MM. J. L. Soubeiran and A. Delondre,—Rapport sur la Culture de Cépages de Tokay, en France: from M. J. L. Soubeiran,—An Attempt to answer the question, Which part of the Plant Conium Maculatum is the best for Medicinal Use?: from Mr. W. Manlius Smith,—Fourth Annual Report of the Alumni Association of the Philadelphia College of Pharmacy, containing also the Valedictory Address by Professor Parrish: from Professor Parrish,—Tabular View of British Fossils, Stratigraphically Arranged: from Mr. E. J. Owles,—Clinical Chart of Temperature, etc.: from Messrs. Harvey and Reynolds,—a Specimen of Brain Coral, and also Preserved Specimens of the Fruit of the Nutmeg Plant, from Cawnpore: presented by Mr. R. Harman,—Specimens of Indian Salep from the Neilgherries: presented by Mr. J. E. Stuart,—A Specimen of Bay Rum distilled from Bay Leaves in the Isle of St. Thomas, and used for toilet purposes: presented by Mr. M. E. Foster,—A Specimen of Lign Aloe Wood from West Coast of Mexico, and the "Otto of Lign Aloes" distilled therefrom: presented by Messrs. Piesse and Lubin,—A Model of an Apparatus for Continuous Filtration (described in the Pharmaceutical Journal, Vol. X. p. 216): presented by Mr. A. Freire-Marreco,—Specimen of Ore from Isle of Man, containing Lead, Copper, and Blende: presented by Mr. E. L. Crow.

During the evening Messrs. HORNE and THORNTHWAITE, and Mr. JAMES HOW, of Foster Lane, very kindly exhibited several microscopes, and various other objects of scientific interest.

Jarvis's Poison Shield was laid on the table for inspection.

Burrow's Patent Soda-water Racks.—Specimens of these racks for the storage of mineral waters, sent by the patentees, were placed for inspection of the members. The obvious advantages of these racks appear to be economy of space and safety.

The CHAIRMAN, in opening the proceedings, said he had on some occasions been unavoidably absent from the first meeting of the session, but it was not any want of sympathy with the object of these gatherings which had caused his absence, for he thought they were most important, and tended greatly to

the good of the Society. The Pharmaceutical Conference met once a year, and a most pleasant meeting they had lately had; he did not see why the Pharmaceutical Society should not have a good conference once a month for the mutual interchange of experience and information. The presence of ladies was a new feature in their meetings, and he thought he should not be carrying out the wishes of the gentlemen present if he did not say a word of welcome to them; this was the first time it had been the privilege of any President to give such a welcome in that hall. He feared there would not be much to amuse their fair visitors, but it was always pleasant to see successful competitors receive their prizes. As the classes of students were now commencing their work, Mr. Brady had kindly undertaken to deliver an inaugural address. He would probably say something of the importance of pharmacy, but the President hoped he would not draw so glowing a picture as to tempt ladies into the profession. He would not detain the meeting longer, but would at once call on the Vice-President, Mr. Evans, to present the report of the Board of Examiners.

Mr. Evans said the official report had been presented to and approved by the Council, and was rather too dry to read in detail, but he would state generally the result of the examinations. During the past session 58 gentlemen had entered for the Major examination, of whom 48 had passed, 23 in honours, 9 being rejected, and 1 retiring. For the Minor examination 87 entered, 67 passed (9 in honours), 16 were rejected, and 4 retired. For the first classical examination 33 entered, and all but one passed. These results were highly satisfactory, and the large number who had passed the Major examination in honours showed that gentlemen now thoroughly appreciated the advantages of these examinations and well prepared themselves for them. All those who so passed were eligible to compete for the highest honour in the power of the Society to bestow, the Pereira medal, but he was sorry to say, that out of the 23 only 6 competed; if a larger number had entered the lists he felt sure they would have done honour not only to themselves but also to the cause of pharmacy. There were now 1036 gentlemen who had passed the Major examination, and 1177 who had received the certificate of having passed the Minor examination, so that there remained a balance of only 141 of those who had passed the first who had not presented themselves for the higher test, and he had no doubt that many of these were now preparing themselves for so doing. A slight modification had been made in the examinations with regard to botany, which was generally found by students a very difficult subject, and it had now been decided that it should not be estimated equally with the other subjects in which the students were examined, and it would not in future tell so heavily upon the result. He would, however, remind students of one curious fact, which they would do well to bear in mind, that those candidates who had come up weak in their botany, had been found correspondingly weak in that most important subject, *materia medica*. This he accounted for in this way, that botany being a difficult and dry subject at the commencement, was of great service in disciplining the mind and enabling it afterwards to grasp and retain facts which it would otherwise have found it more difficult to grapple with. The papers sent in by the six aspirants for the Pereira Medal were all of a very high character, but those of the gentleman writing under the motto *Singulariter in spe* being far in advance of any of his competitors, the medal was awarded to him, and the Council had acceded to the recommendation of the Board of Examiners that on this and future occasions the medal should be struck in silver instead of bronze as heretofore. For the junior prize of books, five presented themselves, the prize being awarded to Mr. Matthew Henry Stiles. Two candidates had presented themselves for the Senior Bell Scholarship, which had been awarded to Mr. John Moss, and there were six candidates for the Junior Scholarship, which had fallen to Mr. John Ingham.

CHEMISTRY AND PHARMACY.

Dr. Redwood said he had the honour of reporting the result of the examination in Chemistry and Pharmacy. He had now been, for more than twenty-five years, in the habit of thus annually presenting himself as one of the professors of the Society, and had therefore had an opportunity of tracing the progress which had been made in successive years by the students attending the Institution, and it was no small commendation of the proficiency of some of the students in the late session that he should be able to say, as he did most emphatically, that on no former occasion had the answers given by the successful competitors possessed a higher value than on the present occasion; he might even go further, and say that never before had the answers been of so high a value. On a retrospect of the experience of past years in reference to the results of the teaching afforded, it was gratifying to be able to say that there had been a gradual but certainly progressive improvement manifested by the students. For instance, in early years it was found necessary to be less exacting in the answers required and more indulgent to the students, but, as time progressed, they had become more stringent, and more searching questions were set for the students in each successive year; and, while this had been the case, the answers given had fully kept pace with the requirements of the questions. At the last examination a list of questions was prepared, calculated to elicit from the more advanced students the full amount of knowledge which they possessed upon a number of important points in chemistry and the allied branches of science, and the answers which were furnished were of an unusually excellent character. Putting the total value of complete answers to all the questions at one hundred, the least value he had been able to attach to either of the sets of answers furnished by the successful competitors was ninety, the highest being ninety-six. Upon his report, the Council decided upon awarding a medal to two gentlemen, the values of whose answers were very nearly the same,—one being ninety-six, and the other ninety-five, and to another competitor, whose answers were really not very far short in value, an honorary certificate had been awarded. In conclusion, he could only say that he felt it an honour to have had in his class three gentlemen who had manifested so pre-eminently the good use which they had made of the time they had spent in the Institution; and he had no doubt that their future career would fully justify the expectations which had been formed concerning them. The following were the questions and the names of the successful competitors :—

1. Explain the leading features of the metric system of weights and measures. Give the values of the gramme and kilogramme in grains, and of the metre in inches. State the relationship of the litre to the kilogramme.
2. A solid substance (*a*), which weighs 225 grains in air, when suspended in water weighs 195 grains, and suspended in a liquid (*x*) weighs 192 grains. What are the specific gravities of *a* and *x*?
3. Explain how solution of dextrine affects a ray of light. What is the meaning of the term "fluorescence"?
4. Describe the method of producing nitrous oxide, pointing out the precautions to be taken to ensure its freedom from impurity, and giving its composition and properties, and the reaction which occurs in its production.
5. Describe the Pharmacopœia processes for the preparation of *Calomel* and *White Precipitate*, referring at the same time to other processes for the production of these medicines, and pointing out differences in the nature of the products obtained by such processes.
6. Give the formulæ, according to the new notation, for *Water*, *Alcohol*, *Ether*, *Acetic Ether*, and *Glycerine*, and show the supposed relationship which these bodies bear to each other.
7. Describe the artificial production of *Urea*.
8. How is *Lactic Acid* produced, and what is its composition?

MEDALS ..... { John Moss. / Alfred Neobard Palmer.
CERTIFICATE OF HONOUR ...John Thomas Ward Wallis.

BOTANY AND MATERIA MEDICA.

PROFESSOR BENTLEY said that among the pleasurable duties which he had to perform during the year, none was more so to him than that of presenting, as on the present occasion, his report of the conduct of the students in the class of Botany and Materia Medica which he had the honour to conduct in that Institution. Dr. Redwood had anticipated many remarks which he should otherwise have made, for although he could not refer to so long a connection with the Society as that gentleman, he could speak from twenty years' experience, and might repeat what he had said on many previous occasions, that he knew of no class of students who were more to be commended for diligence, good conduct, and perseverance, than the students of their School of Pharmacy. He stated this, not as a compliment, but simply as an act of justice; and on the present occasion he was glad to have his own opinion fortified by that of those who were well qualified to judge quite independently of himself. He referred to the authorities of the Royal Botanic Society, at whose gardens in the Regent's Park the students of the Pharmaceutical Society were in the habit of attending. When it was first suggested that the students should attend the botanical lectures during the summer months, at the gardens, many feared that much injury would be done by them to the plants and in other ways, but what was the fact? for twenty years no complaint of any importance had been made to him, and he was now very glad to be able to read an extract from a minute of the Garden Committee, under date May 23rd, 1868, which had been sent to him, and which was as follows:—

"The Garden Committee, on the commencement of another lecture season, are pleased to hear from the Secretary a very favourable report on the gentlemanly conduct of the students of the Pharmaceutical Society, and the absence of any complaint during the twenty years the class has attended Professor Bentley's lectures in the gardens, and of any injury to the plants and flowers; and the committee consider the Society is much indebted to Professor Bentley for this favourable report from the Secretary."

He was very glad to see the innovation which had been made of inviting ladies to be present at their inaugural meeting, and felt sure that the students who went up to receive prizes would in consequence feel an additional pleasure in so doing. Having made these preliminary remarks as to the good conduct of the students which he always had had, and doubtless always would have, to make, Professor Bentley went on to give the result of the prize examination. The competition for prizes was, taken altogether, equal to any previous one; but as there seemed a little misunderstanding on one or two points, he would state what the rules of the examinations were. He had been sorry to see so few competitors for the prizes, but he believed the reason was that in this Institution, as in many others, young men associated with one another, became aware of each other's capabilities and attainments, and consequently felt, if Mr. A. was going in for a particular prize, it was no use for others to compete with him. This was a great mistake, and he hoped all students would bear in mind this fact, that it was not the prize itself, but the knowledge attained in striving for it, which was of most real value; and he also reminded them, what all did not seem aware of, that although only one could obtain the prize, the certificates of honour and of merit were open to all who proved themselves deserving of distinction. He hoped, therefore, that next session there would be ten or fifteen certificates of

honour or merit awarded. He was happy to say that, on his report, the Council had awarded honorary distinction to three gentlemen. He could not say too much with regard to the medallist, and he could scarcely say too much with regard to the gentleman second in order. The gentleman who obtained the medal would certainly be an honour to the Society; and he was glad to say that he was this year the Senior Bell Scholar, and had also gained the prize in chemistry. He referred to Mr. Moss, whose answers were equal to any he had ever had during his twenty years' experience. The gentleman second in order, Mr. James Deane, had also done himself great credit; and indeed in the *vivâ voce* examination he had been one mark ahead of Mr. Moss. The third, who received the certificate of merit, was Mr. Wallis, who also well deserved the honour.

The following were the questions for the written examination :—

1. Describe the structure, form, and size of Starch Granules; and mention the characters by which you would distinguish West Indian Arrowroot or Maranta Starch, from Sago-Meal and Potato-Starch.
2. Describe the structure of the bark of a Dicotyledonous stem.
3. Define the following :—Corm, bulb, tuber, rhizome, epiphyte, parasite, tubercule, prickle, spine, pinnate, palmate, and phyllode.
4. Distinguish between indeterminate, determinate, and mixed inflorescences. Define a raceme, panicle, spadix, corymb, capitulum, and cyme.
5. Enumerate the officinal plants of the Order *Rutaceæ*. Describe the physical and chemical characteristics of Cusparia bark, and the means by which it may be distinguished from the bark of *Strychnos Nux-vomica*.
6. Enumerate the officinal plants of the Order *Compositæ*. Describe the botanical characters of the flowers of *Anthemis nobilis*, and state how they may be distinguished from the flowers of *Matricaria Parthenium* and of *Matricaria Chamomilla*.
7. Enumerate the officinal plants of the Order *Lauraceæ*. Give the botanical and geographical sources of officinal Camphor; mention its characteristics and show how it may be distinguished from Sumatra and artificial Camphors.
8. Explain the mode by which Aloes is obtained in the greatest purity. Mention the plants from which the officinal kinds of Aloes are supposed to be obtained, and describe the distinctive characteristics of Socotrine, Barbadoes, Hepatic, and Cape Aloes.
9. Give the essential characters of the following Natural Orders :—Rutaceæ, Malvaceæ, Umbelliferæ, Solanaceæ, Scrophulariaceæ, and Liliaceæ.

VIVA VOCE EXAMINATION.

Besides the above questions, the following plants were submitted to the several competitors, who were required to name them, to state the Natural Orders to which they belonged, to mention their properties, and to describe any peculiarity which they might present worthy of notice :—

Aconitum paniculatum—Raphanus Raphanistrum—Althæa officinalis—Malva sylvestris—Ecbalium officinarum—Fœniculum vulgare—Æthusa Cynapium—Conium maculatum—Anthemis nobilis—Artemisia Absinthium—Carthamus tinctorius—Digitalis purpurea—Verbascum nigrum—Lathyrus latifolia—Atropa Belladonna—Nicotiana persica—Solanum nigrum—Datura Stramonium—Capsicum species—Solanum Dulcamara—Solanum Dulcamara, var. alba—Mentha viridis—Origanum vulgare—Marrubium vulgare—Lavandula vera—Ricinus communis—Funkia ovata.

The medal and certificates were awarded as follows :—

MEDAL.....John Moss.
CERTIFICATE OF HONOUR ...James Deane.
CERTIFICATE OF MERIT.....John Thomas Ward Wallis.

PRIZES FOR HERBARIA.

Professor Bentley was glad to say that on the present occasion there had been more competition than on some former ones, though not so much so as he should like to see; for, although botany was not a very favourite study, and was considered rather dry, if young men would take an interest in collecting plants, it would soon become a favourite occupation, and they would lose sight of any difficulty arising from the hard names connected with the subject. Three collections had been sent in, the first in order of merit being that of Mr. Washington Gimblett, an apprentice of Mr. Stoddart's, of Bristol. When it was remembered that these collections were the work of apprentices or pupils, who had to search for specimens during the early hours of the morning, before commencing the business of the day, every one must consider that a collection of 300 named plants, like that of Mr. Gimblett's, was eminently worthy of a prize. Mr. Martin Luther Clift had obtained a certificate of honour for his collection, and Mr. J. Butten a certificate of merit. Both these gentlemen well deserved the distinctions which had been awarded them.

The medal and certificates were awarded as follows:—

Bronze Medal.....Washington Gimblett.
Certificate of Honour...Martin Luther Clift.
Certificate of Merit.....Joseph Butten.

PRACTICAL CHEMISTRY.

Professor Attfield said that, like his colleagues, he could only speak in terms of the highest praise of the students he had had the pleasure of instructing during the past session. He could thus allude to them not, like the previous speakers, from experience gained during lecture, or in that valuable half-hour after lecture in which pupils and professor held intercommunication, but from constant association with them during the whole of each day of their term of study. He had held a practical prize examination at the close of the session, and the result had been most satisfactory; but, in addition, he had at the first part of the session conducted oral examinations of the whole class, and afterwards several times examined each pupil separately before going up for the Minor or Major examination. Indeed, the only means he had of ascertaining students' deficiencies of knowledge was by daily, nay hourly, questioning the men, for manipulative skill and amount of work got through in a given time were not always measures of the quality of the knowledge possessed by pupils working in a laboratory; examination as well as superintendence was therefore necessary, and was constantly practised. Moreover, as the manufacturing or analytical operations performed by students were in a large degree only means to an end, namely, the correct and rapid acquirement of chemical principles, frequent examination with the view of testing the character of each pupil's knowledge became indispensable. From constant association with, and examination of, the students, therefore, he (Professor Attfield) could speak with the utmost confidence of their character and attainments as a class and individually. He had never had a set of men possessing more intelligence or practising more perseverance; in short, the characteristic of the class, as a whole, throughout the last session was continuous energy. He might add that his talented assistant, Mr. Tilden, had remarked to him that he had been able to go through his duties much more easily than in any previous session. In conclusion, he need only add that the gentlemen to whom prizes had been awarded,—Mr. Arkinstall, Mr. Franklin, and Mr. Palmer,—were highly deserving of the honours bestowed upon them.

The questions and awards were as follows:—

1. The "solution" given to you may contain any of the ordinary metallic salts used in medicine; analyse it, and state the results.
2. The accompanying "powder" is also a mixture of common metallic salts; examine it, and report your conclusions.
3. You are furnished with what you may regard as a "vomit" suspected to contain one of the following poisons:—mercury, arsenic, antimony, lead, copper, oxalic acid, hydrocyanic acid; which is present?
4. A specimen of "urine" is placed before you; is it morbid or healthy?
5. Ascertain the amount of rectified spirit (B.P.) in the "tincture" given to you.

MEDAL..... William Arkinstall.
CERTIFICATES OF HONOUR... { Alfred Franklin. / Alfred Neobard Palmer.

The CHAIRMAN then proceeded to deliver the prizes and certificates to such of the successful competitors as were present.

Mr. LESCHER, the winner of the Pereira Medal, briefly alluded to the former connection of his father with the Council of the Society, and to the passing of the new Pharmacy Act, which had given the direct authority of the Privy Council to the Examining Board of the Society. In conclusion, he said he owed all his success to the early teaching he had received at the hands of Professor Bentley.

The CHAIRMAN, having distributed the remainder of the prizes, said he hoped those who had received them would not think that their duty was now ended. They had their reward for the work already done, but a much greater work was before them. Hereafter no one would be allowed to practise pharmacy until he had shown himself to be qualified; and the Pharmaceutical Society would in future occupy a very different position. He looked to those who had that evening received prizes to uphold its character, and to raise the status of chemists throughout the kingdom. However, after what had been said by Mr. Evans and the learned professors, it was needless for him to say more, especially as Mr. Brady, whom he would now call upon, had prepared an address to the pupils.

INTRODUCTORY ADDRESS.

BY HENRY B. BRADY, F.L.S., F.G.S.

Mr. BRADY then rose, and said:—Mr. Chairman,—You and Professor Bentley have dwelt on the innovation which we observe in the appearance of the room to-night, as I have also done myself with great pleasure, but the sense of pleasure has brought with it a sense of dread, lest I should be occupying a false position here. The short address that I have written was prepared purely as a students' address, and it contains little of general interest, or such matter as may commend itself to an audience otherwise composed. Possibly I am not too bold in the hope that the ladies who have done us the honour to be present this evening will place themselves for the moment in the position of students,—a position they will most certainly adorn,—and accept what I here say from the only point of view from which it can be of any possible value.

The duty which has been committed to me, by those who have charge of the interests of this Institution, is a very simple one: it is to say, on their behalf, a few earnest words of welcome, and perhaps of sympathy and monition, to those about to begin their curriculum of systematic instruction within these walls; to hold out the hand of friendly recognition to some of the students of past years, who take the opportunity of the first meeting of the session to be again amongst us, that they may live again for a moment their earlier

student-life in the memories that crowd round each familiar thing. And surely, if aught that could be said might bind the young men who now throw in their lot with us in fellowship with those who have preceded them, might induce them to emulate the successes of some of their forerunners, or with increased opportunities to strive towards yet higher things, your Council would need no other justification in adopting this formality of an introductory address.

But before I devote myself to that special duty with which I have been charged, I may be permitted to express, very briefly, a few thoughts that have arisen in my mind on the present aspect of pharmacy in its social and ethical relations,—considerations which can scarcely be out of place when we reflect that the events of the past few months form the basis, on which the position of the rising generation of pharmaceutists must rest. We may be pardoned if on re-assembling after so eventful a recess, mutual congratulation should take the place of our customary greetings. In this interval another great advance has been made towards enlightened legislation in respect to pharmacy,—the greatest step, possibly, since the first recognition by the State in 1841 of the claims of special education as set forth in our Charter of Incorporation. We are no longer, as we were stigmatized in the House of Commons but the other day, a "mere voluntary association," but now stand in the same relation to Government as other professional bodies who hold compulsory examining powers. But with new powers and a correspondingly improved position, are associated new and increased responsibilities which must not be forgotten.

The latest Pharmacy Act is but the consummation of twenty years' steady effort in a fixed direction, and embodies the acceptance of principles the Pharmaceutical Society was founded to support; and we may well now pause for a moment to see exactly where we are—how we stand in respect to the community at large, and to the higher branches of the medical profession. The legislature has, with general approval, given to us as a body a certain monopoly on an educational basis, as it has done heretofore to lawyers, surgeons, and others. Now, with the horror that exists of anything like a protective policy such a step could not have been taken without a prospect of some adequate advantage in return, and this is looked for in the increased safety that must accrue from having a specially educated body of men to perform certain duties,—precisely the same object, in fact, as that for which similar privileges have long been enjoyed by other professional corporations. There are still many matters left unsettled, which one day or other will need the attention of the Legislature, but in this one thing there is nothing more that can be done for us:—Parliament has done all that lies in its power to make pharmacy a profession. It rests with us, and most of all with our younger members, who will be the first to reap the full advantage of the newly accorded privileges, to qualify ourselves for the enlarged sphere opened to us. No mere curriculum of college instruction can impart that sort of intellectual cultivation and tone of thought that places a man above the category of tradesmen. This is true of the already recognized professions, much more so of us; and we may well look to those now commencing their studies, who in the course of nature may expect to see the new order of things that time must bring, to qualify themselves by closer mental training for that higher social position which it will be their own fault if they do not occupy.

Amongst the most gratifying features in our recent parliamentary experience are the absence of opposition on the part of the public, and the general approval with which the provisions of the Act have been received by the medical profession; the former testifies to the spread of intelligent views in respect to the just privileges of educational qualifications, as opposed to a specious misap-

plication of the principles of free trade,—the latter to the increased goodwill of the body with whom, most of all, it is our interest to work in harmony. We now and then have evidence that, even yet, there exists some remnant of an old jealousy. It sometimes shows itself in the correspondence columns of the medical periodicals, it may be traced in recent parliamentary debates, and we are conscious of it even in the proceedings of the Medical Council; and seeing that pharmacy can never take its right place until it is in complete harmony with the other divisions of medical practice, it is worth while to seek the cause of this lingering mistrust, and to learn how far it is remediable. The charges brought against us take a number of forms:—we are held answerable for the effects of the law in respect to patent medicines, for vexatious Excise regulations, and for other similar anomalies; but in whatever way it is surrounded, by whatever collateral circumstances it is supported, the complaint is invariably centred in the practice of "counter-prescribing."

I know this is delicate ground to enter upon in an assembly of pharmaceutists, but it embraces a question of infinite importance, which must be settled without reference to personal interest, real or supposed; and it is more than ever urgent at the present juncture that it should be fairly and openly met. So long as it can be said in the General Council representing the medical profession, as it was in effect said but a few months ago, that our efforts towards improving the status of pharmacy ought to be opposed, because they show no disposition to prevent chemists from acting as medical practitioners, there should be no mistake as to the views we entertain on the subject. It was not for us to introduce clauses into our Bill imposing impracticable restrictions of whatever sort, but it is for us to say, as we can say very distinctly, that the course our Society has consistently followed for the past thirty years has been to oppose all interference on the part of chemists with offices for which they have no qualification,—in other words, to promote to the full the distinction between *prescribing* and *dispensing* medicines. I am far from believing that any hard line of demarcation can be drawn between the medical sciences or the practices founded upon them: surgery, medicine, and pharmacy are as much an example of "continuity" as the development of species or the correlation of the physical forces: but I do urge that the offices pertaining to each department should, in common fairness, if from no better reason, be left to those who have special qualifications for their fulfilment. I trust I am distinctly understood that by this I do not animadvert on the occasional recommendation by chemists of simple remedies in cases of emergency, or for those little ills of daily life, commonly regarded as too trivial for anything beyond homely treatment. This is not what medical men complain of. What is deprecated is a deliberate trespassing in a province distinct from our own,—the interception of practice rightly pertaining to the qualified prescriber. We each have a duty in this matter, and my conviction is that the line of duty coincides with that of our own interest. I am well aware that there are some amongst us who uphold the state of things which still exists, more or less, in respect to counter-practice, urging in defence that their legitimate calling is injured by so many medical practitioners dispensing their own medicines. No doubt this is a grievance, but it is no defence. In a large number of instances it would be impossible for a medical man to practise without dispensing also, and in many cases in which we think a separation of the two functions would be easy we must make large allowances for a custom, strictly legal, which is often followed out of deference to the convenience of the public, even in opposition to the tastes of the practitioner. The relations between medicine proper and pharmacy have been till now so ill-defined that much forbearance is needed on all sides whilst things are settling into their proper order. Medical practitioners, from time immemorial, have been ac-

customed to dispense, indeed, time was when they alone were properly qualified for the purpose; and, for the state of things we desire, we must rely on the change that is gradually taking place in medical education, which tends more and more towards physiology and therapeutics, and concerns itself less and less with pharmacy and materia medica.

On the other hand we may fairly claim from the medical profession equal consideration, since we like themselves are but servants of the public, whose ideas of right and wrong, in respect to medical advice can only be reformed by a sort of educational process. Most of all it is for us to show that practice in those branches of medical science to which we are specially devoted may safely be left in our hands, and in the mutual confidence thus established, the ground for jealousy will soon disappear.

The importance of these ethical considerations, read in the light of our new responsibilities, must be my apology for their introduction here, and the expression, however imperfectly, of the views I have endeavoured to bring before you, enables me with lighter mind to approach the main object of my address.

To you, gentlemen, who are assembled to-night as your commencement of student-life in this Institution, I speak on behalf of those who watch over its affairs, and in their name I bid you welcome—not in the mere formal expression of words prompted by a distant courtesy, but as to younger brethren in the same vocation, with the hearty grasp of new-found fellowship. *We* have in this relationship an almost equal interest with yourselves that you should reap the uttermost advantage, intellectual and social, from your connection with this School. You are met together here under widely differing circumstances, but with the same general object, that object being *systematic study*. I use the word *systematic* because it expresses the chief value of the sort of study you are about to engage in, and represents precisely the quality which most of you have not hitherto been able to attain. It is too often the case that the period of life which you are now entering upon is the only one in which general systematic study is possible. We may—nay, if we do rightly, we must—ever remain students; but the quest of knowledge, especially of scientific knowledge, during the intervals of business or in the moments spared from professional toil, is beset with difficulties, and the results obtained are of themselves fragmentary and unconnected. It is in after life that the man who has done his elementary work well and systematically reaps its full advantage; for he has ready a framework, more or less elaborate, in which each new truth finds a natural place. Possibly there is not one of you who has not an acquaintance with a number of facts in chemistry, materia medica, pharmacy, and even in botany; facts partially acquired by reading, but more by casual, I had almost said by accidental, observation, whilst engaged in the practical duties of the laboratory or the dispensing counter. These are of but little value, from their want of connection, and inspire their possessor with no confidence so long as they are held with the unavoidable consciousness of the extent of the unknown by which they are surrounded and separated. The human mind, in respect to any particular department of knowledge, may be likened at the outset to a blank map of a country on which even the outline is but dimly traced, and its relation to surrounding states ill-defined. If we scatter a few landmarks over its surface to represent the items of knowledge obtained by the casual observation I have alluded to, we reflect the condition preceding systematic study. The object is then to cover the ground with these landmarks as completely as time and opportunity permit, and what is even more important, to lay down those principles which, like high-roads, not only mark the way to the points that have been determined, but also show the connection between them. The facts you have already gathered may not even be your starting-point, but if not, you

will find the right places for them somewhere in your progress, and as by the addition of fact to fact, of landmark to landmark, the surface-aspect of the region you are surveying becomes familiar, you will by degrees ascend to higher ground, and there obtain clearer views of its natural boundaries. The *amount of detail* you can impart to your work is no doubt partly dependent on the opportunities at your disposal and the bent of your mental powers, but its *accuracy* and *usefulness* depend on conditions entirely within your own command. Of these conditions the first in importance is *system*, or, to put it before you as it bears upon your own course, rather than in the abstract,—regularity in the attendance of lectures, demonstrations, and laboratory practice. Each step in scientific knowledge is dependent upon the one that precedes it, and bears an equally close relation to that which follows. To miss a single lecture in a course consisting of a hundred seems a trifling matter,—exceedingly trifling when under the spell of those allurements that are ever so near when human nature is weakest,—but the real loss is not to be measured by mere numerical proportion. It may easily happen that an acquaintance with a principle expounded in the neglected discourse is essential to the proper comprehension of many that follow. A German author, Richter, speaking of this sort of steady persistence in following out a well-devised course of education, concludes a paragraph with words like these, "Regularity is unity, unity is Godlike, only the Devil is changeable."

I have no desire to burden you with many precepts in respect to your mode of study, indeed, if I were sure I should be fully understood, I would put into one word all I have to say—be THOROUGH. The temptation to be content with surface-work, to accept the appearance for the reality, the gilt for the gold, is always great, but it is naturally strongest if the prospect of having to pass certain examinations be too prominently kept in view, or, from any cause, comes to be regarded as the aim and end of study. No one seriously supposes that any permanent advantage is derived from superficial study, or deliberately lays himself out for a course of smattering. Intentions are ever good at starting, but it needs a determined and sustained effort to resist the compromises between inclination and duty that soon begin to present themselves. Enthusiasm and the excitement attending a complete change of occupation will carry most young men through the first stage of student-life without much drain on their store of good resolutions, but there comes a period, after the vigour of the first dash has cooled, when the drudgery of learning seems far to outweigh the fruits of knowledge, and then it is that so many of those who begin with fair promise seem to fall away. It is in this interval of discouragement that the mind most needs the support of good resolutions, for it is only by degrees that a false estimate can be seen in a truer light. There are two allies waiting to help him who will persevere but a little longer,—the force of habit, which is each day gathering strength to make the dreariest routine bearable, and that principle, born of curiosity, which, with the gradual acquirement of knowledge, engenders an increasing thirst for more. It is in this stage that the temptation is strongest to be content with superficial study, when the attendance of lectures is apt to become a formal thing, accepted as a task, in the hope that just sufficient knowledge may be obtained for examination purposes. Shun so baneful a self-deception. The listless attendance of lectures can be of no real service. It is a mistake to suppose that another can teach you; all that the most gifted professor can do, is to show you the way to learn and to place before you facilities for the exercise of your own industry. The right acquirement of knowledge is an individual work that no man can perform for you. Two persons may easily attend the same lecture and give to it the same apparent

amount of attention, and yet derive very different benefit from it. One will bring away indistinct general impressions such as the arguments and illustrations made on his mind at the moment; the other will have possessed himself of a clear and definite outline of the natural law, of which the arguments and illustrations were only intended as the support.

In learning a principle, strive to know the phenomena from which it has been deduced; in the acquirement of facts, seek to associate them with the laws by which they are explained. A problem which you have worked out for yourselves will remain your own; whilst one you have accepted easily on hearsay is likely as easily to slip from your memory. It has often been said, and it cannot be too often repeated, that "there is no royal road to knowledge." Truly there is no smooth highway, and the many tempting byeways that diverge from the straight course, green, sunny, and seductive, that promise to lead to the same goal, soon show, though winding and deceptive and not easily traced, that to whatever end they do lead it is not the one desired. You may know them only by one fact, they always tend, just a little, downwards. The right road is up-hill,—rough near its outset and marred by obstacles that at a little distance look formidable. These are surmounted by toil and perseverance, but the achievement brings new spirit into the work,—the byeways lose their fascination and new difficulties are sought rather than avoided. The condition in which the drudgery of the onset becomes a labour of love, is attainable by any of you, and, until it is attained, scientific progress is hard and uncertain. Would you strive for it, the watchword is THOROUGH!

These remarks on the spirit of right study need some corresponding allusion to a subject not less important in its influence, namely, recreation. By recreation, I mean the employment of that considerable portion of the available time of each day which is not occupied by lectures, laboratory or museum work, and similar duties. Part of this leisure is properly given up to relaxation, that is to amusement, pure and simple; and, whilst pursued within right limits, so that the indulgence does not cause a distaste for more serious employment, no one will grudge the time so spent. It is the complete unbending that preserves the elasticity of the bow, and the mind requires equally its seasons of relief from strain. But it is necessary to bear in mind that amusement is no part of your present object, and it should be regarded as an indulgence, sometimes admissible, rather than as a primary consideration in student-life. It would be impossible to lay down a distinct line between right and wrong amongst the recreations which lie within that moral law whose obligations we all admit. Amusement harmless to one, may, from the fascination it exercises over a differently constituted mind, be baneful to another. Mental and physical requirements differ in each individual, but one axiom is true alike for all,—when a pursuit, however harmless it may appear, presents attractions that lead to the neglect of duties, or when it is followed by a reaction of listlessness and enervation, it proclaims its own unsuitability. Take amusement in moderation, and of such a sort as leaves the appetite for study unimpaired. Bear in mind that self-denial brings its own speedy reward.

I do not hold, as many appear to do, that London differs materially from other great cities in its moral atmosphere. It is true that in some respects temptations are more rife, but it is at least equally true that opportunities for good are more conspicuous than in smaller places. There is a larger choice for both good and evil, and in no respect is this more manifest than in the range of amusement. Still there is a lesson to be drawn from the saddening as from the cheering experience of the past, and those whose connection with this school enables them to dwell on former Sessions, will call to mind many

many instances of students who, whilst conducting themselves with general and ostensible propriety, have failed to take the position foreshadowed by the earlier portion of their course, through disregard of the proper relation of amusement to study. We need not wonder that this has been so, for ability to withstand the attraction of pursuits innocent in themselves, implies an amount of self-denial which mental discipline alone can give, but we may draw from it the reiterated warning that things intrinsically harmless become a snare in proportion to their seductive influence on the individual.

But if this light sort of amusement is to absorb so small a fraction of the time not occupied under the direct supervision of teachers, how is the remainder to be employed? When the mind has about it the vigour of youth, change of occupation is of itself relaxation. Each of you desires to be something more than a mere chemist and druggist,—to take a position in society quite apart from that gained by technical ability. This is what must be kept in view in determining the employment of your leisure. As far as opportunities permit, cultivate a taste for literature and general science. A fair knowledge of our English classics, is, at the present day, almost essential to one laying any claim to a respectable education, and assuredly there is no mental training, except the direct observation of the works of God, that is at once so varied, so ennobling, and so instructive, as that to be derived from the writings bequeathed to us by the great men whose inner life they portray.

Of the cultivation of scientific tastes, or rather of those departments of science which depend on the direct observation of natural objects and phenomena, I hesitate to speak, for I have before me the words of Sir Philip Sydney, in the introduction to his 'Apologie for Poetrie'—"*Selfe-loue is better than any guilding to make that seeme gorgious wherein our selues are parties;*" and I dare only urge what I have to say, in so far as it is a well-supported testimony, not on the ground I should have preferred—that of personal experience.

I will not allude in any prominent manner to botany, for in some of its many bearings it will, happily, form a part of your daily work; and its claims as a study and a recreation have been alike ably set forth on many occasions, by one who will not fail to present them to you in their clearest light. I owe too much to the teaching of Professor Bentley to dare to follow him in an exposition of the advantages to be derived from the pursuits with which he has identified himself. I wish now to take a far wider ground, and without indicating any individual group of created things, as more worthy than the rest of loving regard and intelligent observation, I would only urge a general claim on their behalf. The advantage of employing some part of your leisure time on subjects collateral with those which occupy you in class, is even greater than might be looked for. The history of the animal and mineral kingdoms cannot be unimportant in its bearing on the branches of science which occupy the chief part of your attention. Zoology has the closest relationship to botany, mineralogy to chemistry, and if denied the opportunity of pursuing either line of observation in the field, there is still left for you the microscope, which, from the most accessible materials, will open to you a new world of wonder and delight, and one which will lead you, as you become adepts in what Schleiden calls the "art of seeing," to those still too little-cultivated departments of research,—micro-chemistry and micro-pharmacy.

The additions you may thus make to your store of facts are of themselves valuable; but far more so is the interest awakened by a voluntary pursuit of this sort. It is a ray of sunshine which soon spreads beyond its first narrow range, till it brightens even those dull chapters which are inevitable portions of all routine study.

There is yet another aspect in which study of natural science is even more important,—just as a healthy tone of mind is of greater price than intellectual accomplishment,—I allude to its soothing and humanizing influence, which seems intended as the natural antidote to the worry and the rough usage of the world. The lesson drawn from the "lilies of the field" had, possibly, a wider significance than even those to whom it was addressed could fully appreciate. It was from deep experience that our great poet-philosopher could say,

> "that Nature never did betray
> The heart that loved her; 'tis her privilege,
> Through all the years of this our life, to lead
> From joy to joy: for she can so inform
> The mind that is within us, so impress
> With quietness and beauty, and so feed
> With lofty thoughts, that neither evil tongues,
> Rash judgments, nor the sneers of selfish men,
> Nor greetings where no kindness is, nor all
> The dreary intercourse of daily life,
> Shall e'er prevail against us, or disturb
> Our cheerful faith, that all which we behold
> Is full of blessings."

Some will be disposed to urge that the standard I have set is a high one, and I do not affect to deny it. Better to strive towards high attainment, even though we may, through human weakness, fall short of it, than to rest contentedly on a lower level. Life is ever a compromise between the aspirations of our best moments and the obstacles that mar their fulfilment, and the higher the aim, when coupled with honest endeavour, the better the accomplishment. To some are given larger, to some smaller opportunities, but the same responsibility pertains to all, that they should be employed to the utmost, whether in the greater or the humbler sphere. If it were not for the fear of saying too much, I might, in conclusion, try to draw a picture for the encouragement of even the youngest here,—a word-picture from actual life, that would be a justification for even more than I have said. I would tell you of one gone from us who still lives in the memory of some now present; of one who, with fewer privileges of early education than most of you, and dependent on the same avocation as ourselves for his livelihood, yet attained a name and an influence that the greatest might envy. Born in Spitalfields a hundred years ago, engaged in early life in an uncongenial occupation, and, even at the age of seventeen, scarcely in a position to anticipate that pharmacy would be his calling, and still within a few years—diligent alike in matters of business and in pursuits beyond the pale of its multifarious demands—in the front rank not only as a pharmaceutist, but in scientific and social relations. Take an opportunity of looking at the portrait that hangs over the mantelpiece of our Council Room, of William Allen, the first President of this institution, who, dying at a venerable age, did but see the Society through its first infancy and gave it his blessing. You may trace even in the picture his philosophic calmness and large-hearted benevolence. I should the more have liked to have read to you the lesson of his life, because, by his loss at so early a period of our history, his name is not associated with the great struggles in which we have been engaged, and stands in danger of being overlooked amongst us. I have said that his youth gave him no special advantages either pecuniary or educational; he had to *work his way* (we know what that means) to succeeding positions of increased responsibility in that well-known pharmacy in Plough Court, of which he eventually became the principal, and with which his name is inseparably connected. With all this

he ever found time for something beyond mere business; and whilst his name is most familiar to us as leader in our own profession, he is, out of our Society, regarded rather as the man of science, whose memoirs on Carbon, on Carbonic Acid, and on Respiration, were amongst the finest researches of their day —as the friend and associate of Davy, Wollaston, Berzelius, De Luc, and others of that noble fraternity of chemists and physicists—as the brilliant and fascinating lecturer on chemistry at Guy's Hospital and the Royal Institution;—or, on the other hand, as the philanthropist, labouring hand-in-hand with Clarkson, Brougham, Wilberforce, and the rest of that devoted band to whom civilization owes the suppression of the slave-trade, the amelioration of a barbarous penal code, and the initiatory steps in the spread of education. If success in its best sense be what you look for, surely such a career is worth emulation, and there is but one means through which it may be attained,—a means that will certainly bring its reward, whether it be precisely in the way we look for it or not; call it diligence, devotion, earnestness, or that combination of all comprised in the word *thorough*, or, if you will, take home to yourselves that older injunction of King Solomon, "Whatsoever thy hand findeth to do, do it with all thy might."

SPECIAL GENERAL MEETING.

A Special General Meeting of Members was held at 17, Bloomsbury Square, on Wednesday, October 14th, for the purpose of considering and approving certain alterations in the Bye-laws rendered necessary by the provisions of the new Pharmacy Act. Mr. Sandford, President of the Society, occupied the chair.

The SECRETARY having read the notice convening the meeting,

The CHAIRMAN said the alterations made in the bye-laws were simply those necessary to carry out the provisions of the Act of 1868; but if any gentleman present desired special information on any point, Mr. Flux, who had superintended the reconstruction of the bye-laws, would be happy to afford it.

Mr. FLUX said he was quite ready to go into details if any one desired it, but he did not apprehend it was necessary, the alterations being simply those requisite to constitute the machinery for working out the new Act. The bye-laws could not alter the law, but were simply intended to give effect to it; and as a copy had been handed to each member present, he apprehended they might be taken as read and confirmed. (They will be found at the end of this report.)

Mr. DEANE said he believed there were no alterations made in the bye-laws except what were necessary, but there was one rather important addition, which he thought would be considered a very acceptable one; he referred to clause 2 of section xxi., which provided that persons registered as Pharmaceutical Chemists under section x. of the Act of 1852, should be entitled to possess and use a diploma stamped with the seal of the Society. This gave what had not been given before, and he believed would be hailed as a very desirable addition to the bye-laws.

Mr. FLUX, noticing Mr. Dickinson present, drew that gentleman's attention to clause 6 in section i., as making a provision which he had on a former occasion wished to introduce, as it excluded from the register of Pharmaceutical Chemists henceforth all who did not pass the Major examination.

Mr. DICKINSON said he really had no particular interest in the matter, and indeed did not know that the meeting was to be held, and was present quite accidentally. That, however, might be his own fault, as, if he had read the

Journal carefully, he would have seen the notice calling the meeting. It struck him that sufficient publicity had not been given to these proposed bye-laws for the members of the trade generally to know what they were. He believed they had not appeared in the Journal, and therefore the trade were met, according to Act of Parliament, to confirm these bye-laws and send them to the Secretary of State, when they really knew nothing about them. He thought they should have been submitted to the trade for consideration, before they were asked to confirm them.

Mr. FLUX pointed out the great difference between the present and the former occasion on which the bye-laws were altered. They were now, to a certain extent, working against time. The Act of last session necessitated the provision of certain machinery, and that that should be got ready in time for gentlemen to come and qualify themselves under it, so as not to be shut out from the exercise of their calling on the 31st December, 1868. Under these circumstances, there was really no time to lose. If these amendments were published in the Journal for November, there would then have to be a meeting in the middle of November, and after that they would have to go to the Privy Council (not as before, simply to the Secretary of State), and they did not know when a Privy Council might be called competent to deal with this question. Practically, therefore, they would be thrown on to Christmas, and during the Christmas holidays gentlemen would not like to come there to be examined, nor would examiners like to attend. He therefore put it to the gentlemen present that it was not only desirable, but necessary, that these bye-laws should be dealt with promptly. They were simply a continuation of the old bye-laws, prepared with the greatest care, with such alterations as Mr. Deane had called attention to, with two or three clerical alterations, and with such additions as were necessary to create and put into working order the machinery for giving effect to this new Act of Parliament.

Mr. DICKINSON said there might be reasons for urging this forward, but he believed there was never anything gained by acting precipitately. He did not think Pharmaceutical Chemists, and those who wished to become such, would suffer by a little delay. As far as he had been able to gather, their present machinery was pretty nearly perfect, and every one knew what he had to do in order to become registered under the new Act; and he imagined they could have conducted the examinations under the old bye-laws. Everybody had read the Act of Parliament, and knew all about it; and as they would now have a larger constituency, he thought it very desirable that the bye-laws also, which would be almost equivalent to an Act of Parliament, should be thoroughly well known.

The CHAIRMAN remarked that it would be competent to them hereafter to establish new bye-laws if necessary; but in the present case there was no departure from the principle of the old bye-laws, and the passing of them immediately would be a great benefit to the trade at large.

Mr. VIZER agreed with Mr. Dickinson that these things should not be gone through too hurriedly. The additions and alterations, in his opinion, ought to have been made public in the Journal, or notice sent round to the members in some way.

The CHAIRMAN said there had been no time to insert the new bye-laws in the Journal.

Mr. VIZER thought it was evident, from the smallness of the meeting, that the trade generally did not know much about the matter.

The CHAIRMAN said it was necessary, before new bye-laws could be submitted to the members for confirmation, that they should be passed at three meetings of the Council; they might be read if it were considered desirable.

Mr. VIZER said there was no occasion to read anything but the amendments.

Mr. DEANE said there were no amendments. They were simply the old bye-laws with those additions and verbal alterations that were necessary for carrying out the new Act. In spirit they were the old bye-laws without any alteration except that to which he had before alluded. It was for this reason that the Council had felt no difficulty in bringing them at once before the members.

The CHAIRMAN said it might assist those who felt any difficulty if Mr. Flux would kindly read the new bye-laws.

Mr. FLUX accordingly went through the bye-laws *seriatim*. In section i. clauses 1 to 3 corresponded with similar clauses in the old bye-laws; clause 4, which he read, was necessary to confer the privileges provided by the statute of 1868. Clauses 5 and 6 perpetuated former bye-laws. Clause 7 he read, as an addition, carrying out in the case of associates the same principle which had hitherto applied to members. Clauses 8 to 11 required no comment. Clause 12 was a new one, providing for the payment of an entrance fee of two guineas by persons becoming members in exercise of the privileges conferred by the new Act.

Mr. VIZER said that seemed a material alteration. Hitherto persons had been able to become members simply by application to the Council.

Mr. FLUX said that was not so; hitherto, since 1852, members had been required to pass the Major examinations; but now there was a limited class of members admitted by the new statute, from whom this entrance fee of two guineas would be required. They would pay no fees on registration, or anything of that kind; and, after mature consideration by the Council, this was considered a very moderate and proper fee. Clause 13 corresponded with the old clause 10, and 14 practically corresponded with the old clause 12. Clauses 15 and 16 corresponded with previous provisions; 17 was read as being a new one, and also 18 and 19, consequential thereon. In section ii., clause 1 was identical with the old one; clause 2 being slightly different, was read, though it only carried out what had been the practice of the Council. Section iii., relating to the common seal, was as before. Section iv., relating to the bye-laws, was the same as before, in clause 1, with the exception of requiring confirmation by the Privy Council, instead of the Secretary of State; clause 2 provided that a copy of the bye-laws should be given to every member and associate on election, and that it should be furnished at any time to any member, associate, apprentice, or student, on payment of 1*s*. Section v., as to the election of Council and Auditors, was the same as before, except that, according to the new statute, the privilege of using voting-papers was extended to town members, so that in future there would be only one form of voting. Then it set up the requisite machinery for dealing with a certain class of candidates, made eligible under the new Act. Chemists and druggists in business at the time of the passing of the Act and becoming members, were made eligible to seats at the Council, with the limitation that no more than seven of such members shall be on the Council at any one time, and these bye-laws provided the requisite machinery for conducting the elections accordingly. Section vi. agreed, word for word, with the old one, as did also sections vii., viii., and ix. Section x. contained the machinery for carrying out the provisions of the new Act, which did not contemplate any other than the Minor examination; if chemists and druggists desired to become Pharmaceutical Chemists, they must be examined in accordance with the provisions of the Act of 1852. Clauses 11 to 16 were read. Section xi., relating to the registrar, etc., contained simply such verbal alterations as were needed under the new Act. Section xii. was identical with the old one, and so practically was xiii., only it increased the security to be given by the

Secretary to £500, and enabled him to pay all accounts, due by the Society, without restriction as to the amount. Section xiv. was the same as before.

Mr. DICKINSON, interrupting, asked if it were contemplated that in future there should be two classes of persons engaged in the business, viz. Chemists and Druggists and Pharmaceutical Chemists. Some of his friends contended that this was so, but he had held an opposite opinion, and was under the impression that the class of chemists and druggists simply would die out, and that, in the course of time, all men practising pharmacy, would be Pharmaceutical Chemists. He wished to know what would be the status of those who were Pharmaceutical Chemists by membership, not having been examined,—his own case,—if, for instance, he ceased to pay his subscription, what would be his position.

Mr. FLUX said, in such a case he would go into the ranks of the chemists and druggists, the same as if the new Act had not been passed.

Mr. DICKINSON said he knew that was the intention under the old bye-laws, which he believed, on grounds which he need not state, would not hold water as a bye-law, but it was important to consider the case, which might arise, of gentlemen who imagined that being registered as Pharmaceutical Chemists under the Act, they might cease all connection with the Society; would they go back into the ranks of ordinary chemists and druggists?

Mr. FLUX: Clearly.

Mr. DICKINSON apprehended that would not be so.

Mr. SQUIRE did not think any one would give up the benefit which membership gave them for the sake of a paltry subscription.

Mr. DICKINSON said it was not a question of what would be done for the sake of a paltry guinea, but of being precise in their legislation, and understanding their exact position.

Mr. FLUX said this question did not turn on the bye-laws, but on the Act, a much higher authority, which was quite explicit on the subject. There always would be chemists and druggists and Pharmaceutical Chemists, so long as there were gentlemen who would come forward to pass the Major examination, but whether gentlemen would volunteer to pass this examination or not, they could not become anything more than chemists and druggists, unless they did so. The position of things might be illustrated by the case of the College of Surgeons, where there were gentlemen recognized as Surgeons, and others recognized as Fellows. Here Pharmaceutical Chemists would occupy the higher grade, corresponding to the Fellow of the College, but the other was equally eligible as a chemist and druggist.

Mr. DICKINSON did not think the illustration a very good one, because a Fellow of the College of Surgeons did not usually announce himself as such to the world, whereas, in the other case, a man wrote up "Pharmaceutical Chemist" over his shop-front.

Mr. FLUX said the parallel lay in this, that the law necessitated a man being qualified as a chemist and druggist if he intended to carry on the business, but it did not make it compulsory on him to become a Pharmaceutical Chemist. If he chose, he might become a member of the higher grade, possessing the title and all the benefit springing therefrom.

Mr. DICKINSON was glad to have the question cleared up, as to there being in future two classes of men in the profession.

The CHAIRMAN remarked that the reason for fixing the Minor examination as the one necessary for chemists and druggists under the new Act was, that it was asserted the other would be too high for many chemists and druggists in small country places.

Mr. FLUX then continued the reading of the bye-laws. Section xv. was the same as before, with the addition of the word "examiners" into the heading; xvi., xvii., and xviii. remained as before, but, in the latter, clause 2 was struck

out, as being no longer necessary. Section xix., relating to the Benevolent Fund, was slightly altered to meet the requirements of the new Act; xx. remained as before. Section xxi. was slightly altered, as mentioned by Mr. Deane, and was therefore read. Sections xxii. and xxiii. corresponded with the old sections, then came the schedule, and the form of the bequest was the same as before.

The CHAIRMAN then moved the following resolution :—

"That the bye-laws, whereof formulæ have been prepared and confirmed by the Council and submitted to this Special General Meeting, be confirmed and approved as bye-laws of the Society, and take effect from the date of the confirmation and approval thereof, as required by the statute now in force."

That would be from the confirmation by the Privy Council.

Mr. EVANS (Vice-President) seconded the resolution, which was put to the meeting by the Chairman, and carried unanimously.

PRESENT AND PROPOSED BYE-LAWS.

In the following Bye-laws, words importing the singular number shall include the plural number; and words importing the plural number shall include the singular number, unless there be something either in the subject or context repugnant to such construction. By the expression, "the Statute, 1852," shall be meant and intended the Statute, 15 & 16 Vict., cap. 56, intituled "An Act for regulating the qualifications of Pharmaceutical Chemists;" and by the expression "the Act 1868," shall be meant and intended the Statute, 31 & 32 Vict., cap. 121, entitled "An Act to regulate the Sale of Poisons, and alter and amend the Pharmacy Act, 1852." All the Bye-laws heretofore passed are hereby repealed.

PRESENT BYE-LAWS.

SECTION I.

MEMBERS' QUALIFICATION, ELECTIONS, AND SUBSCRIPTIONS.

1. Persons who have respectively become Members, Associates, and Apprentices or Students of the Society, pursuant to the Charter of Incorporation, the Act of Parliament, 15 & 16 Vict., cap. 56, and the Bye-laws which have heretofore from time to time been in force, shall continue to be Members, Associates, and Apprentices or Students respectively, subject to the Bye-laws in force for the time being.

2. Persons qualified to be elected Members, Associates, or Apprentices or Students of the Society, shall at a meeting of the Council be proposed and seconded by Members of the Council. The qualifications of the proposed Member, Associate, or Apprentice or Student, shall be stated in a written resolution, which, when proposed and seconded, shall be submitted to the Council, and when passed, shall confer the right of becoming a Member, Associate, or Apprentice or Student.

3. Persons registered as Pharmaceutical Chemists under Section 10 of the said Act of Parliament, and desirous of becoming Members of the Society, shall make application to the Council in that behalf.

PROPOSED BYE-LAWS.

SECTION I.

QUALIFICATIONS, ELECTIONS, AND SUBSCRIPTIONS.

1. Persons who have respectively become Members, Associates, and Apprentices or Students of the Society, pursuant to the Charter of Incorporation, the Statute, 1852, and the Bye-laws which have heretofore from time to time been in force, may continue to be Members, Associates, and Apprentices or Students respectively, subject to the Bye-laws in force for the time being. Charter, lines 69, 8 Stat. 1852, sec. x.

2. Persons qualified to be elected Members, Associates, or Apprentices or Students of the Society, shall at a meeting of the Council be proposed and seconded by Members of the Council. The qualification of the proposed Member, Associate, or Apprentice or Student, shall be stated in a written resolution, which, when proposed and seconded, shall be submitted to the Council, and when passed, shall confer the right of becoming a Member, Associate, or Apprentice or Student. Charter, lines 69, 8 Stat. 1852, sec. x.; Act 1868, sec. xviii–x

3. Persons registered as Pharmaceutical Chemists under Section 10 of the Statute, 1852, and desirous of becoming Members of the Society, shall make application to the Council in that behalf. Stat. 1852, sec. x.

4. Persons who, at the time of the Act 1868, se xviii. and xi

4. Pharmaceutical Chemists being Superintendents of Pharmaceutical establishments, engaged in the confidential management and control of the business of a Chemist and Druggist, and desirous of becoming Members of the Society, shall make application in writing, stating the grounds on which they apply. Their names shall be exhibited in the Library of the Society for one calendar month after application, and if, upon due inquiry made, the grounds of application shall be found sufficient, they shall be elected Members on production of certificates of qualification satisfactory to the Council.

5. Associates of the Society, who became such before the 1st day of July, 1842, shall be elected Members on the production of certificates of qualification satisfactory to the Council; and no other person whose name has not previously been inserted in the register of Pharmaceutical Chemists, under Section 10 of the said Act, shall be elected a Member.

6. Persons registered as Assistants under Section 10 of the said Act of Parliament, and desirous of becoming Associates of the Society, shall make application to the Council in that behalf.

7. Persons registered as Apprentices or Students under Section 10 of the said Act of Parliament shall be eligible for admission as Apprentices or Students of the Society, and, if desirous of being admitted accordingly, shall make application to the Council on that behalf.

8. All persons on election as Members, Associates, or Apprentices or Students, shall sign a written declaration, stating their full names and addresses, and their willingness to comply with the regulations of the Society.

9. All persons who have become Life Members of the Society pursuant to Bye-laws, which have heretofore from time to time been in force, shall be exempt from further contributions to the funds of the Society.

10. All Members of the Society, except Life Members, shall pay an annual subscription of one guinea.

11. All Associates and Apprentices or Students of the Society shall pay an annual subscription of half-a-guinea.

12. All persons who, prior to the 1st day of October, 1862, shall have become Associates, Apprentices, or Students, after examination, and who shall have paid their examination fees pursuant to the Bye-laws then in force, shall be exempt

passing of the Act, 1868, were or had been in business on their own account as Chemists and Druggists, who shall be registered as Chemists and Druggists, and be desirous of becoming Members of the Society, in exercise of the privileges conferred by Sections 18 and 19 of the Act, 1868, shall make application to the Council in that behalf.

5. Associates of the Society, who became such before the 1st day of July, 1842, shall be elected Members on the production of certificates of qualification satisfactory to the Council. Charter, lines 72, 73.

6. No persons other than those who have previously been registered as Pharmaceutical Chemists or Associates of the Society, who became such before the 1st day of July, 1842, or those who, at the time of the passing of the Act, 1868, were or had been in business on their own account as Chemists and Druggists, and have previously been registered as Chemists and Druggists, shall be elected Members, unless as Honorary or Corresponding Members. Stat. 1862, sec. x., Act 1868, sec. xix. xx.

7. Persons registered as Assistants, and desirous of becoming Associates of the Society, under Section 10 of the Statute, 1852, and persons registered as Chemists and Druggists, by reason of having obtained certificates of qualification from the Board of Examiners, and desirous of becoming Associates of the Society, under Section 20 of the Act, 1868, shall make application to the Council in that behalf, and no other person shall be elected an Associate. Stat. 1852, sec. x.; Act 1868, sec. xx.

8. Persons registered as Apprentices or Students under Section 10 of the Statute, 1852, shall be eligible for admission as Apprentices or Students of the Society, and, if desirous of being admitted accordingly, shall make application to the Council in that behalf. Charter, lines 80, 88.

9. All persons on election as Members, Associates, or Apprentices or Students, shall sign a written declaration, stating their full names and addresses, and their willingness to comply with the regulations of the Society.

10. All subscriptions for the current year shall become due upon election, and all annual subscriptions shall become due on the 1st day of January in every year; and if any Member, Associate, or Apprentice or Student shall not have paid his annual subscription before the 1st day of May in any year, his name shall be omitted from the Register of Members, Associates, and Apprentices or Students Charter, line 245. Act, sec. v. Charter, line 75.

from annual subscriptions to the funds of the Society, as Associates, Apprentices or Students.

13. All subscriptions for the current year shall become due upon election, and all annual subscriptions shall become due on the 1st day of January in every year, and if any Member, Associate, or Apprentice or Student, shall not have paid his annual subscription before the 1st day of May in any year, his name shall be omitted from the Register of Members, Associates, and Apprentices or Students of the Society, certified by the Council at the annual meeting. It shall be competent to the Council to restore any defaulter to his former status in the Society on payment of his arrears and any fine which it may be thought fit by the Council to impose, not exceeding half-a-guinea.

14. All persons who, before the 1st day of October, 1862, shall have paid fees on, and passed the Major Examination, and who, by reason of registration as Pharmaceutical Chemists under the said Act of Parliament, qualify themselves to be elected Members of the Society, shall, upon election to Membership, have the option of becoming Life Members exempt from further contribution on payment of a life subscription of five guineas.

15. All Members of the Society, other than those mentioned in the last-preceding Bye-law, shall have the option of becoming Life Members exempt from further contribution on payment of a life subscription of twenty guineas.

of the Society, certified by the Council at the Annual Meeting. It shall be competent to the Council to restore any defaulter to his former status in the Society on payment of his arrears and any fine which it may be thought fit by the Council to impose, not exceeding half-a-guinea.

11. All persons who have become Life Members of the Society pursuant to Bye-laws which have heretofore from time to time been in force, shall be exempt from further contributions to the funds of the Society. Charter, lines 74, 7

12. All persons becoming Members of the Society, in exercise of the privileges conferred and defined by Sections 18 and 19 of the Act, 1868, shall on election pay an entrance-fee or sum of two guineas, exclusive of an annual subscription.

13. All Members of the Society, except Life Members or Honorary and Corresponding Members, shall pay an annual subscription of one guinea. Charter, lines 74, 7 245.

14. All persons who, before the 1st day of October, 1862, paid fees on, and passed the Major Examination, and who, by reason of registration as Pharmaceutical Chemists under the Statute, 1852, qualified themselves to be elected Members of the Society, shall have the option of becoming Life Members exempt from further contribution on payment of a life subscription of five guineas. Charter, line 245.

15. All Members of the Society, other than those mentioned in the last-preceding Bye-law, shall, after having paid the entrance-fee, if any payable, have the option of becoming Life Members exempt from further contribution on payment of a life subscription of twenty guineas. Charter, line 245.

16. All persons who, prior to the 1st day of October, 1862, became Associates, Apprentices or Students, and who may not for the time being be entitled to exercise and be exercising any privilege created by Sect. 20 of the Act, 1868, shall be exempt from annual subscriptions to the funds of the Society, as Associates, Apprentices or Students respectively.

17. All Associates, Apprentices, and Students, other than those exempted by the last-preceding Bye-law and other than Associates entitled to continue and continuing Associates, being in business on their own account, shall pay an annual subscription of half-a-guinea. Charter, lines 87, 245.

18. All the Associates who, under Section 20 of the Act, 1868, are entitled to continue, and are desirous of continuing as such Associates, being in business on

their own account, shall give notice to the Secretary in that behalf, and shall, in accordance with the same section, contribute to the funds of the Society the same subscriptions as Members, and in default thereof shall cease to be Associates.

19. Persons who have exercised the privilege of continuing Associates whilst in business on their own account, shall, on ceasing to be in business on their own account, give notice thereof to the Registrar, and the Registrar shall thereupon, without fee, amend the Register of Associates, in accordance with such notice, and the Associates shall, whilst so ceasing to be in business, pay the annual subscription of half-a-guinea.

SECTION II.

HONORARY AND CORRESPONDING MEMBERS.

1. The Council shall at their discretion elect as Honorary and Corresponding Members of the Society such scientific men as have distinguished themselves in any of the branches of knowledge embraced in the educational objects of the Society.

2. The name of each person proposed for election as an Honorary or Corresponding Member of the Society, must be exhibited in the Library for one calendar month prior to his election; and the party so proposed must be balloted for at the first meeting of the Council next after the expiration of the month.

SECTION II.

HONORARY AND CORRESPONDING MEMBERS.

1. The Council shall at their discretion elect as Honorary and Corresponding Members of the Society such scientific men as have distinguished themselves in any of the branches of knowledge embraced in the educational objects of the Society. Charter, lines 204, 207.

2. The Council shall from time to time determine the number of persons to be Honorary and Corresponding Members, and there shall be a book kept by the Council, in which Members of the Council shall enter the names of persons whom they may consider eligible for election, and at the meeting of the Council in April of every year names shall be selected from the book so to be kept, not exceeding in number the vacancies in the list of Honorary and Corresponding Members, and the names of the persons so selected shall be exhibited in the Library until the meeting of the Council in the ensuing month, when the Council shall proceed to the election.

SECTION III.

COMMON SEAL.

1. The Common Seal of the Pharmaceutical Society of Great Britain shall consist of the armorial bearings, crest, and motto, registered in Her Majesty's College of Arms.

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COMMON SEAL.

1. The Common Seal of the Pharmaceutical Society of Great Britain shall consist of the armorial bearings, crest, and motto, registered in Her Majesty's College of Arms. Charter, line 30.

2. The said seal shall be deposited at the house of the Society, in a box having a lock and two keys, one of which shall be in the custody of the President, and the other in that of the Vice-President.

3. The Common Seal shall not be set or affixed to any deed, instrument, or writing whatsoever, unless in the presence of the Council of the Society, and in pursuance of an order or minute entered in their books.

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3. The Common Seal shall not be set or affixed to any deed, instrument, or writing whatsoever, unless in the presence of the Council of the Society, and in pursuance of an order or minute entered in their books.

SECTION IV.

BYE-LAW.

The making, altering, or abrogating any Bye-law shall be in the following manner :—

1. A written formula for any proposed Bye-law, or for altering or abrogating any Bye-law, being delivered by a Member of the Council to the Chairman, shall thereupon be read, and, if seconded and approved, shall be referred to the next meeting of the Council for confirmation, and be subsequently dealt with according to the provisions of the 15 & 16 Vict., cap. 56, and the Royal Charter of Incorporation.

2. A copy of the Bye-laws shall be given to every Member of the Society on his applying for the same.

SECTION IV.

BYE-LAWS.

The making, altering, or abrogating any Bye-law shall be in the following manner :—

1. A written formula for any proposed Bye-law, or for altering or abrogating any Bye-law, being delivered by a Member of the Council to the Chairman, shall thereupon be read, and, if seconded and approved, shall be referred to two subsequent ordinary or special meetings of the Council for confirmation, and then to a Special General Meeting of the Members of the Society, and afterwards to the Privy Council, according to the provisions of the Statute, 1852, as amended by the Act, 1868. Charter, lines 226, 256, 263.

2. A copy of the Bye-laws shall be given to every Member and Associate of the Society on his election, and shall at any time be delivered to any Member, Associate, Apprentice or Student of the Society on his applying for the same, and paying one shilling.

SECTION V.

ELECTION OF COUNCIL AND AUDITORS.

1. Two-thirds of the Members of the Council shall go out of office in every succeeding year, and the Members so retiring shall be those who have been longest in office, computing from their last election. If upon any such retirement more than one-third of the Members of the Council shall have been in office for the same period, the other retiring Members shall be determined by lot.

2. The retiring Members of the Council shall be ascertained and determined

SECTION V.

ELECTION OF COUNCIL AND AUDITORS.

1. Two-thirds of the Members of the Council shall go out of office in every year, and the Members so retiring shall be those who have been longest in office, computing from their last election. If upon any such retirement more than one-third of the Members of the Council shall have been in office for the same period, the other retiring Members shall be determined by lot. Charter, lines 148, 163.

2. The retiring Members of the Council shall be ascertained and determined at the monthly meeting held in February of

at the monthly meeting held in February of every year, and the names shall be advertised on or before the 10th day of March in every year.

3. Any Member of the Society desirous of nominating another Member for election as a Member of the Council or as an Auditor, shall give notice in writing with the name and address of the Candidate to the Secretary of the Society, on or before the 24th day of March in every year; and the Secretary shall ascertain whether such Candidate will accept office if elected.

4. The Council shall at their monthly meeting, held in April of every year, prepare a list of all persons nominated for election and eligible to be elected Members of the Council and Auditors for the ensuing year; and in default of the nomination of a sufficient number of persons willing to accept office, the Council shall nominate as many as may be required to augment the number to fourteen persons to be elected as Members of Council, and five as Auditors. No nominations shall be received after the 24th day of March, except such as may be made by the Council, in the manner and under the circumstances aforesaid, at the monthly meeting in April.

5. The Secretary shall issue to every Member of the Society residing in Great Britain and qualified to vote, not less than ten days prior to the meeting at which Members of the Council and Auditors, or either of them, are to be elected, a voting paper for such elections or election. The names and residences of the Candidates shall appear in such voting papers, and with regard to voting papers for the election of the Council, the names of the Members who remain in office shall also appear.

6. It being enacted by the 15 & 16 Vict., cap. 56, that Members residing within five miles of the General Post-Office, St. Martin's le Grand, London, shall vote personally, and that Members residing beyond that distance may transmit their voting papers under cover to the Secretary, at least five clear days prior to the date of election, the voting papers issued to the London and Country Members respectively shall be in the following forms marked No. I. and No. II.

every year, and the names shall be advertised on or before the 10th day of March in every year.

3. Any person qualified to vote desirous of nominating any Member for election as a Member of the Council or as an Auditor, shall give notice in writing with the name and address of the nominee, and if for the Council disclosing whether such nominee be or not a Pharmaceutical Chemist, to the Secretary of the Society, on or before the 24th day of March in every year, and the Secretary shall on or before the 26th day of March then instant address and send by post to each nominee a notice of his having been so nominated, and inquiring whether he will accept office if elected, and in default of a written reply from such nominee, declaring his readiness to accept office if elected being received on or before the 31st day of March then instant, such nominee shall be deemed not eligible and willing to be elected.

Stat. 1852 sec. ; Act 1868, sec. xix.

4. The Council shall at their monthly meeting, held in April of every year, prepare a list of all persons nominated for election and eligible and willing to be elected Members of the Council and Auditors for the ensuing year, and disclosing the qualifications of nominees for the Council; and in default of the nomination of a sufficient number of persons eligible and willing to accept office, the Council shall nominate as many as may be required to form a complete list of eligible and willing persons to fill all the vacancies in the Council, and a complete list of five Auditors. No nominations shall be received or made after the 24th day of March, except such as may be made by the Council, in the manner and under the circumstances aforesaid, at the monthly meeting in April.

Charter, line 153, a Act 1868, sec. xix

5. The Secretary shall issue to every person residing in Great Britain and qualified to vote, not less than ten days prior to the meeting at which members of the Council and Auditors, or either of them, are to be elected, a Voting Paper for such elections. The names and residences of the Members eligible and willing for election, and whether they are or not on the Register of Pharmaceutical Chemists, shall appear in such Voting Papers, and in all Voting Papers for the election of Members of the Council, the names of the Members who remain in office, and whether they are or not on the Register of Pharmaceutical Chemists shall also appear.

Stat. 1852, sec. iii.; Act 1868, sec. xix.

6. At all elections of Members of the Council and Auditors, votes may be given by ballot, either by personal delivery of the said Voting Papers at the time of election, or by the said Voting Papers being transmitted under cover to the Secretary, so that the same shall be received by him not less than one clear day prior to the day on which the election is to take place, and the Voting Papers shall be in the following form:— Charter, line 135; Stat. 1852 sec. iii.; Act 1868, sec. xxi.

No. I.—"London Members' Voting Paper, to be delivered personally on the day of Election, May , 18 ."

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN,

17, Bloomsbury Square.

For the election of Fourteen Members of the Council.

CANDIDATES.

1*_____	11*_____
2 _____	12 _____
3 _____	13 _____
4 _____	14*_____
5 _____	15*_____
6*_____	16*_____
7 _____	17*_____
8*_____	18*_____
9*_____	19*_____
10 _____	20*_____

The names against which a Star is prefixed, are those who are Members of the present Council, and who are eligible for re-election.

INSTRUCTIONS FOR VOTING.

Every Member voting must erase the names of all the Candidates for whom he does not intend to vote. If more than fourteen names be left, the Voting Paper will be rejected.

The following are the Members who remain on the Council:—

_____

_____

_____

_____

_____

_____

_____

Voting Paper to be delivered personally on the day of election, May , 18 , or transmitted under cover to the Secretary, so that it shall be received by him not less than one clear day prior to the day on which the election is to take place. An envelope duly addressed accompanies this.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN,

17, Bloomsbury Square, W.C.

For the election of Fourteen Members of the Council.

NAMES OF MEMBERS ELIGIBLE AND WILLING FOR ELECTION.

1*_____	11 _____
2 P.C._____	12 _____
3 _____	13 _____
4* P.C._____	14 _____
5 _____	15 _____
6 _____	16 _____
7 _____	17 _____
8 _____	18 _____
9 _____	19 _____
10 _____	20 _____

The names to which Stars are prefixed, are those of Members of the present Council who are eligible for re-election.

The names to which the letters P.C. are prefixed, are those of Pharmaceutical Chemists.

The names to which the letters P.C. are not prefixed, are those of persons who are not on the Register of Pharmaceutical Chemists.

INSTRUCTIONS FOR VOTING.

Every person voting must erase the names of all the Candidates for whom he does not intend to vote. If more than fourteen names be left, the Voting Paper will be rejected. Section 19 of the Act, 1868, is printed below.

The Voting Paper, after the erasure of names, should be folded up, and must be transmitted under cover to the Secretary, so that the same shall be received by him not less than one clear day prior to the day on which the election is to take place, or delivered by the voter personally at the time of election.

To prevent imposition, the Member must sign his name and address on the line on the outside of the cover.

The following are the Members who remain on the Council:—

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN,
17, Bloomsbury Square.

Voting Papers, May, 18 , *for the Election of Five Auditors.*

CANDIDATES.

1 _____
2 _____
3 _____
4 _____
5 _____
6 _____
7 _____

INSTRUCTIONS FOR VOTING.

Every Member voting must erase the names of all the Candidates for whom he does not intend to vote. If more than five names be left, the Voting Paper will be rejected.

No. II.—"Country Members' Voting Paper, to be delivered personally on the day of Election, May , 18 , or returned to the Secretary in the accompanying envelope on or before the day of May, 18 ."

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN,
17, Bloomsbury Square.

For the Election of Fourteen Members of the Council.

CANDIDATES.

1* _____	11* _____
2 _____	12 _____
3 _____	13 _____
4 _____	14* _____
5 _____	15* _____
6* _____	16* _____
7 _____	17* _____
8* _____	18* _____
9* _____	19* _____
10 _____	20* _____

The names against which a Star is prefixed, are those who are Members of the present Council, and who are eligible for re-election.

INSTRUCTIONS FOR VOTING.

Every Member voting must erase the names of all the Candidates for whom he does not intend to vote. If more than fourteen names be left, the Voting Paper will be rejected.

The Voting Paper after the erasure of names, if not intended to be delivered personally, must be folded up, and enclosed in the accompanying envelope addressed to the Secretary.

To prevent imposition, the Member must sign his name and address on the line on the outside of the envelope.

P.C. _____

_____

P.C. _____

P.C. _____

_____

_____

P.C. _____

The names to which the letters P.C. are prefixed, are those who are Pharmaceutical Chemists.

Section 19 of the Act, 1868, is as follows :—

19. Every person who is or has been in business on his own account as a Chemist and Druggist as aforesaid at the time of the passing of this Act, and who shall become a Member of the Pharmaceutical Society, shall be eligible for election to the Council of the Pharmaceutical Society, but the said Council shall not at any time contain more than seven Members who are not on the Register of Pharmaceutical Chemists.

—— is the utmost number of Members not Pharmaceutical Chemists who can be elected on the Council on the present occasion.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN,
17, Bloomsbury Square.

Voting Paper, May, 18 , *for the election of Five Auditors.*

CANDIDATES.

1 _____
2 _____
3 _____
4 _____
5 _____
6 _____
7 _____

INSTRUCTIONS FOR VOTING.

Every Member voting must erase the names of all the Candidates for whom he does not intend to vote. If more than five names be left, the Voting Paper will be rejected.

The Voting Paper, after the erasure of names, should be folded up, and must be transmitted to the Secretary, so that the same shall be received by him not less than one clear day prior to the day on which the election is to take place, or delivered by the voter personally at the time of election.

To prevent imposition the voter must sign his name and address on the outside of the cover.

Form of Address, etc., on Envelope.

VOTING PAPER.

Member's Signature

Member's Address _____

To the Secretary of the Pharmaceutical Society, 17, Bloomsbury Square, London, W.C.

The following are the Members who remain on the Council.

_____

_____

_____

_____

_____

_____

_____

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN,

17, BLOOMSBURY SQUARE.

Voting Paper, May, 18 , *for the Election of Five Auditors.*

CANDIDATES.

1_____

2_____

3_____

4_____

5_____

6_____

7_____

INSTRUCTIONS FOR VOTING.

Every Member voting must erase the names of all the candidates for whom he does not intend to vote. If more than five names be left, the Voting Paper will be rejected.

This paper is not to be signed, but if not intended to be delivered personally, is to be folded up and enclosed in the envelope to the Secretary by the post.

Form of Address, etc., on Envelope.

VOTING PAPER.

Member's Signature_____

Member's Address_____

To the Secretary of the Pharmaceutical Society, 17, Bloomsbury Square, London.

The Voting Paper must be returned to the Secretary on or before the day of May, 18 .

The Voting Paper must be returned to the Secretary, so that the same may be received by him on or before the day of May, 18 , or be delivered personally on the day of election.

7. Before the votes are taken, the Members constituting the Meeting shall appoint from among themselves four or more Scrutineers, who shall ascertain the number of votes given for each Candidate, and make a return thereof to the Chairman under their hands, and the Chairman shall then declare the result of the election, and in case of an equality of votes, shall give a second or casting vote. The voting papers to be delivered personally shall be received at the General Meeting. The voting papers duly transmitted by absent Members shall be

7. Before the votes are taken, the persons constituting the meeting shall appoint from amongst themselves four or more Scrutineers, of whom four shall form a quorum.

8. The Voting Papers to be delivered personally shall be received at the General Meeting, and the Voting Papers duly transmitted under cover to the Secretary shall be opened by or in the presence of the Scrutineers.

9. The Scrutineers shall ascertain the number of votes given for each Member nominated for election, and in any case

opened by, or in the presence of the Chairman.

8. The Chairman at any meeting for the election of Members of the Council or Auditors, shall have the power of adjourning such Meeting from time to time, with a view to the reception of the report of the Scrutineers, but no such adjournment shall extend beyond a period of four days.

of an equality of votes, the Chairman of the Meeting shall have a second or casting vote. Charter, line 100.

10. It being provided by Section 19 of the Act, 1868, that the Council shall not at any time contain more than seven Members who are not on the Register of Pharmaceutical Chemists. The Scrutineers shall, after the voting on any election of Members of the Council, certify to the Chairman of the Meeting whether or not the number of Members not on the Register of Pharmaceutical Chemists nominated for election is more than seven, or more than may with any like Members remaining on the Council make up the number of seven; and if they shall certify that the number of Members not on the Register of Pharmaceutical Chemists nominated for election is more than seven, or more than may as aforesaid make up the number of seven, then they shall further likewise certify the number of votes given in favour of each of such Members so nominated, and which of such Members so nominated to the number of seven or the lesser number, sufficient to make up as aforesaid the number of seven, have a majority of votes over the remainder of such Members, and that such of the said Members as have not the said majority are in a minority of their class. Act 1868, sec. xix.

11. The Scrutineers shall make to the Chairman a return, signed by them of the names of the Members nominated for election, but in the case of an election of Members of the Council, such return shall be exclusive of the names of such, if any, Members not being Pharmaceutical Chemists as may be certified to be in a minority of their class, and the said return shall disclose the number of votes given for each Member named therein.

12. The Chairman of the Meeting shall declare the result of every election; and, in cases where there shall have been a poll, shall declare the election to have fallen on the Members who, according to the return of the Scrutineers contemplated by the last-preceding Bye-law, shall appear to have a majority.

13. The Chairman at any Meeting for the election of Members of the Council or Auditors, shall have the power of adjourning such Meeting from time to time, with a view to the reception of the Report of the Scrutineers, but no such adjournment shall extend beyond a period of four days.

SECTION VI.

COUNCIL.

1. The Council shall meet at the Society's house on the first Wednesday in every month at eleven o'clock in the forenoon. Seven Members shall constitute a quorum, and without that number being present no business shall be transacted; before other business is entered on, the minutes of the preceding monthly and of any subsequent Meeting or Meetings shall be read.

2. All motions or proposals shall be written, together with the names of the mover and seconder, and upon being put shall be decided by a show of hands, except in cases of a ballot, which may be demanded by any Member. Should the numbers be equal, the Chairman shall have a second or casting vote. It shall be lawful for the Chairman to postpone or adjourn to the next Meeting any motion whereof notice in writing has not been given at a prior Meeting.

3. All resolutions carried at the Meetings of the Council, except such as relate to the Bye-laws, shall be acted upon without confirmation.

4. The Council shall elect from among themselves a Committee for General Purposes, a Committee of Finance, a Committee for the Library, Museum, and Laboratory, and from time to time such other Committees as may be necessary. The President and Vice-President shall be *ex officio* Members of all Committees, and if present, one of them shall preside.

SECTION VII.

COMMITTEE FOR GENERAL PURPOSES.

1. This Committee shall consist of not less than twelve Members, four of whom shall constitute a quorum. The Committee shall meet as often as may be required, and its proceedings shall be reported to the Council.

SECTION VIII.

COMMITTEE OF FINANCE.

1. This Committee shall consist of not less than four Members, two of whom shall constitute a quorum. The Committee shall meet once or oftener in every month.

2. It shall be the duty of this Committee to regulate and examine the accounts, to check the receipt of all moneys,

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2. All motions or proposals shall be written, together with the names of the mover and seconder, and upon being put shall be decided by a show of hands, except in cases of a ballot, which may be demanded by any Member. Should the numbers be equal, the Chairman shall have a second or casting vote. It shall be lawful for the Chairman to postpone or adjourn to the next meeting any motion whereof notice in writing has not been given at a prior meeting. Charter lines 97

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2. It shall be the duty of this Committee to regulate and examine the accounts, to check the receipt of all moneys,

to examine all bills, and to present at the monthly meetings of the Council such as shall have been approved for payment, with the signature of a quorum attached. This Committee shall also prepare a balance sheet for the Auditors previous to the annual meeting.

SECTION IX.

THE COMMITTEE FOR THE LIBRARY, MUSEUM, AND LABORATORY.

1. This Committee shall consist of not less than four Members, two of whom shall constitute a quorum. The Committee shall meet once in every month and report from time to time to the Council.

2. It shall be the duty of this Committee to superintend the arrangement and preservation of the books, specimens, and apparatus, to inspect the Laboratory, and to make regulations for the admission of visitors and students to the Library, Museum, and Laboratory.

SECTION X.

EXAMINERS—EXAMINATIONS—FEES.

1. The Council of the Society shall, at the first Monthly Meeting after the General Meeting in every year, appoint two Boards of Examiners, one for England and Wales and the other for Scotland.

2. The President or Vice-President of the Society shall, *ex officio*, be members of the Boards of Examiners, and shall preside at all meetings of such Boards at which they shall be present.

3. The Board for England and Wales shall consist of not less than six Pharmaceutical Chemists, exclusive of the President and Vice-President of the Society. The Board for Scotland shall consist of not less than four Pharmaceutical Chemists, exclusive of the President and Vice-President of the Society. The Council of the Society may from time to time appoint professors of science to assist either of the Boards of Examiners at any of their examinations. Five members of the Board of Examiners for England and Wales, and three members of the Board of Examiners for Scotland, exclusive in each case of assistant professors, shall constitute a quorum.

4. The Boards of Examiners shall meet for the purpose of conducting examinations at such times during every month

to examine all bills, and to present at the monthly meetings of the Council such as shall have been approved for payment, with the signature of a quorum attached. This Committee shall also prepare a balance sheet for the Auditors previous to the annual meeting.

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2. It shall be the duty of this Committee to superintend the arrangement and preservation of the books, specimens, and apparatus, to inspect the Laboratory, and to make regulations for the admission of visitors and students to the Library, Museum, and Laboratory.

SECTION X.

EXAMINERS—EXAMINATIONS—FEES.

1. The Council of the Society shall appoint the President and the Vice-President of the Society, and such other competent persons as they shall think fit, to be examiners to conduct all such examinations as are provided for or contemplated by the Charter or by the Statute, 1852, and the persons so appointed shall constitute and be called the Board of Examiners for England and Wales. Charter, line 196; Act, sec. viii. ix.

2. The Council of the Society shall appoint fit and proper persons in Scotland to be examiners, and to meet in Edinburgh or Glasgow, or such other place or places as the Council may think desirable, and to conduct there all such examinations as are provided for or contemplated by the Statute, 1852. The President of the Society, if in Scotland, and the Vice-President of the Society, if in Scotland, shall be appointed, and the persons so appointed shall constitute and be called the Board of Examiners for Scotland.

3. The President or the Vice-President of the Society shall preside at all meetings of Boards of Examiners at which they shall be present as Examiners.

4. The Board of Examiners for England and Wales shall consist of not less than six Pharmaceutical Chemists, ex-

as the Council of the Society, at each Monthly Meeting, or at any Special Meeting, shall direct; and such Boards respectively shall report the result of every examination to the Council of the Society at the Monthly Meeting immediately following the same.

5. The Boards of Examiners shall conduct all examinations according to such regulations as shall be made or adopted by them from time to time, and as shall have been approved by the Council of the Society. Such regulations shall from time to time be inserted in the published report of the Transactions of the Society.

6. The Council of the Society shall from time to time supply any vacancy in the office of Examiner, and may remove any member of the Board of Examiners, and substitute another person in his place, and may also from time to time appoint a Special Examiner, or Special Examiners, to conduct any such examination as to knowledge of the Latin language as mentioned in the next following Bye-law.

7. The examinations shall be three in order or number. The first in order shall be an examination as to knowledge of the Latin language. The second in order shall be an examination as to knowledge of subjects connected with Pharmaceutical Chemistry, and shall be called the Minor Examination. The third in order shall be a more extended examination as to knowledge of the last-mentioned subjects, and shall be called the Major Examination.

8. The subjects of the Minor and Major Examinations shall be translation and dispensing of Prescriptions, Pharmacy, General Chemistry, the Chemistry of Poisons, Posology, Materia Medica, and Botany.

9. All persons before registration as Apprentices or Students shall pass an examination as to knowledge of the Latin language, and shall pay a fee of Two Guineas, whereupon they shall be registered under the said Act of Parliament as Apprentices or Students.

10. All persons, before registration as Assistants, shall pass the Minor Examination, and shall pay a fee of three guineas if previously registered as Apprentices or Students, or otherwise a fee of five guineas, whereupon they shall be registered under the said Act of Parliament as Assistants.

11. All persons before registration as

clusive of the President and Vice-President of the Society. The Board of Examiners for Scotland shall consist of not less than four Pharmaceutical Chemists, exclusive of the President and Vice-President of the Society. The Council of the Society may from time to time appoint professors of science to assist either of the Boards of Examiners at any of their examinations. Five members of the Board of Examiners for England and Wales, and three members of the Board of Examiners for Scotland, exclusive in each case of assistant professors, shall constitute a quorum. Charter, line 197.

5. The Council of the Society shall from time to time supply any vacancy in the office of examiner, and may remove any member of the Board of Examiners, and substitute another person in his place, and may also from time to time appoint a Special Examiner, or Special Examiners, to conduct any examination as to knowledge of the Latin language. Act, sec. viii. Act, sec. viii; Charter, line 231.

6. As the Act, 1868, contains a provision that all such persons as have from time to time been appointed to conduct examinations under the Pharmacy Act shall be and are thereby declared to be examiners for the purposes of that Act, provided that no person shall conduct any examination for the purposes of that Act until his appointment has been approved by the Privy Council, the Secretary shall from time to time submit to the Privy Council for approval all appointments of Examiners made by the Council of the Society. Act, 1868 sec. 6.

7. The Boards of Examiners respectively shall meet as often as may be required for the purpose of conducting examinations at such times as the Council of the Society from time to time shall direct; and such Boards respectively shall report the result of every examination to the Council of the Society at the Monthly Meeting immediately following the same. Charter, line 231.

8. The Boards of Examiners shall conduct all examinations according to such regulations as shall be made or adopted by them from time to time, and as shall have been approved by the Council of the Society. Such regulations shall from time to time be inserted in the published report of the Transactions of the Society. Charter, lines 226, 231.

9. All persons who shall tender themselves to the examiners for examination, in accordance with the Charter and the Statute, 1852, shall be examined in their knowledge of the Latin language, in Stat. 185 sec. viii.

Pharmaceutical Chemists shall pass the Major Examination, and shall pay a fee of five guineas if previously registered as Assistants, or otherwise a fee of ten guineas, whereupon they shall be registered under the said Act of Parliament as Pharmaceutical Chemists.

12. No person shall be admitted to the Major Examination who shall not have attained the age of twenty-one years.

English Grammar and Composition, and Arithmetic, which examination shall be called the first examination. Such of the said persons as shall desire Certificates of competent skill and qualification to be engaged or employed as Assistants shall be examined in the first examination, and also in the translation and dispensing of Prescriptions, in Botany, in Materia Medica, in Pharmaceutical and General Chemistry, the Chemistry of Poisons and Posology, which examination shall be called the Minor Examination; and such of the said persons as shall desire Certificates of competent skill and qualification to exercise the business or calling of Pharmaceutical Chemists shall be examined in the Minor Examination, and in more extended knowledge of Botany, Materia Medica, the translation and dispensing of Prescriptions, Pharmacy, General Chemistry, the Chemistry of Poisons and Posology, which examination shall be called the Major Examination.

10. All persons who shall tender themselves to the Examiners for examination under the provisions of the Act, 1868, excepting only those specified in the next following Bye-law, shall be examined in the Minor Examination.

11. All persons entitled to be registered as Chemists and Druggists on passing a modified examination, who shall tender themselves to the Examiners for examination under the provisions of the Act, 1868, shall pass the modified examination, which the Council of the Pharmaceutical Society, with the consent of the Privy Council, have declared to be sufficient evidence of skill and competency to conduct the business of a Chemist and Druggist, as the same is set out in the Schedule hereto, or such other modified examination as may in like manner be declared such sufficient evidence. Act 1868, cl. 4.

12. The Examiners shall grant or refuse to such persons as have tendered themselves for the Minor Examination and the Major Examination respectively, as in their discretion may seem fit, Certificates of competent skill and knowledge and qualification, and such Certificates or duplicates thereof or cards of like purport shall be delivered by the Examiners to the Registrar.

13. All persons before registration as Apprentices or Students shall pass the first examination, and shall pay a fee of Two Guineas, whereupon they shall be registered as Apprentices or Students.

14. All persons desiring registration as Assistants under the Statute, 1852, or as Chemists and Druggists under the Act, 1868, excepting those named in the next following Bye-law, shall pass the Minor Examination, and shall pay fees of Three Guineas if previously registered as Apprentices or Students, or otherwise fees of Five Guineas, whereupon they shall be registered accordingly.

15. All persons entitled to be registered as Chemists and Druggists, on passing a modified examination, and desiring so to be registered, shall pass the modified examination, and shall pay a fee of One Guinea, whereupon they shall be registered accordingly.

16. All persons desiring registration as Pharmaceutical Chemists under the Statute, 1852, shall pass the Major Examination, and shall pay a fee of Five Guineas if previously registered as Assistants, or otherwise a fee of Ten Guineas, whereupon they shall be registered accordingly.

SECTION XI.

REGISTRAR AND REGISTRATIONS.

1. The Registrar shall receive and preserve all cards or tickets issued by the Examiners signifying that examinations have been passed.

2. The Registrar shall from time to time make out and maintain a Register of all persons being respectively Members, Associates, and Apprentices or Students of the Society, and a Register of all persons entitled to be registered under the said Act of Parliament with proper indices of such registers respectively.

3. The names of persons registered as Apprentices or Students of the Society shall, upon their election as Associates, be removed from the Register of Apprentices or Students, and placed upon the Register of Associates.

4. The names of persons registered as Apprentices or Students, or as Associates of the Society shall, upon their election as Members, be removed from the Register of Apprentices or Students, or the Register of Associates, as the case may be, and be placed upon the Register of Members.

5. The names of persons registered as Apprentices or Students under the said Act of Parliament shall, upon their being registered as Assistants, be removed from

SECTION XI.

REGISTRAR AND REGISTRATIONS.

1. The Registrar shall receive and preserve certificates, cards, or tickets issued by the Examiners, signifying that examinations have been passed. Stat. 185 sec. iv.

2. The Registrar shall from time to time make out and maintain a Register of all persons being respectively Members, Associates, and Apprentices or Students of the Society, also a Register of all persons entitled to be registered under the Statute 1852, and also a Register in accordance with the provisions of the Act 1868, of all persons who shall be entitled to be registered under that Act, with proper indices of such Registers respectively. Stat. 185 sec. v. x. Act 1868 sec. x.

3. The names of persons registered as Apprentices or Students of the Society, shall, upon their Registration as Pharmaceutical Chemists, Associates, Assistants, or Chemists and Druggists, be removed from the Register of Apprentices or Students.

4. The names of persons registered as Associates or Assistants shall, upon their registration as Pharmaceutical Chemists, be removed from the Register of Associates, or the Register of Assistants, as the case may be.

5. Persons who have not been examined under the said Statute 1852, who

the Register of Apprentices or Students.

6. The names of persons registered as Apprentices or Students, or as Assistants under the said Act of Parliament shall, upon their registration as Pharmaceutical Chemists, be removed from the Register of Apprentices or Students, or the Register of Assistants, as the case may be.

7. All the said Registers shall be revised annually, and laid before the and nual general meeting of the Society.

8. Persons who have not been examined under the said Act of Parliament who have been registered as Pharmaceutical Chemists by reason of their election as Members of the Society, and who have not paid life subscriptions, shall pay the annual subscription required from Members; and the names of all such Members as last mentioned who fail to pay their annual subscription before the first day of May in any year, shall be omitted from the Register of Pharmaceutical Chemists.

have been registered as Pharmaceutical Chemists by reason of their election as Members of the Society, and who have not paid life subscriptions, shall pay the annual subscription required from Members; and the names of all such Members as last mentioned who fail to pay their annual subscription before the first day of May in any year, shall be omitted from the Register of Pharmaceutical Chemists. Stat. 1852, sec. v. & vi.; Charter, lines 74, 98, 245.

6. The Registrar shall comply with such Orders or Regulations for regulating the Register to be kept under the Act 1868 as may from time to time be made by the Council. Act 1862, sec. ix.

7. All the said Registers shall be revised annually and laid before the Annual General Meeting of the Society. Charter, line 98; Stat. 1852, sec. v.; Act 1868, sec. 10.

8. The Registrar shall, in the month of January in every year, at the expense and for the profit (if any) of the Society, cause to be printed and published and sold a correct Register, as required by the Act 1868, and in so doing shall comply with such rules and regulations as may from time to time be in that behalf made by the Council. Act 1868, sec. 13.

SECTION XII.

TREASURER.

1. It shall be the duty of the Treasurer to receive all monies, to pay such accounts as the Council may order by the signature of six Members of the Council in Council assembled, and to render his account at each monthly meeting.

SECTION XII.

TREASURER.

1. It shall be the duty of the Treasurer to receive all moneys, to pay such accounts as the Council may order by the signature of six Members of the Council in Council assembled, and to render his account at each monthly meeting. Charter, lines 176, 229.

SECTION XIII.

SECRETARY.

1. The Secretary shall have authority over the servants of the establishment, whose wages he shall pay. He shall be in attendance at his office from 9.30 a.m. to 5 p.m. every day, except Saturday, and be present at all meetings of the Council and Committees, General and Special Meetings, and also at the Evening Meetings and Lectures. It shall be his duty to superintend the affairs of the Society under the direction of the Council and Committees. He shall keep the books of the Society in a neat and orderly manner, shall conduct the correspondence, and issue all summonses, take the minutes of all Meetings for business, and read them, and make a report of all mat-

SECTION XIII.

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ters that come under his cognizance for the information of the Council and Committees. He shall consult the President or Vice-President on any business requiring attention, between the various meetings, and be responsible for the safe custody of all the documents and property belonging to the Society which shall be under his control.

2. He shall find security in the sum of £300, and shall receive all subscriptions, fees, and donations, and give a printed receipt for the same, and no other, checking each receipt. He shall every Saturday transact any business of the Society that may be required out of doors, and pay to the Treasurer the amount of monies received by him during the week. He shall receive such a sum in advance for petty cash and servants' wages as the Council may order, and account for the same to the Finance Committee, but shall not out of such sum pay any account exceeding forty shillings. He shall also superintend the transmission of the Transactions.

SECTION XIV.

AUDITORS.

The Auditors shall meet at least one month previous to the Annual Meeting; it shall be their duty to inspect the Accounts of the Society, and the Balance Sheet prepared for them by the Finance Committee, which must be certified and signed by them, and be presented to the Council at their Meeting in May.

SECTION XV.

SUMMONSES.

FOR ALL MEETINGS OF THE COUNCIL, COMMITTEES, OR AUDITORS.

1. Printed summonses shall be issued by the Secretary, with his name attached, and if left at the place of business, or transmitted by post, addressed to the place of business or residence of the person summoned, shall be considered as received.

2. All summonses shall be issued at least three clear days previous to the Meetings, inclusive of the day of issuing the same, except in the case of Special Meetings; and all notices of motion shall be inserted therein, and also notice of such matters as require particular consideration, including the names of persons who are proposed for election as

matters that come under his cognizance for the information of the Council and Committees. He shall consult the President or Vice-President on any business requiring attention, between the various meetings, and be responsible for the safe custody of all the documents and property belonging to the Society which shall be under his control; he shall find security in the sum of £500, and shall receive all subscriptions, fees, and donations, and give a printed receipt for the same, and no other, checking each receipt. He shall every Saturday transact any business of the Society that may be required out of doors, and pay to the Treasurer the amount of moneys received by him during the week. He shall receive such a sum in advance for current expenses as the Council may order, and account for the same to the Finance Committee. He shall also superintend the transmission of the Transactions.

SECTION XIV.

AUDITORS.

1. The Auditors shall meet at least one month previous to the Annual Meeting; it shall be their duty to inspect the Accounts of the Society, and the Balance-Sheet prepared for them by the Finance Committee, which must be certified and signed by them, and be presented to the Council at their Meeting in May. Charter, line 227.

SECTION XV.

SUMMONSES.

FOR ALL MEETINGS OF THE COUNCIL, EXAMINERS, COMMITTEES, OR AUDITORS.

1. Printed summonses shall be issued by the Secretary, with his name attached, and if left at the place of business, or transmitted by post, addressed to the place of business or residence of the person summoned, shall be considered as received. Charter, line 227.

2. All summonses shall be issued at least three clear days previous to the Meetings, inclusive of the day of issuing the same, except in the case of Special Meetings; and all notices of motion shall be inserted therein, and also notice of such matters as require particular consideration.

3. The Secretary shall issue sum-

Honorary or Corresponding Members or Superintendents.

3. The Secretary shall issue summonses, notices, or advertisements convening all Special Council or General Meetings. If for the latter, not less than ten clear days' previous notice shall be given; and such summonses, notices, or advertisements shall contain full notice of the business to be discussed at the Special Meeting.

4. Cards of invitation to the Pharmaceutical Meetings and Evening Lectures shall be issued by the Secretary in the name of the Council, to such persons as the Council may direct; and each Member of the Society may, on application to the Secretary, obtain a card for the admission of a friend, to which his own signature must be attached.

SECTION XVI.

FILLING UP VACANCIES BY DEATH, RESIGNATION, OR REMOVAL.

1. In the event of any vacancy occurring in the office of President, Vice-President, or Treasurer, the Secretary shall report the same, and the cause thereof, in the summons for the next Meeting of the Council, who shall thereupon find and declare such vacancy, and immediately proceed to elect from their remaining number a proper person to fill such vacant office.

2. In the event of any vacancy occurring in the Council or Auditors, or in the several Committees, during the current year, the Secretary shall report such vacancy, and the cause thereof, in the summons for the next Meeting of the Council, at which some Member of the Council, or of the Society, as the case may require, shall be nominated to fill up such vacancy.

3. In the event of a vacancy occurring in the office of Secretary, the President or Vice-President shall appoint some person, *pro tempore*, to fulfil the duty of the office, and in the summons for the next Meeting of the Council the vacancy shall be declared; and some person or persons being proposed and seconded at such meeting, the election shall take place, but shall not be final, unless confirmed at the next Meeting of the Council.

monses, notices, or advertisements convening all Special Council or General Meetings. If for the latter, not less than ten clear days' previous notice shall be given; and such summonses, notices, or advertisements shall contain full notice of the business to be discussed at the Special Meeting. Charter, lines 120, 180.

4. Cards of invitation to the Pharmaceutical Meetings and Evening Lectures shall be issued by the Secretary in the name of the Council, to such persons as the Council may direct; and each member of the Society may, on application to the Secretary, obtain a card for the admission of a friend, to which his own signature must be attached.

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1. In the event of any vacancy occurring in the office of President, Vice-President, or Treasurer, the Secretary shall report the same, and the cause thereof, in the summons for the next Meeting of the Council, who shall thereupon find and declare such vacancy, and immediately proceed to elect from their remaining number a proper person to fill such vacant office. Charter, line 236.

2. In the event of any vacancy occurring in the Council or Auditors, or in the several Committees, during the current year, the Secretary shall report such vacancy and the cause thereof, in the summons for the next Meeting of the Council, at which some Member of the Council, or of the Society, as the case may require, shall be nominated to fill up such vacancy. Charter, lines 155, 236. Act 1868, sec. 18-19.

3. In the event of a vacancy occurring in the office of Registrar or Secretary, the President or Vice-President shall appoint some person, *pro tempore*, to fulfil the duty of the office, and in the summons for the next Meeting of the Council the vacancy shall be declared; and some person or persons being proposed and seconded at such meeting, the election shall take place, but shall not be final, unless confirmed at the next Meeting of the Council. Charter, line 236.

SECTION XVII.

REMOVAL OF OFFICERS AND MEMBERS.

1. Every Member of Council who shall commit any act or acts which appear to the Council derogatory to the honour of his office, shall give an explanation of the same to the Council, on being required so to do, and in default thereof, or if such explanation be unsatisfactory to the Members present, he shall be liable to the censure of the Council, or, if it be deemed expedient, a notice may be given by any Member of the Council for a motion of removal from the Society of the Member so offending, which notice shall be inserted in the summons for the ensuing Meetings of the Council until disposed of, and shall be taken into consideration at the first ensuing Meeting of the Council at which twelve Members thereof shall be present.

2. If any report be made to the Council by a Member of the Society in writing, with his name attached, that another Member has been guilty of any act or conduct which, in the opinion of the Council, is contrary to, or subversive of, the interests of the Society, or a violation of its laws and regulations, the Secretary shall write to the Member so accused for an explanation, and in default of explanation, or if the same be unsatisfactory, two Members of the Council shall be deputed to communicate, personally or by letter, with such Member, and shall report the result to the Council; when any Member of the Council shall, if he think it expedient, give notice of a motion for the removal of such Member from the Society. This notice must be inserted in the summons for the ensuing meetings of the Council until disposed of; and be taken into consideration at the first meeting thereof, at which twelve Members are present.

3. Any Member desiring to retire from the Society, shall send notice thereof to the Secretary in writing, together with the diploma of membership. No Member shall be released from his obligation to pay his annual subscription until such time as the diploma of membership shall have been returned.

SECTION XVIII.

FUNDS AND PROPERTY.

1. The Council of the Society shall

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2. If any report be made to the Council by a Member of the Society in writing, with his name attached, that another Member or any Associate has been guilty of any act or conduct which, in the opinion of the Council, is contrary to, or subversive of, the interests of the Society, or a violation of its laws and regulations, the Secretary shall write to the Member or Associate so accused for an explanation, and in default of explanation, or if the same be unsatisfactory, two Members of the Council shall be deputed to communicate, personally or by letter, with such Member or Associate, and shall report the result to the Council; when any Member of the Council shall, if he think it expedient, give notice of a motion for the removal of such Member or Associate from the Society. This notice must be inserted in the summons for the ensuing meetings of the Council until disposed of; and be taken into consideration at the first meeting thereof, at which twelve Members are present. Charter, lines 165 to 170.

3. Any Member or Associate, Apprentice or Student, desiring to retire from the Society, shall send notice thereof to the Secretary in writing, together with the diploma, if any held, by him. No Member or Associate shall be released from his obligation to pay his annual subscription until such time as the diploma, if any, shall have been returned. Charter, line 245.

SECTION XVIII.

FUNDS AND PROPERTY.

1. The Council of the Society shall Charter,

from time to time cause such part of the funds in the hands of the Treasurer as may not, in their judgment, be required for carrying on the business of the Society, to be invested in Government or real securities in the corporate name of the Society.

2. All property belonging to the Society now held, laid out, or invested by, or in the names of Trustees, and including both the General and the Benevolent Funds, shall be conveyed, assigned, and transferred, so as to become vested in the Society, in its corporate name and capacity.

3. The property and funds of the Society, other than monies from time to time in the hands of the Treasurer or Secretary, shall not be disposed of, or otherwise dealt with, except in pursuance of an order of the Council of the Society, signed by six Members, at the least, in Council assembled.

from time to time cause such part of the funds in the hands of the Treasurer as may not, in their judgment, be required for carrying on the business of the Society, to be invested in Government or real securities in the corporate name of the Society. lines 36 to 65.

2. The property and funds of the Society, other than monies from time to time in the hands of the Treasurer or Secretary, shall not be disposed of, or otherwise dealt with, except in pursuance of an order of the Council of the Society, signed by six Members, at the least, in Council assembled. Charter, lines 212 225.

SECTION XIX.

BENEVOLENT FUND.

1. The Benevolent Fund shall consist of donations and subscriptions towards the particular objects of such Fund, in addition to the sum already invested in respect of the same Fund.

2. Donations in aid of the Benevolent Fund shall be invested in Government or real securities; and no part of the invested capital of such Fund shall be distributed among the recipients of relief.

3. The interest to accrue from the invested portion of the Benevolent Fund, together with annual subscriptions in aid thereof, shall be applicable, at the discretion of the Council, towards the relief of distressed Members or Associates of the Society, and their widows and orphans respectively; and any unapplied surplus shall be annually added to the invested capital of the same Fund.

4. Persons eligible for relief from the Benevolent Fund shall be such necessitous Members or Associates of the Society whose connection with the Society shall be of not less than four years' date, and such widows and orphans of Members or Associates as shall be in necessitous circumstances.

SECTION XIX.

BENEVOLENT FUND.

1. The Benevolent Fund shall consist of donations and subscriptions, and such grants as may from time to time be made by the Council from the General Fund towards the particular objects of such Fund, in addition to the sum already invested in respect of the same Fund. Charter, line 210.

2. Donations in aid of the Benevolent Fund shall be invested in Government or real securities; and no part of the invested capital of such Fund shall be distributed among the recipients of relief. Charter, line 212.

3. The interest accruing from the invested portion of the Benevolent Fund, together with annual subscriptions and grants made from the General Fund in aid thereof, shall be applicable, in the discretion of the Council, towards the relief of persons eligible to receive the same according to the provisions of the Act, 1868, and any unapplied portion of the same in any year may be invested and thenceforward form part of the invested Fund. Act 1868, sec. 22.

SECTION XX.

ANNUAL AND SPECIAL GENERAL MEETINGS.

1. The Council shall prepare a Report of their proceedings during the past year, together with a statement of the funds, which shall be read at the Annual General Meeting, and inserted in the published report of the transactions of the Society.

2. The Council shall meet previous to the General Meeting, and arrange the business to be transacted thereat; and the proceedings of the General Meeting shall be considered perfect in themselves without the necessity of reading or confirming the minutes of the preceding Annual Meeting.

3. No business shall be brought forward at any special General Meeting but that for which it is convened, and of which due notice has been given to the Members of the Society, pursuant to the preceding Bye-law, No. 3, under sec. 15.

SECTION XX.

ANNUAL AND SPECIAL GENERAL MEETINGS.

1. The Council shall prepare a Report of their proceedings during the past year, together with a statement of the funds, which shall be read at the Annual General Meeting, and inserted in the published report of the transactions of the Society. Charter, lines 90 to 100, 113 to 127.

2. The Council shall meet previous to the General Meeting, and arrange the business to be transacted thereat; and the proceedings of the General Meeting shall be considered perfect in themselves without the necessity of reading or confirming the minutes of the preceding Annual Meeting.

3. No business shall be brought forward at any Special General Meeting but that for which it is convened, and of which due notice has been given to the Members of the Society, pursuant to the preceding Bye-law, No. 3, under sec. 15. Charter, line 120.

SECTION XXI.

DIPLOMA AND CERTIFICATES.

1. Every Member of the Society shall, upon payment of his subscription, be entitled to a Diploma of Membership in such form as shall from time to time be determined upon by the Council.

2. Persons registered as Pharmaceutical Chemists under Section 10, 15 & 16 Vict., cap. 56, on being duly elected Members of the Society shall be entitled to a Diploma of Membership stamped with the seal of the Society.

3. All persons examined pursuant to the said Act of Parliament and the foregoing Bye-laws, shall, after having passed their examinations and paid their examination fees, receive certificates in such form as shall from time to time be determined upon by the Council.

4. All plates used from time to time for printing the forms of the said Diploma and Certificates shall be deposited at the house of the Society, in a box having a lock and two keys, one of which shall be in the custody of the President and the other in that of the Vice-President.

5. No print shall be taken from the said plates, or any or either of them, without an express order of the Council.

SECTION XXI.

DIPLOMA AND CERTIFICATES.

1. Every Member of the Society shall be entitled to possess and use a Certificate of Membership. Charter, lines 200, 243.

2. Persons registered as Pharmaceutical Chemists under Section 10 of the Act 1852, shall be entitled to possess and use a Diploma stamped with the seal of the Society. Charter, lines 200, 243.

3. All persons examined, pursuant to the Bye-laws, shall, after having passed their examinations and been registered, receive appropriate Certificates. Stat. 1852, sec. viii.

4. All plates used from time to time for printing the several forms of Diploma and Certificate shall be deposited at the house of the Society, in a box having a lock and two keys, one of which shall be in the custody of the President and the other in that of the Vice-President.

5. No print shall be taken from the said plates, or any or either of them, without an express order of the Council. All prints taken shall be in the custody of the Secretary.

6. Every Diploma and every Certificate of Membership shall be signed by the President and Vice-President, and countersigned by the Secretary or Regis-

All prints taken shall be in the custody of the Secretary, but no print shall be filled up without an express order of the Council, which order, with regard to Certificates, shall from time to time be made, on the receipt of reports from the Board of Examiners.

6. Every Diploma shall be signed by the President and Vice-President, and countersigned by the Secretary. Every Certificate shall be signed by the Board of Examiners, or those members thereof who conducted the examination to which each Certificate relates.

7. Every person ceasing to be a Member of the Society shall forthwith deliver up to such person as the Council shall order the Diploma of Membership furnished to him, pursuant to the preceding Bye-laws.

8. All persons pirating or imitating the Diploma, or any or either of the Certificates, or the Common Seal of the Society, or falsely holding themselves forth to the public by means of advertisements, hand-bills, labels, circulars, or otherwise, as Members of the Society, or registered under the said Act of Parliament, shall be subject to such legal proceedings as the Council shall from time to time order.

SECTION XXII.

JOURNAL AND TRANSACTIONS.

1. The PHARMACEUTICAL JOURNAL (the copyright of which now belongs to the Society) shall be edited, printed, and published in such manner as the Council shall from time to time direct.

2. The Transactions of the Society, required by the preceding Bye-laws to be published, shall be inserted in the said Journal, and all notices or advertisements shall be considered duly made or given if inserted therein.

SECTION XXIII.

PHARMACEUTICAL MEETINGS.

1. Evening Meetings may be held at the house of the Society, as the Council shall from time to time direct, for the reading of papers and discussion of subjects relating to the objects of the Society.

2. Notice of such Meetings shall be given in the PHARMACEUTICAL JOURNAL next preceding.

trar. Every Certificate of Examination shall be signed by the Board of Examiners, or at least five members thereof.

7. Diplomas and Certificates shall be in such form as shall from time to time be determined upon by the Council.

8. Every person ceasing to be a Member of the Society shall forthwith deliver up to such person as the Council shall order the Certificate of Membership furnished to him, pursuant to the preceding Bye-laws.

9. All persons pirating or imitating or improperly using any Diploma, or any or either of the Certificates, or the Common Seal of the Society, or falsely holding themselves forth to the public by means of advertisements, hand-bills, labels, circulars, or otherwise, as Members of the Society, or registered under the Statute, 1852, or Act, 1868, will be subject to legal proceedings and the Council shall from time to time order the same in their discretion. Stat. 185 sec. ii.

SECTION XXII.

JOURNAL AND TRANSACTIONS.

1. The PHARMACEUTICAL JOURNAL (the copyright of which now belongs to the Society) shall be edited, printed, and published in such manner as the Council shall from time to time direct. Charter, line 6.

2. The Transactions of the Society required by the preceding Bye-laws to be published, shall be inserted in the said Journal, and all notices or advertisements shall be considered duly made or given if inserted therein. Charter, line 125.

SECTION XXIII.

PHARMACEUTICAL MEETINGS.

1. Evening Meetings may be held at the house of the Society, as the Council shall from time to time direct, for the reading of papers and discussion of subjects relating to the objects of the Society.

2. Notice of such Meetings shall be given in the PHARMACEUTICAL JOURNAL next preceding.

3. All communications intended to be made at such Meetings shall be submitted to the President, or, in his absence, to the Vice-President, or to the Chairman of the Meeting, for his sanction, and without such sanction no subject shall be introduced.

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SCHEDULE.

THE MODIFIED EXAMINATION FOR ASSISTANTS UNDER THE PHARMACY ACT, 1868.

AS APPROVED BY THE PRIVY COUNCIL.

Candidates will be examined in the following subjects :—

PRESCRIPTIONS.

Candidates will be required to read Autograph Prescriptions, translate them into English, render a correct Translation of the Directions for Use and detect Unusual Doses.

PRACTICAL DISPENSING.

To weigh, measure, and compound Medicines, write the Directions in suitable language, finish and properly direct each Package.

MATERIA MEDICA AND QUALITY OF SPECIMENS.

To recognize the Pharmacopœia Chemicals in frequent demand, and specimens of Roots, Barks, Leaves, Fruits, Resins, and Gums in ordinary use; the following Plants, either in a fresh or dried state, or from plates :—Belladonna, Stramonium, Hyoscyamus, Conium, Aconitum, Digitalis, and Sabina; also to estimate the quality of each specimen submitted and its freedom from adulteration.

PHARMACY.

To recognize the Preparations of the Pharmacopœia which are not of a definite Chemical Nature, such as Extracts, Tinctures, and Powders, and give the proportions of the more active ingredients.

FORM OF BEQUEST.

TO THE GENERAL OR BENEVOLENT FUND.

"*I give and bequeath the sum of* *unto the* PHARMACEUTICAL SOCIETY OF GREAT BRITAIN, *the same to be paid out of my pure personal estate, and to be applied for the purposes of the* GENERAL OR BENEVOLENT FUND *of the said Society.*"

N.B.—Devises of land and bequests of money savouring of realty, or, in other words, connected in any way with land, will be void.

FORM OF BEQUEST.

TO THE GENERAL OR BENEVOLENT FUND.

"*I give and bequeath the sum of* *unto the* PHARMACEUTICAL SOCIETY OF GREAT BRITAIN, *the same to be paid out of my pure personal estate, and to be applied for the purposes of the* GENERAL OR BENEVOLENT FUND *of the said Society.*"

N.B.—Devises of land and bequests of money savouring of realty, or, in other words, connected in any way with land, will be void.

THE "SANDFORD" TESTIMONIAL.

A meeting was held, by permission of the Council of the Pharmaceutical Society, at 17, Bloomsbury Square, on Tuesday evening, the 6th of October, to consider a series of resolutions, passed at the Norwich meeting of the British Pharmaceutical Conference, and published in the September number of the Journal, referring to the singularly important services rendered by the President of the Society in connection with recent pharmaceutical legislation. The very numerous attendance testified to the interest felt in the object of the meeting by all Mr. Sandford's fellow-labourers. Daniel Hanbury, F.R.S., was called upon to preside.

The following resolutions were carried unanimously :—

Moved by Mr. WAUGH, and seconded by Mr. MORSON,—

"That it is eminently desirable that a testimonial be presented to Mr. George Webb Sandford, President of the Pharmaceutical Society, for his able and unremitting services in promoting the passing of the Amended Pharmacy Act."

Moved by Mr. ORRIDGE, and seconded by Mr. HORATIO PASS,—

"That the gentlemen now present do constitute a General Committee for the purpose of carrying out the foregoing resolution, with power to add to their number."

Moved by Mr. S. C. BETTY, and seconded by Mr. H. SUGDEN EVANS,—

"That Mr. Frederick Barron, of the firm of Drew, Barron, and Co., Bush Lane, be requested to act as Chairman of the General Committee."

Moved by Mr. R. REYNOLDS (Leeds), and seconded by Mr. A. F. HASELDEN,—

"That Mr. Benjamin Brogden Orridge be requested to accept the office of Treasurer, and that Mr. ichael Carteighe, Mr. John Mackay (Edinburgh), and Mr. Henry Matthews, be requested to act as Honorary Secretaries."

After some discussion as to what would be the most appropriate form of testimonial, it was agreed to postpone the further consideration of the matter, until the first meeting of the Committee.

The business terminated with a cordial vote of thanks to Mr. Daniel Hanbury, for his able and courteous conduct in the chair,—moved by Mr. T. H. HILLS, and seconded by Mr. HENRY MATTHEWS.

At the meeting of the Committee, on the 13th of October, Mr. Frederick Barron in the chair, it was resolved that the Testimonial should be both *personal* and *commemorative*, and that subscriptions should be at once solicited for the "Sandford" Testimonial Fund.

The following gentlemen have already expressed their willingness to serve on the Committee; and the Secretaries will be glad to receive, as soon as possible, the names of any others who desire to join it:—

Frederick Barron, Bush Lane, E.C., *Chairman.*

B. B. Orridge, 32, Ironmonger Lane, E.C., *Treasurer.*

Abraham, J., Liverpool.
Attfield, J., 17, Bloomsbury Square, W.C.
Atherton, J. H., Nottingham.
Balkwill, A. P., Plymouth.
Barnes, J. B., 1, Trevor Terrace, S.W.
Bartlett, W., 1, Bretten Terrace, Chelsea.
Bell, C., Hull.
Bentley, R., 17, Bloomsbury Square, W.C.
Betty, S. C., 1, Park Street, N.W
Bird, W. L., 42, Castle Street, W.
Bottle, Alex., Dover.
Bourdas, I., 7, Pont Street, S.W..
Brady, H. B., Newcastle-on-Tyne.
Bremridge, E., 17, Bloomsbury Sq., W.C.
Brough, J. C., Kensington, W.
Buckle, C. F., 77, Gray's Inn Road, W.C.
Carteighe, M., 172, New Bond Street, W.
Carter, F. P., 20, Charterhouse Sq., E.C.

Commans, R. D., Bath.
Constance, E., 37, Leadenhall St., E.C.
Cox, H., 44, Strutton Ground, S.W.
D'Aubney, T., Shepherdess Walk, N.
Deane, H., Clapham.
Dymond, G., Birmingham.
Earle, F., Hull.
Edwards, G., Dartford.
Evans, H. S., 60, Bartholomew Close, E.C.
Flux, Wm., East India Avenue, E.C.
Fox, Dr. Tilbury, 40, Sackville Street, W.
Francis, G. B., 5, Coleman Street, E.C.
Groves, T. B., Weymouth.
Gulliver, W., 33, Lower Belgrave Street.
Hanbury, D., Plough Court, E.C.
Haselden, A. F., 18, Conduit Street, W.
Herring, J., 40, Aldersgate Street, E.C.
Hills, T. H., 338, Oxford Street.
Hornby, E. P., Sheffield.
Howden, R., 78, Gracechurch Street, E.C.
Ince, J., 26, St. George's Place, S.W.
Jacks, E., 161, Gower Street, W.C.
Lockyer, G., Deptford, S.E.
Lord, C., Todmorden.
Mackay, J., Edinburgh.
Matthews, C., Ashby-de-la-Zouch.
Matthews, H., 60, Gower Street, W.C.
Matthews, W., 1, Wigmore Street, W.
Medlock, H., 22, Tavistock Square, W.C.
Morson, T. N. R., 38, Queen Square, W.C.
Palk, E., Southampton.
Pass, H., Wandsworth Road, S.
Pedler, G., 199, Fleet Street, E.C.
Proctor, B., Newcastle-on-Tyne.
Randall, W. B., Southampton.
Redwood, T., 39, Russell Square, W.C.
Reynolds, R., Leeds.
Robbins, J., 372, Oxford Street, W.
Sanger, W. A., 150, Oxford Street, W.
Savage, W. D., Brighton.
Savory, Charles, 143, New Bond St., W.
Shepheard, T., Chester.
Spurrell, Dr. F., Belvedere, S.E.
Squire, P., 277, Oxford Street, W.
Standring, T., Manchester.
Stoddart, W. W., Bristol.
Tibbs, F., 47, Blackfriars Road, S.E.
Umney, C., 40, Aldersgate Street, E.C.
Vizer, E., 63, Lupus Street, S.W.
Wade, J., 174, Warwick Street, S.W.
Warner, R., 20, Charterhouse Square, E.C.
Watson, T., 18A, Basinghall Street, E.C.
Waugh, G., 177, Regent Street, W.
Williams, J., 5, New Cavendish Street, W.
Wright, G. H., 7, Poultry, E.C.
Wright, W. V., Southwark Street, S.E.

With power to add to their number.

The following circular has been issued :—

"THE 'SANDFORD' TESTIMONIAL FUND.

"Dear Sir,—At a numerously attended meeting of Chemists and others, representing various sections of the trade, held at 17, Bloomsbury Square, London, on the 6th of October, the following resolution was carried unanimously :—'That it is eminently desirable that a Testimonial be presented to Mr. George Webb Sandford, President of the Pharmaceutical Society, for his able and unremitting services in promoting the passing of the amended Pharmacy Act.'

"At the meeting of the British Pharmaceutical Conference at Norwich, in August last, a similar resolution was passed, and numerous expressions of approval have been received from various parts of the country.

"The Committee has decided that the Testimonial shall be both personal and commemorative,—*personal* in the shape of a gift to Mr. Sandford, and *commemorative* in the form of a portrait or bust to adorn the rooms of the Pharmaceutical Society.

"As a considerable sum will be required for this purpose, we shall be pleased to receive, on behalf of the Committee, any amount that you may think proper to contribute, and to place your name on the General Committee.

"Subscriptions may be forwarded by cheque, post-office order, or stamps, to the Treasurer, Mr. B. B. Orridge, 32, Ironmonger Lane, London, E.C., to any member of the Committee, or to the Honorary Secretaries. A list of the subscribers will be published periodically in the 'Pharmaceutical Journal' and 'Chemist and Druggist.'

"We are, dear Sir, yours faithfully,

"MICHAEL CARTEIGHE, 172, New Bond St., London, W.,
"JOHN MACKAY, 119, George Street, Edinburgh,
"HENRY MATTHEWS, 60, Gower Street, London, W.C.,
Hon. Secs.

"N.B.—Post-Office Orders should be made payable at the Chief Office, to the Treasurer, Mr. B. B. Orridge."

PRELIMINARY LIST OF SUBSCRIPTIONS.

	£	s.	d.
Ackerman, T., Bristol	0	5	0
Alder, T. S., Newcastle	0	5	0
Allman, J. D., 47, Blackfriars Road	0	2	6
Anderson, C., London	1	1	0
Applegate, E., Upper Holloway	0	10	6
Attfield, J., 17, Blomsbury Sq.	1	1	0
Baiss Bros. and Co., 102, Leadcnhall Street	2	2	0
Baissac, E. J. D., 17, Blooms-bury Sqnare, W.C.	0	2	6
Balkwill, A. P., Plymouth	1	1	0
Barnard, John, 338, Oxford St.	1	1	0
Bartlett, W., Chelsea	1	1	0
Barron, Harveys, and Co., 1, Giltspur Street, E.C.	2	2	0
Battley and Watts, 32, Lower Whitecross Street, E.C	2	2	0
Beadel, Alfred, Newcastle	1	1	0
Beddard, J., London	0	10	0
Beere, L. E., Blackwall	0	5	0
Bell, J., and Co., 338, Oxford Street	2	2	0
Bell, James, Newcastle	0	5	0
Bell, C. B., Hull	1	1	0
Bellerby, Mr., Newcastle	0	5	0
Bentley, R., 17, Bloomsbury Sq.	1	1	0
Betty, S. C., 1, Park St., N.W.	1	1	0
Bilney, J. T., 63, Lupus St.	0	2	6
Binge, J., London	0	10	6
Birch, H. C., London	0	10	0
Bird, Augustus, Shepherd's Bush	1	1	0
Bird, W. L., 42, Castle St., W.	1	1	0
Blackwell, F., 17, Bloomsbury Square, W.C.	0	2	6
Blain, William, Bolton	1	1	0
Boe, James, Newcastle	0	5	0
Bottle, Alexander, Dover	1	1	0
Bourdas, Isaiah, 7, Pont Street	1	1	0
Bourdas, Isaiah, jun., 7, Pont Street, S.W.	1	1	0
Bourdas, Jno., 7, Pont St., S.W.	1	1	0
Brady, Alfred, Newcastle	1	1	0
Brady, H. B., Newcastle	1	1	0
Bremridge, Elias, 17, Blooms-bury Square, W.C.	1	1	0
Bremridge, Richard, 17, Blooms-bury Square, W.C.	0	10	6
Brockett, Mr., Newcastle	0	5	0
Brough, J. C., Kensington	0	10	6
Brown, H., 40, Aldersgate St.	0	10	6
Bryant, J., 338, Oxford St., W.	0	5	0
Buckle, C. F., 77, Gray's Inn Road, W.C.	1	1	0
Burgoyne, Burbidges, and Squire, 16, Coleman St., E.C.	2	2	0
Cadman, D. W., 17, Blooms-bury Square, W.C.	0	2	6
Calvert, R., 17, Bloomsbury Sq.	0	2	6
Carteighe, Michael, 172, New Bond Street, W.	1	1	0
Chard, F. J., London	0	10	6
'Chemist and Druggist,' the Proprietors of	2	2	0
Clarke, J. T., 17, Bloomsbury Square, W.C.	0	2	6
Clay and Abraham, Liverpool	2	2	0
Coates, J. M., Newcastle	0	10	0
Cocksedge, H. B., 20, Bucklers-bury, E.C.	0	10	6
Collins and Roper, Bristol	0	10	6
Commans, R. D., Bath	1	1	0
Constance, Edward, 37, Leaden-hall Street, E.C.	1	1	0
Cooper, Albert	0	10	6
Cox, H., 44, Strutton Ground	1	1	0
Cracknell, C., Edgware Road	1	1	0
Crossby, R. S., 17, Blooms-bury Square, W.C.	0	5	0
Crozier, S., Newcastle	0	5	0
Currie and Hutchinson, New-castle	0	10	0
Dallas, C., 7, Pont St., S.W.	0	5	0
Darby, S., 140, Leadenhall St.	1	1	0
D'Aubney, T., 82, Shepherdess Walk, N.	1	1	0
Davy, Yates, and Routledge, Thames Street, E.C.	2	2	0
Dawnic, H., and Co., New-castle	0	10	0
Dawson, O. R., Southampton	1	1	0
Dean, E., Newcastle	0	5	0
Deane, Henry, Clapham, S.	1	1	0
Dewar, Mr., Newcastle	0	5	0
Dinneford and Co., 172, New Bond Street, W.	2	2	0
Dobson, J., Newcastle	1	1	0
Doughty, M., 26, Blackfriars Road, S.E.	0	10	6
Dowman, G., Southampton	0	10	6
Drew, Barron, and Co., Bnsh Lane, E.C.	2	2	0
Drew and Alexander, 91, Black-man Street, S.E.	0	10	6
Edwards, George, Dartford	1	1	0
Elliott, R., Gatcshead	0	10	0
Elvey, T., 8, Halkin St. West	1	1	0
Evans, Lescher, and Evans, Bartholomew Close	2	2	0
Evans, H. Sugden, Bartholo-mew Close	1	1	0
Evans, Sons, and Co., Liverpool	2	2	0

	£	s.	d.
Ferris and Co., Bristol	1	1	0
Fisher and Haselden, 18, Conduit Street, W.	2	2	0
Flux, Argles, and Rawlins, East India Avenue, E.C.	2	2	0
Foot, R. R., London	0	5	0
Foster, M., 196, Bishopsgate St.	0	10	6
Franklin, A., 17, Bloomsbury Square, W.C.	0	5	0
Freestone, T. M., Bristol	0	5	0
Gale, S., 338, Oxford St., W.	1	1	0
Garbutt, C. D., Gateshead	0	5	0
Garle, Jno., Bromley	1	1	0
Goodwin, F., 17, Bloomsbury Square, W.C.	0	2	6
Gordelier, J. T., Sittingbourne	0	2	6
Gordelier, P. W., Sittingbourne	0	5	0
Gosden, H., 140, Leadenhall Street, E.C.	1	1	0
Gowland, M. E., Newcastle	0	5	0
Groves, T. B., Weymouth	1	1	0
Gulliver, William, 33, Lower Belgrave Street, S.W.	1	1	0
Gunn, J., Hambledon	0	5	0
Haddock, G. J., 338, Oxford Street, W.	0	10	6
Hall, A., 338, Oxford St., W.	0	5	0
Hall, T., Newcastle	0	5	0
Hall, T. Howard	1	1	0
Hanbury, Daniel, Plough Ct.	1	1	0
Hardy, S. C., 338, Oxford St.	0	5	0
Hart, Alfred, London	0	5	0
Haselden, A. F., 18, Conduit Street, W.	1	1	0
Hatch, R. M., and Co., Bristol	0	10	6
Hearon, Squire, and Francis, 5, Coleman Street, E.C.	2	2	0
Herrings and Co., 40, Aldersgate Street, E.C.	2	2	0
Hicking, J., 17, Bloomsbury Sq.	0	2	6
Hills, T. Hyde, 338, Oxford St.	1	1	0
Hinton, H. A., London	0	10	0
Hodgkinson, King, and Co., Tenter Street, E.C.	2	2	0
Hodgkinsons, Stead, and Treacher, 127, Aldersgate Street, E.C.	2	2	0
Holmes, W., 338, Oxford St.	0	5	0
Hooking, M., Southampton	0	10	6
Hopkin and Williams, 5, New Cavendish Street, W.	2	2	0
Hornby, E. P., Sheffield	1	1	0
Horncastle, J., Conduit Street, Bayswater, W.	0	10	6
Horner and Sons, Bucklersbury	2	2	0
Howden, Robert, 78, Gracechurch Street, E.C.	1	1	0
Hubbard, J., 118, London Rd.	0	5	0
Hudson, J. W., Middlesborough	0	10	6
Hume, Alfred, Newcastle	0	7	6
Hunt, J., 24, Exmouth St. W.C.	0	10	6
Hunter, J. W., Gateshead	0	5	0
Ince, Joseph, 26, St. George's Place, S.W.	1	1	0
Ingham, J., 17, Bloomsbury Sq.	0	2	6
Iredale, G., 17, Bloomsbury Sq.	0	2	6
Ismay, J., and Son, Newcastle	2	2	0
Jacks, E., 161, Gower Street	1	1	0
Jackson, W. T., 213, Union St.	0	10	6
Jobson, R., Newcastle	0	5	0
Johnson, E. E., 338, Oxford St.	0	5	0
Kendal, J. H., Gateshead	0	5	0
Kent, H. R., 338, Oxford St.	0	5	0
Kent, T., 226, Blackfriars Rd.	0	10	6
Kennedy, A., Newcastle	0	5	0
King, H., London	0	10	0
Kinsey, E. H., London	0	5	0
Kneen, G. F., 7, Pont St., S.W.	0	5	0
Lacy, B. W., London	0	10	0
Lacey, Walter, Bristol	0	5	0
Litten, H., Sittingbourne	0	2	6
Macann, F., 17, Bloomsbury Sq.	0	1	0
Mackay, John, Edinburgh	1	1	0
Mackmurdo, W. G., 17, Bloomsbury Square, W.C.	0	10	6
Maitland, J., 10, Chester Pl.	1	1	0
Malden, W. W., Brompton Rd.	1	1	0
Marley, W., Newcastle	0	5	0
Marshall, George, Newcastle	0	2	6
Martin, F., Bristol	0	5	0
Martindale, W., University College Hospital	0	5	0
Matthews, Henry, 60, Gower St.	1	1	0
Matthews, Charles, Ashby-de-la-Zouch	0	10	6
Maw and Son, Aldersgate St.	2	2	0
Mawson and Swan, Newcastle	2	2	0
Medlock, H., 22, Tavistock Sq.	1	1	0
Meggeson and Co., Cannon St.	2	2	0
Mellin, J. P., Wimbledon	1	1	0
Middleton, F., 338, Oxford St.	1	1	0
Miller, Charles S.	0	2	6
M'Leod, H., Newcastle	0	5	0
Moody, George, Newcastle	0	5	0
Morson, Thomas, and Son, Southampton Row, W.C.	2	2	0
Moss, J., 17, Bloomsbury Sq.	0	5	0
Mundy, A. O., 40, Aldersgate Street, E.C.	0	10	6
Newton, Mr., Newcastle	0	5	0

	£	s.	d.
Orridge, B. B., 32, Ironmonger Lane, E.C.	2	2	0
Owen, W., Newcastle	0	10	6
Page and Tibbs, 47, Blackfriars Road, S.E.	1	1	0
Palk, E., Southampton	1	1	0
Parker, J. D., 40, Aldersgate Street, E.C.	0	10	6
Parker, M., Newcastle	0	5	0
Parnell, G. W., London	0	10	0
Pass, Horatio, Wandsworth Rd.	1	1	0
Patts, Thomas, Newcastle	0	5	0
Pedler, G. S., 199, Fleet Street	1	1	0
Pitman, J., Bristol	0	5	0
Porter, J. T., 338, Oxford St.	0	5	0
Preston and Sons, Leadenhall Street, E.C.	2	2	0
Proctor, John, Newcastle	0	5	0
Proctor, B., Newcastle	1	1	0
Pufford, W. H., 338, Oxford St.	0	5	0
Randall, W. B., Southampton.	1	1	0
Redwood, T., 17, Bloomsbury Square, W.C.	1	1	0
Reeler, J. W., 39, Russell Sq., W.C.	0	2	6
Reynolds, Richard, Leeds	1	1	0
Robeson, C. B., 17, Bloomsbury Square, W.C.	0	2	6
Robbins, J., 372, Oxford St., W.	1	1	0
Rooke, E., Sittingbourne	0	2	6
Ross, F., 17, Bloomsbury Sq.	0	5	0
Rowell, R. H., Newcastle	0	5	0
Sainsbury, E., 17, Bloomsbury Square, W.C.	0	5	0
Sanger, W. A., 150, Oxford St.	2	2	0
Savage, W. D., Brighton	1	1	0
Savory, Charles, 143, New Bond Street	1	1	0
Savory and Moore, 143, New Bond Street	2	2	0
Schacht, G. F., Clifton	0	10	0
Shepheard, T., Chester	1	1	0
Sircom, R., Bristol	0	5	0
Smallman, E. B., 17, Bloomsbury Square, W.C.	0	2	6
Spurrell, Dr. Flaxman, Belvedere, S.E.	1	1	0
Squire, A. H., 17, Bloomsbury, Square, W.C.	0	10	6
Squire, P., 277, Oxford Street	1	1	0
Standring, Thomas, and Son, Manchester	2	2	0
Stocks, C., 17, Bloomsbury Sq.	0	5	0
Stoddart, W. W., Bristol	1	1	0
Stork, J. S., Newcastle	0	5	0
S. F. S.	0	5	0
Temperley, T., Newcastle	0	5	0
Tibbs, Frederick, 47, Blackfriars Road, S.E.	1	1	0
Tilden, W. A., 17, Bloomsbury Square, W.C.	0	10	6
Tippett, B. M., Sloane Street.	0	10	6
Toogood, W., 37, Mount St.	1	1	0
Townshend, C., 40, Aldersgate Street, E.C.	1	1	0
Trooke, R. J., Bristol	0	5	0
Turner, C. H., Great Russell Street, W.C.	0	10	6
Umney, C., 40, Aldersgate St.	0	10	6
Vizer, E. B., Lupus St., S.W.	1	1	0
Wade, J., 174, Warwick St.	1	1	0
Walton, J., 17, Bloomsbury Sq.	0	2	6
Wallis, J. T., 338, Oxford St.	0	5	0
Warboys and Son, 76, New Cut	1	1	0
Ward, F., London	0	10	6
Warner, Carter, and Co., 20, Charterhouse Square, E.C.	2	2	0
Warren, A. and J., Bristol	0	10	6
Waters, C. W., Newcastle.	0	2	6
Watson, T. E., Newcastle	0	5	0
Watson, Thomas D., 18A, Basinghall Street, E.C.	1	1	0
Waugh, G., 177, Regent St.	1	1	0
Webb, E. A., 17, Bloomsbury Square, W.C.	0	2	6
Welch, T., Newcastle.	0	10	6
Wells, T., London	0	10	6
Wigg, H. J., 338, Oxford St.	1	1	0
Wilkinson, J., 17, Bloomsbury Square, W.C.	0	2	6
Wilkinson, Benjamin J.	0	2	6
Wilson, T., Upper Holloway.	0	10	6
Wretts, J. R., 338, Oxford St.	0	5	0
Wright, W.V., and Co., Southwark Street, S.E.	2	2	0
Wyley, W. F., 17, Bloomsbury Square, W.C.	0	10	6

* A large number of additional names has been received since the above has been in type; a further list will be published in the next Journal.

PROVINCIAL TRANSACTIONS.

LIVERPOOL CHEMISTS' ASSOCIATION.

Annual Meeting, held at the Royal Institution, October 1, 1868. The President, Mr. R. Sumner, in the chair.

The following gentlemen were elected Members:—Mr. Thomas Gawith, 47, Lime Street; Mr. N. S. Cohen, 56, Hanover Street; Mr. J. Doughty, 11, King Street, Chester; Mr. J. E. Parker, 56, Hanover Street. Mr. R. M. Sumner was elected an Associate.

Donations to the Library, during the recess, of the Pharmaceutical Journal, the Chemist and Druggist, the New York Druggist Circular, Report of the Alumni Association of Philadelphia, and Proceedings of the Liverpool Polytechnic Society, were announced, and thanks voted to the donors.

A portrait of Mr. H. S. Evans, presented by him to the Association, was exhibited, and thanks voted to him for the gift.

The SECRETARY then read the Annual Report:—

The review of the proceedings of the past Session, which your Council annually lays before you, in some years presents no marked variation from the ordinary course of the Association's progress; whilst in others it records some decided advance, either in the means of usefulness provided, or in the success which has attended them. During the nineteenth Session of the Liverpool Chemists' Association an event has happened of the highest importance to many of its members, and your Council trusts that its efforts have been commensurate with the responsibility which has fallen upon it.

In many respects the past Session has been one on which your Council looks back with pleasure. There has been an addition to our numbers of nineteen Members and eight Associates during the year; twenty-one have resigned, removed, or died, leaving a hundred and thirty-eight on the books at present.

The papers read during the Session have brought before you many of the important questions of the day. The blending of scientific chemistry with practical questions of pharmacy has characterized them, and with the miscellaneous meetings, in which much mutual interchange of information and friendly discussion have taken place, the results of the Session, in this respect, will compare favourably with those of any former one. Your Council would, however, call the attention of members to the fact that the burden of supplying papers has been suffered to fall upon a very few, and it would invite the contribution of short papers by those who do not wish to occupy an entire evening.

In the Report of last year, attention was called to the unsatisfactory state of the Museum. Your Council has not neglected the matter, and the Library and Museum Committee has commenced the rearrangement with a special view to the illustration of the Materia Medica of the Pharmacopœia. Already the officinal articles have been separated from the non-officinal, and the former arranged in alphabetical order. Much remains to be done, and before even a passable representation of the Materia Medica can be made, many gaps must be filled up. Your Council hopes that as the deficiencies in the Museum can now be readily ascertained, the Members will endeavour to supply them.

The Library has been well used by the members; three hundred and forty books having been taken out during the past Session, an increase of forty on the previous one.

The educational efforts of the Association have not been without fruit, although your Council would have rejoiced to see greater appreciation of the means of instruction afforded. During the last Session arrangements were made with the Honorary Secretary, Mr. E. Davies, for the delivery of a course of lectures on Chemistry, free to the Members, and your Council has had much satisfaction in the result. The lectures have been of high character and ably illustrated, and your Council has much pleasure in announcing that they will be continued during the next Session. The Practical Chemistry class was composed of only three students.

The question of pharmaceutical education has now assumed an importance which it did not previously possess. All who intend to make Pharmacy their business, must obtain the necessary qualifications, and while your Council feels the responsibilities thrown

upon it to furnish the appliances which so large a town as this ought to possess for the obtaining a complete acquaintance with the various branches of knowledge required for passing the examinations under the Pharmacy Act, it would urge the importance of an earnest use of these means by all those whose future depends so greatly upon their present exertions.

In the School of Pharmacy your Council announce with much pleasure that it has provided classes of Chemistry, Materia Medica, and Botany, to be conducted by Mr. E. Davies and Dr. Carter, whose attainments and ability in teaching give an assurance of the greatest efficiency.

The present year will form an era in the history of practical Pharmacy in this country. In the year 1853 the first Pharmacy Act was passed, and by it the Pharmaceutical Society was empowered to examine applicants and to confer the honorary title of "Pharmaceutical Chemist." Now, the Act has been extended, and the Pharmaceutical Society is authorized to register all existing Chemists and Druggists, and to examine all those who in future wish to assume the name or exercise the functions of Chemists or Druggists. The Act must exercise an important influence on this Society, so large a proportion of its members following the practice of Pharmacy as a profession.

In connection with the other learned societies of the town, your Association sent delegates to Norwich to invite the British Association, with its companion, the Pharmaceutical Conference, to pay a visit to this town. Although other claims have been admitted to be of greater weight as regards 1869, it appears very probable that we shall have the honour of welcoming these Associations at no distant date.

From the Treasurer's Report it appears that there is a balance to the credit of the Association of £8 15*s.* 10*d.*

The following members of Council retire by rotation, and are eligible for re-election —Messrs. Abraham, Redford, Shaw, and Sumner.

The Liverpool Chemists' Association in Account with John Shaw, Treasurer.
Session 1867–68. *Year ending October* 1, 1868.

Dr.

	£	*s.*	*d.*
To Balance from 1867	6	5	5
,, Forty-four Members' Subscriptions	57	0	0
,, Seven Members' Subscriptions Arrears	3	10	0
,, Twelve Associates' Subscriptions	3	0	0
,, Fee to Chemical Lectures	0	5	0
,, Cash received from Treasurer of Gallery of Inventions and Science	2	10	0
,, Fines and Microscopic Fees	0	7	8
	£72	18	1

Cr.

	£	*s.*	*d.*
By Rent	10	10	0
,, Tea, Coffee, and Attendance	15	18	10
,, Insurance	1	6	0
,, Books and Periodicals	6	1	8
,, Printing and Stationery	12	3	6
,, Printing and delivering Circulars	4	16	0
,, Collector's Commission	1	18	9
,, Mr. Davies for Lectures	5	5	0
,, Librarian	4	0	0
,, Secretary's Expenses	2	2	6
Balance in hand	8	15	10
	£72	18	1

Examined and found correct,
JOSEPH ROBINSON,
ALFRED REDFORD, } *Auditors.*

Mr. Sumner proposed "That the Reports as read be adopted, and, together with the Transactions of the General Meetings, the Laws and Bye-laws, the Catalogue of the Books in the Library, and the List of Members, be printed and circulated among the members."

He considered that the reports were of a very encouraging character, especially in reference to the large increase of Associates, and hoped that the additional means of instruction provided would induce young men to join the Association.

The motion was seconded by Mr. Hilditch.

Mr. Shaw moved an amendment to omit the catalogue and laws. He contended that it was not necessary to publish them every year, as a short list of the books added during the Session could be given.

Mr. Betts seconded the amendment, suggesting that the catalogue be printed separately and a small charge made for it.

After some discussion, Mr. Robinson proposed "That the Report as read be adopted,

and that the question of printing the laws and bye-laws and the catalogue be left to the decision of the Council."

Mr. WILSON seconded the motion, which was carried unanimously.

Mr. OCKLESHAW moved, "That the best thanks of this meeting be given to the officers and Council for their valuable services during the Session."

Mr. FRAZER seconded the motion, which was carried unanimously.

Mr. ROBINSON moved "That a vote of thanks be given to the donors to the Library and Museum, and to the authors of papers during the past Session."

Mr. T. F. ABRAHAM seconded the motion, which was carried unanimously.

Mr. REDFORD proposed a vote of thanks to the President for his admirable conduct in the chair, both at that meeting and also during the two years of his presidency. He spoke of the assiduity and earnestness displayed by Mr. Sumner in the highest terms, and particularly of the interest which he took in all which conduced to the education of young men in pharmaceutical knowledge.

The vote was at once carried by acclamation.

The PRESIDENT responded in a few feeling remarks, thanking the members for their kindness, and expressing the full reward which he experienced in seeing the unity which exists in the Association.

PLYMOUTH ASSOCIATION OF CHEMISTS AND DRUGGISTS.

The Association of Chemists and Druggists for Plymouth, Devonport, Stonehouse, and neighbourhood, was auspiciously inaugurated October 21, at the Athenæum, Plymouth, when a conversazione was held, attended by a large assembly, in which the professional interest, as well as the lay element, was influentially represented. The association has been called into existence by the passing, during the last session of Parliament, of "The Pharmacy Act" (Vic. 31, cap. 120), which was better known as "The Sale of Poisons Bill." This Act provides, among other things, that in future, before any persons can dispense poisons, they shall have shown themselves qualified to do so by passing an examination, and this association is formed, in order that papers may be read from time to time with a view to the improvement of the status of the proprietary members, and also to provide means for the education of assistants and apprentices that they may pass the required examination. There are at present about eighty members enrolled. Mr. I. C. Radford has been elected President, Mr. A. P. Balkwill, Vice-President, Mr. F. Herron, Treasurer, and Mr. G. Breeze, Secretary, and already a list of monthly lectures has been arranged for during the session. The conversazione was in every respect a success. The members for Plymouth, Sir R. P. Collier and Mr. W. Morrison, were among those present. Around the room were arranged a large number of articles of great interest to the profession, including the following:—A good collection of specimens of drugs and chemicals, from Drew, Barron, and Company; furnaces, retorts, crucibles, and other chemical apparatus, by Doulton and Watts; gluten, bread, and biscuits, malt extract, patent food, etc., by Mr. Van Abbott; a very superior collection of alkaloids and metallic salts, by Mr. Marten, Bristol; anæsthetic apparatus, galvanic machine, inhalers, spinal ice bags, etc., by Maw and Son; a superior collection of pharmaceutical preparations, by Hearon, Squires, and Francis; some very beautiful crystals of oxalate of chromium, borotartrate of potash, etc. etc., by Davy, Yates, and Co., Edinburgh; model in cork of St. George and the Dragon, by Mr. Gibson; case of composition photographs, by Mr. E. Lee; rare specimens of Dresden and Oriental china, Japanese cabinet, soap stone carvings, etc. etc., by Mr. J. Allen; splendid cases of birds, models, carvings, etc., by Mr. J. Gatcombe; Chinese paintings (illustrative of opium eating), by Messrs. Morson and Son, London; case of beetles, butterflies, etc., by Mr. Branson; cut glass bottles of perfume, by Mr. Breeze; perfumes and paper flowers, by Mr. C. Hill; framed case of new poison labels, etc., by Mr. H. Silverlock; some very elegant crystals of bismuth, bismuth ore, by Mr. Schacht, Clifton; crystals of chemical salts, by Mr. Sloggett; perfume vaporizer, perfume fountain, etc., by Mr. E. Rimmel; magnificent mass of crystal bichromate of potash, metrical weights and measures, chemical specimens, etc., by Mr. Balkwill; aniline dye crystals, by Mr. F. Dickerson; specimens of algæ, by Mr. Bosworva; model of steam-engine, by Mr. Branson; Japanese and Chinese

curiosities, by Mr. Filmer; coloured life-size portraits and other photographs, etc., by Messrs. Heath, May, Palmer, and Duprez; and specimens of British mosses (mounted), by Mr. E. Holmes; chemical apparatus, by Mr. James How.

The inaugural address delivered during the course of the evening by the President was of a very suitable nature. Mr. Radford, after explaining the absence of the member for Devonport, and that members of the medical profession of the neighbourhood were absent in consequence of an important meeting of the Plymouth Medical Society, proceeded with his address. He regretted that the society had not been formed many years since, for then they would have been in a position to look back on great results. He next referred to the efforts made in Parliament, a quarter of a century back, to introduce Bills which would have been prejudicial to the interest of chemists and druggists, by imposing on them unnecessary restrictions. Reference was also made to the excellent work done by the Pharmaceutical Society, and honourable mention was made of the services of the late Jacob Bell and of Mr. Allen. The last session of Parliament gave them a Bill which conferred great and important privileges on chemists and druggists, and required from them the right performance of most responsible duties. Allusion was made to the work done by living and departed chemists from the West, and to the services of Mr. S. Cave, the member who assisted in carrying the Bill through Parliament, who was also a chemist. The president then explained that the society, now inaugurated, had for its object the holding of periodical lectures and discussions, together with such general arrangements as might be necessary for the instruction of assistants and apprentices, and for this purpose classes had been, or were about to be formed in Plymouth and Devonport. He trusted that in course of time they might get a building of their own, and furnish a museum of pharmacy worthy of this great naval and commercial centre. It had been suggested that they should take advantage of the proposal made to establish new botanical gardens, and secure a site where they might establish a green- and hot-house for the growth of medicinal plants. If they could do this, they would be in a position to invite the Pharmaceutical Conference into the neighbourhood. In conclusion, the President enjoined on the students the importance of application to study, and counselled the members to keep out of the society all party feeling.

Mr. F. P. Balkwill moved a vote of thanks to the President for his address in eulogistic terms, and spoke of the great and further benefits that he believed would be reaped by the continued study of chemistry.

Mr. Allen seconded the vote, and, on its being put to the meeting by Mr. A. P. Balkwill, it was carried with acclamation.

Mr. F. Herron moved a vote of thanks to those members of the House of Commons who assisted in passing the new Pharmacy Act through Parliament, and spoke highly of the service rendered by the members for Plymouth, who were present at every division.

Mr. Breeze seconded the motion, which was carried.

Sir Robert Collier acknowledged with many thanks the kind resolution which had been passed. What the President said was quite true; they had had a very hard fight, for the Bill was met by a violent and a persistent opposition, founded too on grounds apparently plausible. It was declared to be a contravention of free trade; that it sought to set up an odious and an invidious monopoly; and arguments were advanced by speakers of no less eminence than Mr. Lowe and others. He was in favour of free trade, but every rule had its exception, and he was opposed to free trade in poisons. It appeared to him that if there was an exception to free trade it was where they were dealing with such delicate and complicated machinery as the human body, and they ought not to allow an unlimited competition to treat its ailments. They must restrict it to persons whose skill and knowledge were known by a competent examination. On these grounds he felt justified in supporting the Bill. He moreover supported the Bill because the unanimous opinion of the profession was in its favour, and he agreed with Mr. Balkwill that pharmacy was not a trade, but a highly scientific profession.

Mr. Morrison observed that it was always gratifying to public men to find that their labours for the good of society had been appreciated, because the appreciation was somewhat rare. During the seven years he had been in Parliament he knew of no Bill, except it was the Reform Bill, that the House got rid of with greater feelings of relief than the New Pharmacy Act. As a Government Bill it came on for discussion

on nights when other business was transacted, and as they spent an unlimited amount of time in talk last session the Bill generally came on at two o'clock in the morning, and was generally counted out. He felt glad when it was got rid of in a manner that was satisfactory to the profession, and that would recommend itself to the good judgment of the people. After contending that the profession of chemists and druggists should be an exception to the principles of free trade, he stated that it was a fact that of late years poisons had come more and more in vogue as instruments of healing. Therefore it was all the more important that means should be taken to prevent their being dispensed by persons ignorant of their nature. Much good, too, he anticipated would result from the operation of the Act in leading to a greater knowledge of chemistry. In towns the application of the Act was easy enough, but he was afraid that in villages it would result in the stopping of the sale of poisons. Experience, however, would show whether modification would be required.

On the motion of Mr. A. P. Balkwill, seconded by Mr. Turney, thanks were accorded to the visitors, and Dr. Hingston, Dr. Row, and Mr. J. W. W. Ryder acknowledged it.

Thanks were also given, on the motion of Mr. S. Hill and Mr. Dampney, to those who had contributed articles of interest to the conversazione.

Mr. Down (Torpoint) proposed a vote of thanks to the gentlemen who had lent microscopes, and Mr. Dansey replied to it.

The conversazione was shortly afterwards brought to a conclusion.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL ASSOCIATION.

In consequence of the passing of the New Pharmacy Act, a General Meeting of the Members of the Trade was held at Sheffield, on Friday, October 9th, when it was thought desirable to form an Association for the purposes of mutual interest, to be called the "Sheffield Pharmaceutical and Chemical Association." The Rules proposed were discussed and agreed to, and 73 gentlemen gave their names to the Secretary to become Members of the Association. The chief object of the Association is educational, there being an intention to open classes for the junior members of the trade, so as to facilitate their joining the Society in London. The provisions of the Pharmacy Act were then considered, and some objections were made to the details in that portion of the Act relating to the sale of Poisons. After the usual complimentary votes, the meeting separated.

THE COLCHESTER CHEMISTS' ASSISTANTS' ASSOCIATION.

The first meeting of the above Association took place on Thursday, the 22nd of October. The attendance was very good, every shop being well represented.

After partaking of an excellent supper, the subject of the evening was introduced (the Pharmacy Act). Various opinions were given as to the application of the Bill, and it was finally resolved to tender the thanks of the Association to the President of the Pharmaceutical Society and other gentlemen who have assisted him, and also to congratulate them upon the success of their undertaking.

ORIGINAL AND EXTRACTED ARTICLES.

REMUNERATION FOR RESPONSIBILITY.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—The best thanks of all engaged in the anxious labours of retail pharmacy are due to Mr. R. W. Giles for his deeply interesting letter to the Norwich Conference, on the relation between "Pharmaceutical Responsibility and Remuneration."

The hope of better days, when the pharmaceutist shall be regarded as a member of an honourable and worthy profession, rests not so much, I think, on the fact of his being legally recognized and protected from competition with ignorant meddlers with remedial agents, but upon the excision and abandonment of illegitimate departments of his business, and a more exclusive devotion of time and talent to his true profession. To do this, however, a considerable augmentation must be made in charges, which cannot longer be based upon the intrinsic value of medicines, nor upon the time occupied in their dispensing, but on the knowledge which enables the dispenser faithfully to further and interpret the wishes of the physician, thus rendering the former responsible trustee of the public weal.

Since illness is an exceptional condition, and medicines only the need of the sick, and as prescriptions are in the highest degree urgent and specific instructions, requiring peculiar and precise manipulation, so then in proportion must charges be unusual and as independent of ordinary commerce as would be the cost of a *special* train compared with the stated fares of the regular traffic.

The social status of an English pharmaceutist is, without contradiction, abased by the trade he conducts in goods in nowise to be regarded as accessories of pharmacy. This rule applies generally, but more particularly to the provinces. Years, long and many, will come and go before a country pharmacy will be able to support itself by a commerce purely medical. Not until country practitioners shall cease to dispense their own medicines, and no longer supply surgical appliances, can this be effected.

How has protection influenced pharmacy in other countries? My experience in France and Italy goes to prove that although the pharmacien of the Continent may be *mieux considéré* than of yore, he is still, as Dorvault says, but "a slave in the midst of free citizens," for unless he happen to be the lucky proprietor of some successful speciality, his position, too poor to support the expense of an assistant, is one of the most painful imaginable, since, "independently of his loss of liberty, he has neither the leisure nor the inclination to occupy himself with scientific labours." The secret of his non-success, materially speaking, lies in the fact of his charges being ridiculously insufficient. These are, to some extent, kept down by tradition, it being the popular belief that enormous profits appertain to dispensing. The Continental pharmacien possesses an advantage over the greater portion of his English brethren, in having, generally, a well-fitted laboratory attached to his pharmacy.

I am not, however, of opinion with Mr. Giles, that pharmaceutical preparations, such as vegetable extracts, pilula hydrargyri, or unguentum hydrargyri, could be as well or as cheaply prepared at home as by wholesale manufacturers whose exclusive attention is directed to their production, and whose machinery and apparatus are of a kind far beyond the reach of the retail pharmacist.

In regard to a suggestion made at the Norwich Conference that the examination of assistants under the new Act should be "local and simultaneous," it seems to me that the necessary organizing of various centres of examiners would involve a vast amount of trouble, and that it would be more satisfactory to assistants that they should be examined at the parent institution, from which the honour of a successful issue would seem the greater and the more substantial. It would likewise be the only means of ensuring a test of proficiency of equal rigour in each case.

In conclusion, should the necessity of still further ameliorating the pharmacist's position form the basis of future legislation, let us hope he may be treated in a respectful and considerate spirit, having in grateful remembrance those illustrious members of the confraternity who have contributed in all ages to the advancement of human progress by their scientific discoveries, not for-

getting those who are still working, disinterestedly and for the love of the work, towards the same noble end.

I am, Gentlemen, yours very respectfully,

WALTER A. POWELL.

151, *Westbourne Terrace, Hyde Park, W.*

THE BENEVOLENT FUND.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—The general attention of the trade being just now especially drawn to the Pharmaceutical Society, the opportunity appears favourable to the circulation of a statement of the relief granted to and the urgent necessities of the several candidates to whom annuities or temporary aid have so far been afforded from the Benevolent Fund. Taking the list of candidates for this year, we find one has toiled forty years, another thirty-five, and, again, another thirty-three years, these periods being irrespective of pupilage and assistantship, and ending in failure and sickness.

Four candidates there are beyond the number of annuities at the disposal of the Committee, all needing aid equally with the two successful applicants. The votes registered in their favour, it is true, count in promotion of their election next year, but, at ages ranging from sixty-one to seventy-five, under the pressure of sickness and necessity, a few friends here have thought a shilling collection might be made through the country and prove a solace to their disappointment. So warmly has this proposal been seconded, that twenty-five contributors have enabled me to forward you £2 4*s.* 6*d.*; the amount is but small according to our town, but it represents nearly all to whom it has been mentioned. To revert to my first observation, I find many (of course non-members of the Society) are quite unaware of any aid at all having been granted yet, and others who even *knew nothing of the existence of the Fund.* It appears, then, that one or more volunteers in each town, furnished with the proposed statement, might lead to our establishing ere long additional annuities, for I have, in my few calls, met with expression of deep sympathy for the distressed, leading to a hope that many subscribers may be added to the original Fund. The small sum contributed to this special purpose, even should I be enabled to spare time to add to it after, would give but little when divided by four; I send it, however, at once, trusting to its being supplemented elsewhere and proving the means of introducing the claims of the Benevolent Fund where unknown.

I remain, Sir, obediently yours,

T. G. MUSSON.

Highgate, Birmingham.

P.S. The contributors to my little list would mostly prefer its not being published, but as the only means of acknowledging the sums, I append names:—Messers. J. Allen, W. J. Atkins, H. J. Adkins, A. H. Foster, W. S. Gray, J. H. Lucas, F. S. Morris, H. Pedley, C. Packwood, G. D. Tomlinson, F. Williams, 1*s.* each; G. Dymond, 2*s.*; H. Sanderson, 2*s.*; S. Grieves, 2*s.* 6*d.*; G. M'Isaac, 2*s.* 6*d.*; Henry Whittles, of Churchill and Son, 3*s.* 6*d.*; Snape and Son, 3*s.* 6*d.*; C. Arblaster, 5*s.*; T. G. Musson, 5*s.*; W. and A. Southall, 5*s.*

REMARKS ON SENNA.

BY T. AND H. SMITH, EDINBURGH.

We have read with great interest the paper on "Senna," contributed to the Pharmaceutical Conference by Mr. Groves, and published in the October

number of the Society's Journal. The subject is important and interesting in itself, and the novelty of the facts stated, and the information yielded as to the real nature of the cathartic principle of the drug, must draw the attention of pharmaceutists and medical men to its value. The interest of the paper was enhanced considerably to us, by the fact that we had spent much time in endeavouring to isolate the purgative principle, and obtain it in a form capable of producing all the beneficial physiological action of the infusion, unaccompanied with the feelings of sickening and loathing experienced by almost every one at the very thought of the drug. Whatever interest to ourselves our own labours in connection with senna may possess, we would not have thought of making them public, but for the belief that they may be of some value to others, if only by confirming, in the main, the results arrived at by the author of the paper in the Society's Journal, and those gentlemen whose works he quotes. We claim nothing that can in the least lessen the merit of these chemists, and the honour due to them for what they have so ably done.

It is now nearly thirty years since our investigations led us so far as to find that the principle of senna, upon which its cathartic action depends, could form a solid compound, which, in the dose of 4 or 5 grains, possessed all the beneficial action of a full dose of senna infusion. The method adopted by us to obtain the compound in question, was this:—The watery infusion of senna was concentrated in a good vacuum to not too thick a syrup. The extract was then wrought up with abundance of rectified spirit, which caused a separation of the gummy and other inert matters in a solid form, and, if the concentration had not been carried too far nor the spirit too strong, the active material was entirely contained in the spirituous liquid. It was found to be of the utmost importance that the spirit should not be above a certain strength, for if attention to this point was neglected, a portion of the active principle (more or less, according to the strength of the spirit) was found in the solid matter separated. There is, however, a sure rule for knowing when the spirit is too strong or the extract too thick, and it depends on the circumstance that when an aqueous extract of senna is mixed up with too strong spirit, the separation produced by the action of the spirit forms clotty masses, instead of a more or less loose solid. When the separation forms clotty masses, the remedy is to pour off the spirit and mix in as much water, with the clots, as will completely disintegrate them. The resulting solution, or syrupy liquid, is again treated with the rectified spirit before used, and as much more as may be necessary. By this means a spirituous solution is obtained containing the whole of the cathartic principle of the senna.

The liquid thus prepared gave us the means of obtaining the compound above referred to, which is composed of a mixture of acids and other substances combined with lime, and free lime. So far as it could be tested by its action on the human frame, it contained all the active principle of the quantity of senna from which it was obtained. To prepare it, slacked lime was made into a milk and added to the spirituous solution of the extract of senna above mentioned, and the resulting precipitate on being collected by filtration, washed with strong spirit, and dried as much as possible by strong pressure between folds of blotting-paper, was found, as already mentioned, to be a powerful cathartic in the dose of 4 or 5 grains.

The denial of the solubility of the active principle of senna in strong spirit, made by Mr. Groves, is in part correct, but cannot apply to the tincture of senna of the British Pharmacopœia, as the spirituous solution which gave us the cathartic compound was, at the least, above proof, and was found by ourselves in experiments on our own persons, to have the full strength of its equivalent of senna leaves.

After reaching the length we have indicated in our researches, we were re-

luctantly compelled to desist making any further attempts to arrive at the end we had in view, at least for the time, but we never lost the hope of resuming our investigation under more favourable circumstances. In an investigation of the nature of the present, it is evident that wrong steps must be checked by using the human frame as a medium for testing the existence of a cathartic power in any product. In consequence of this constantly recurring necessity and the difficulty of getting or asking another person to submit to the, at least disagreeable, ordeal, we were led to dose ourselves to such an extent as to bring on, in one of us, a state of irritation of the whole mucous membrane of the alimentary canal, extending even to the nostrils, and the effects of which have not disappeared even to this day, so that we were compelled to throw aside the whole investigation, and it affords us much pleasure to see that it has been taken up and so well wrought out by others.

REPORT OF AN ANALYSIS OF THE EIGHTH REMITTANCE OF BARK FROM INDIA.

BY J. E. HOWARD, F.L.S.

To the Under Secretary of State for India.

September 1*st*, 1868.

Sir,—I have to report on specimens of bark collected in March of the present year, and sent to me for analysis, as follows:—

No. 1, *C. succirubra,* being the "third harvest of renewed bark," is most interesting, as it showed more completely than any sent hitherto the aspect of the red bark from South America, and has, in all respects, a superior appearance. In examining it chemically, I found that it presented also more exactly the counterpart of that composition which I have described as being commonly observed in the analysis of the older bark of this species. I hoped to obtain a larger produce than last time, but was disappointed in finding a smaller amount of salts of quinine, viz. 6·15 per cent. against 8·45 per cent. in the specimen of renewed bark from the same tree on which I had the honour to report in February, 1867.

The above figures give the *relative* commercial value of the two specimens; but, as I thought it desirable to obtain all the information in my power, I endeavoured, in two experiments, with a sufficient quantity of bark (¼ lb.) in each, to arrive at the most correct results. From the first I obtained quinine as alkaloid, capable of being formed into, and equivalent to 5·33 per cent. of sulphate of quinine. From the second, by a process somewhat varied, I obtained in crystallizations of refined oxalate 4·80 per cent., and remaining in the liquor as more soluble (in part, perhaps, oxalate of cinchonidine) 0·60, together 5·40 per cent. oxalate of quinine. In both cases there was an inevitable loss through the product being more exactly purified, and therefore this must be borne in mind in comparing these figures with those previously given; but, even at this lowest or *minimum* scale of production, the results are really surprisingly good, though not equal to the hopes entertained by Mr. M'Ivor.

The explanation of a smaller produce of *sulphate of quinine* appears to me to be found in the *idiosyncrasy* of this particular species, which I have described to the best of my power in my 'Illustrations of the Nueva Quinologia,' *sub voce C. succirubra.*

I am pleased to find that Mr. Broughton, in his first report, corroborates what I have said as to the difficulty of obtaining the alkaloids in a pure state from this species, a difficulty which increases with the age of the tree. On this account I must again urge the necessity of carefully ascertaining what species are likely to yield the best *permanent* results.

The precipitated hydrated alkaloids, in a subsequent examination, of a small portion of the present bark against a re-examination of a portion remaining from the second harvest, gave me for the *second harvest* of renewed bark—

Alkaloids dried at the temperature of the air		10·60
Of which soluble in ether, quinine, etc. . . .	8·70	
„ „ insoluble in ether, cinchonine, etc. .	1·90	

For the *third* or *present harvest* of renewed bark—

Alkaloids dried at the temperature of the air		11·20
Of which soluble in ether, quinine, etc. . . .	9·40	
„ „ insoluble in ether, cinchonine, etc. .	1·80	

It will be seen that the proportion of alkaloid has increased, but this would be no guide to the commercial value, which is almost entirely regulated by the proportion capable of being converted into crystallized salts. More valuable commercial information, consequently, will be gained from the following corrected analysis:—

Quinine (as sulphate)	5·33	
„ uncrystallizable	2·00 (?)	
		7·33
Cinchonidine		1·14
Cinchonicine		0·53
		9·00

I have attached a (?) to the weight of the proportion of uncrystallizable quinine, which it was impossible to ascertain exactly from so small a quantity of bark. Moreover, from its great implication with resinous colouring matter, I am led to doubt the possibility of obtaining any part of it as crystallized sulphate of quinine on a large scale. This uncrystallizable portion is, therefore, unimportant and not to be reckoned, from a commercial point of view, as possessing any value to the purchaser of such bark for manufacturing purposes.*

The analysis of No. 2, "Root bark from a tree of *C. succirubra* seven years old," presented much interest, as bearing on the question as to which of several modes of cultivation is to be preferred, since it has recently been proposed to cultivate the plant, like madder, solely for the roots.

I consequently have forwarded about half the sample of No. 2 and also No. 3 (of which a very small quantity was sent from India) to Dr. de Vrij, as it was desirable thus to arrive at a consentaneous agreement on the value of the root bark, which I have always regarded unfavourably, judging from the root bark of *C. Calisaya*, var. *Josephiana*, occasionally found in the market.

The analysis was troublesome, although the hydrated alkaloids were obtained in a state more free than often from colouring matter. The weight of the precipitated alkaloids appeared to be 12·75 per cent., but this hopeful amount did not yield proportionate results, probably from an amount of wax and resin being carried down with the alkaloids. I obtained with difficulty a small crystallization of sulphate of quinine, and the remaining liquor, when precipitated, dissolved in ether, and the solution left to concentrate by evaporation, furnished crystals of cinchonidine adhering to the sides of the vessel, and at last uncrystallizable quinine containing a portion of quinidine.

The remarkable feature was the large production of fine cinchonine, quite insoluble in ether, yielding good crystals from spirit of wine, and these, when formed into sulphate, giving the very characteristic salt. In all this the root bark is decidedly superior; but, it will be observed, it is *cinchonine*, and not *quinine*, that (at all events in this species) is the product of this root bark. I give the total as follows:—

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* The weight of the crystallizable, and consequently more valuable portion, was ascertained by the following process:—The 6·15 per cent. (as above) having been precipitated, the precipitate was dissolved in ether, separating thus the cinchonidine and the quinine, then dried at 212° F. It must be understood that quinine thus obtained from the *C. succirubra*, although sufficiently pure to pass the tests required in commerce, retains some cinchonidine, which can be separated by solution in acid and subsequent treatment with iodide of potassium.

Quinine (as sulphate)	1·75	
„ uncrystallizable	4·50 (?)	
		6·25
Cinchonine		3·00
Cinchonicine, water, and gum resin . . .		3·50
		12·75

This root bark would not be of more value than that mentioned above (of the *C. Josephiana*) unless it were wanted for the extraction of cinchonine.

No. 3. I shall transmit the report of the analysis when I receive it from Dr. de Vrij.

No. 4 consists of four pieces of fine-looking crown bark, apparently not intended for chemical analysis.

Nos. 5, 6, and 7 are interesting to me, and will, I hope, furnish some facts for a work which I am publishing, 'On the Quinology of the East Indian Plantations.' They appear to be intended rather for microscopical examination than for chemical analysis. The seeds of No. 7 have been sent to Kew.

I beg to remain, yours very truly,

JOHN ELIOT HOWARD.

SUPPLEMENT.

Copy of a Letter from Dr. de Vrij to J. E. Howard, Esq., containing Analysis of No. 2 Root Bark.

The Hague, August 30th, 1868.

The sample of No. 2, *Cinchona succirubra, root bark, from a tree seven years old*, with your letter of the 21st instant, duly reached me, and immediately I have set to work to analyse this bark, which was very welcome to me, particularly because now you have the opportunity to judge by yourself of the richness of the *root* bark, at least, of the cultivated cinchonas.

I found in the bark 11¾ per cent. of alkaloids and 0·467 per cent. of cinchona bitter (kinovic acid). The part of the alkaloids soluble in ether amounts to 4·31 per cent. of the bark. Although these 4·31 per cent. are soluble in ether, they do not entirely consist of quinine (crystallizable), but contain another alkaloid also soluble in ether. As you expressed your wish to obtain the results of my experiments within about ten days, I have not been able to ascertain with certainty which is this alkaloid which accompanies the crystallizable quinine in its etherial solution. I suspect it is the amorphous alkaloid which I always find in the Indian barks, but am not yet quite sure of it. I obtained beautiful herapathite from the part of the alkaloids dissolved by ether, so that there is no doubt that this root bark contains really crystallizable quinine. In treating the total amount of alkaloid with ether, I had some reason to expect to obtain also cinchonidine. In this I was, however, frustrated, for I could not find till now with certainty its presence. At this moment that I write this letter my result is that the mentioned bark is rich in alkaloids, of which the part *insoluble* in ether consists chiefly of *cinchonine*. If cinchonidine is perhaps also present, it can only be a very small quantity, not to be compared with the large quantity which I obtained from the stem bark of *C. succirubra*.

Copy of a Letter from Dr. de Vrij to J. E. Howard, Esq., containing Analysis of No. 3 Root Bark.

September 18th, 1868.

Together with your valued letter of September 3rd I received the No. 3 of root bark from *C. succirubra*. . . . As the amount of the powdered bark dried at 212° F. was only 19·5 grammes, I divided this quantity into two parts, viz. one of 10 grammes (the quantity which I always use), and one of the remaining 9·5 grammes. From the first I obtained 1·202 grammes, and from the second 1·088 grammes of alkaloids. The average percentage of alkaloids in *this* red bark is therefore 11·743 per cent., whilst the amount of kinovic acid is 0·676 per cent. The combined amount of the obtained alkaloids, viz. 2·29 grammes, was dissolved in dilute acetic acid, by which treatment only an imponderable trace of dark brown resinous matter remained undissolved. As the acetic solution proved to contain no quinidine, it was shaken with caustic soda and ether. The

following day the etherial solution, which was lemon-coloured, was evaporated, and the residue dried at 212° F. Its amount was 0·931 gramme; this root bark contains, therefore, 4·774 per cent. of alkaloid soluble in ether. I obtained from these 0·931 gramme beautiful herapathite, but found, in the meantime, that the largest part of this alkaloid soluble in ether *is not quinine*, but an amorphous alkaloid. I am still occupied with researches to find out the real nature of this amorphous alkaloid. . . . The remaining alkaloids, which were not dissolved by ether, proved to be *cinchonine*, with only a trace of cinchonidine. In this root, like in the former, I found the cinchonine particularly fit to crystallize, and consequently I obtained beautiful sulphate of cinchonine from it.

J. E. Howard, Esq., to C. R. Markham, Esq.

For the guidance of the Indian Government I send the foregoing interesting and well executed analysis, and add that it accords most nearly with the previous analyses by Dr. de Vrij and myself of No. 2 of *Root Bark* of larger size, but of the same parcel, and that these specimens of root bark would command but a low price in the London market from the causes before stated. I do not think the root bark of *this species* would repay cultivation.

ON THE TRUE METHOD OF KEEPING THE SYRUPUS FERRI IODIDI FREE FROM CHANGES.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Sirs,—Recent experiments on the syrupus ferri iodidi have led me to the conclusion that this syrup can be made to keep for any length of time without undergoing its usual changes. A large quantity of this syrup, made strictly according to the British Pharmacopœia, now over two months, is at this moment as perfectly colourless as the day it was made.

Three ounces of syrup were divided between three one ounce-phials; one corked, one stoppered, and the other, mouth well capped over with two folds of thick vegetable parchment, previously moistened in water. The corked phial with contents was then placed in a cold dark corner in the cellar,—the usual place for keeping this syrup. The stoppered one, with contents, was next placed into a small jar, half filled with cold water; and that capped over with vegetable parchment was kept in a warm position in the shop, alongside the mother syrup. Two weeks lapsed away, and they were examined. The syrup in the corked phial assumed a dark brown colour, which was formed nearest the cork and gradually descended. The cork exhibited the usual result,—a blackish colour,—produced by the action of the iron on the tannin naturally existing in corks. The syrup in the stoppered phial had undergone a more rapid and complete change of colour; but not to any degree as dark as that just described. It indicated more of the pure oxide of iron in solution. On the application of heat (the phial being placed in a water-bath) the syrup was again rendered colourless; whilst, on the other hand, that capped over with vegetable parchment, in the manner described, now remains, with the mother syrup similarly treated, perfectly colourless, and there is not the slightest indication of its ever changing.

From these results not the slightest doubt can exist on the fact that as the agency of heat is required to effect the *quasi*-chemical combination of iron and iodine, it follows, therefore, that to keep this compound stable, the syrup should always be kept in very warm position. The prejudicial use of corks should be entirely dispensed with. Stoppered bottles may be used with advantage; but the subsequent crystallization of the sugar around the stoppers renders them objectionable. Thick vegetable parchment I found answered

admirably well; and, in every instance in which it may be used for the future, a small piece of thick blue paper should finally be tied over it. All cold cellars tend to promote the oxidation of the iron and its final separation from the iodine; they should be particularly avoided. In fact these observations are equally applicable to all syrups containing iron. In conclusion, I may be permitted to sum up :—

1. If the syrup were to be made thicker than usual, it would prove an additional advantage to what has been stated.
2. Thick vegetable parchment should be used to cap the bottles, in lieu of corks or stoppers.
3. The syrup should always be kept in a warm place.
4. By following these *minutiæ* the syrupus ferri iodidi will keep colourless for an indefinite period.

I am, your obedient and obliged servant,
J. Hughes.

14, *Grand Parade, St. Leonard's-on-Sea, Sussex,*
September 15, 1868.

POISONOUS DYES.

On Tuesday, September 29, Mr. Webber made a statement at the Guildhall before Mr. Alderman Dakin, on the poisonous dyes used in some of the coloured socks now in use. In the course of his practice he had met with cases in which this dye had caused great constitutional and local complaint. The new colours were brilliant, but the dye contained a poison, the nature of which had not yet been ascertained, but it was stated that the men who made it were not able to work at it more than six months. The colour which appeared to contain the poison most was a brilliant orange, but it more or less pervaded the other colours. Mr. Webber stated that the manufacturer had now discontinued the use of these dyes. Dr. M'Veagh, of Coventry, in a letter to the 'Times,' gives similar experience as to the effects produced by these coloured socks, and states that he has been informed these colours are produced by some aniline dye.

The following report of analysis of some socks in May last is communicated by Dr. Tarral to the 'Times :'—

"REPORT OF CHEMICAL ANALYSIS.

"The sock is composed of three textile substances.

"1. and 2. A mixture of wool and cotton forms the violet ground.

"3. The red bands are in pure silk.

"The violet ground is coloured with the violet of aniline, a colour much used in dyeing. The discovery of it is due to Hofmann, of London. This colouring matter is prepared with aniline, which latter is obtained from benzine. The silk is dyed with fuchsine, a red of aniline, which is also prepared from aniline. The red colouring matter is pure fuchsine; it is not accompanied by any substance recognized as poison. It is to the fuchsine alone that the occurrence can be attributed. Aniline violet and fuchsine are prepared by different processes. They constitute two processes which have not the same composition. It is remarkable that the violet of aniline, which is derived from benzine, should have no action, while that of the red of aniline should be so energetic; it is for science and the public to appreciate a fact so new and so important. In presence of the circumstances described and of the accident to Mr. M——, the question arises how fuchsine, which has been used largely in dyeing for ten years past, has never been discovered to possess any poisonous property. The reply would be that up to the present time it has been used only for articles of dress not coming in direct contact with the skin. The present is the first case in which I have met with fuchsine used for stockings. The stocking is of all others the article of dress brought most into contact with the skin, round which it is moreover compressed tightly by the shoe. I must remark also that fuchsine is soluble in weak acids. Perspiration is acid, and is,

nowhere more profuse than in the feet, where, confined within the shoe, it is absorbed by the tissue of the socks.

"In conclusion, the accident to Mr. M—— shows clearly that fuchsine is poison."

Professor Wanklyn, in the 'British Medical Journal,' October 10, observes, in reference to arsenic in aniline colours,—

"It is generally known that some of the old crude magenta cake and liquor which was in the market some few years ago, shortly after the first bringing out of the dye, was largely contaminated with arsenic. But it is not generally known, even to chemists, that much of the beautifully crystallized magenta used to consist of arseniate of roseine, being not, properly speaking, contaminated with arsenic, but actually consisting of an arsenical compound. In the early part of 1863 (assisted by Mr. Robinson, who was my assistant at that time), I made an examination of the beautifully crystallized magenta which was being manufactured in one of the largest coal-tar colour works in Europe, and found it to be arseniate of roseine, apparently chemically pure. The following is a comparison between the calculated numbers for pure arseniate of roseine, and those actually found on making a combustion.

$C_{20}H_{19}N_3, AsO_3H$.

	Theory.		Found.
C_{20}	240	56·47	56·56
H_{20}	20	4·70	4·91
N_3	42		
As	75		
O_3	48		
	425	100·00	

"Both the nitrogen and the arsenic were determined; and, though the numbers given were not by any means accurate, were still quite near enough to confirm the formula, $C_{20}H_{19}N_3, AsO_3H$.

"Since 1863 there have been great changes in the mode of purifying magenta; and I hardly think that this pure arseniate of roseine would be found largely to-day. Still it would be rash to assert that this kind of magenta has entirely disappeared from the market. But, be this as it may, there is reason to fear that most of the magenta, and also all those common blues and violets which are made from it, are more or less contaminated with arsenic. To mend the matter, it is not generally known to chemists, but is nevertheless quite true, that the mere detection of arsenic in aniline colours is not always easy—even when large quantities of arsenic are present; the aniline colours having the property of masking the presence of arsenic to a very great extent."

Mr. William Crookes states ('Times,' Oct. 16) that arsenic has nothing to do with the effects described, as no arsenical compound, in connection with aniline dyes, has been sold for many years; and he observes that all the colours complained of contain one ingredient in common,—a brilliant and fast orange dye (the different shades being produced by the admixture of this orange with other harmless colours), which he has succeeded in identifying as one of the several aniline orange dyes which have been introduced into commerce during the last eighteen months. It possesses acid properties; is insoluble in water, but soluble in alkalies; it gives a very stable dye on silk and wool, and, under exceptional conditions, would be capable of producing an irritating action on the skin. Mr. Crookes thinks that the reason there have been so few complaints arises from the fact that normal perspiration is slightly acid, and consequently will not act upon the insoluble acid dye, but that, under exceptional circumstances, the perspiration may become alkaline, when a portion of the dye would be dissolved and become absorbed.

ATTEMPTED SUICIDE BY "RED PRECIPITATE."

At the Bow Street Police Court, on Tuesday, October 13, Selina Jones was charged with attempting to poison herself with "red precipitate." She was found in the street and was taken to King's College Hospital, where she recovered.

Mr. Flowers, the magistrate, in commenting on the case, made the following statement:—"It was important to make it generally known, and especially to remind all who deal in drugs, that an Act had recently been passed, the 31st & 32nd Victoria, c. 121, making it unlawful to sell any poison unless labelled with the name of the seller and of the article sold, and with the word 'poison.' Besides this, certain poisons commonly used are not to be sold at all to any one unknown to the druggist, unless the stranger be introduced by one whom the druggist knows. As regards these latter kinds of poison, the druggist is required to enter in a book the name and address of the purchaser, and what he wants the drug for, which entry must be signed by the purchaser and (if he be a stranger to the druggist) by his introducer. Unless these regulations are complied with, the seller is liable to heavy penalties on summary conviction before a magistrate. In this case it did not appear that any of the conditions had been complied with, but he had not asked the name of the chemist, as he might, perhaps, not have known of the Act which had been so recently passed. If, however, he had been brought there, he would have had no alternative but to impose for the first offence a penalty of £5, and should he persist in selling poisons in contravention of the Act, £10 for the second offence. He trusted that publicity would be given to this caution, and that for the future the provisions of this most salutary enactment would be more scrupulously observed."

FATAL ACCIDENT WITH "DIAMOND OIL."

At the adjourned inquest on the bodies of John Stokoe, Mary Stokoe, Mary Swinburne, and Isabella Taylor, who died from the effects of burns received by the ignition of a quantity of diamond oil at Washington, near Newcastle-upon-Tyne, Dr. Jones stated that he had experimented with the oil. He put some into a saucer, and held a lighted match two inches above it, and the oil ignited. The oil ignited at a temperature of 60 degrees.

Alderman J. L. Bell, Washington Hall, manufacturing chemist, stated that he was not prepared to give any opinion as to the chemical constituents of oil, or the source from which it was obtained; it was, to the best of his belief, what chemists call a "hydrocarbon." He handed in an elaborate statement of experiments he had made with the diamond oil, and opinions as to the use of oils for domestic purposes. After speaking of the nature of oils generally, he said:—"I will now endeavour to show you how far the so-called 'diamond oil,' which has been the cause of the calamity engaging your attention, fulfils the conditions that I have just laid down as being required to ensure safety. Assisted by my friend Mr. Percey, we found that a drop or two placed in a tube instantly, and without any application of heat, gave off a highly inflammable vapour. Poured into a dish, the oil itself indicating a temperature of only 59° F., a lighted match communicated flame when held at a distance of one and a half inches from the surface of the liquid, which then took fire, and continued to burn. This is simply due to the circumstance that, even at this low temperature, an extremely inflammable vapour was emitted. A quantity thrown on very moist ground, after being absorbed by the earth, took fire instantly on the application of a lighted match, and burnt with a large flame, in spite of a violent wind. The specimen of oil sent from that supplied to Mrs. Hunter boiled at 130° F., gradually rising to 185°, at which point it remained stationary. This change in the boiling-point is due to the gradual evaporation of some of the most volatile constituents of the oil in question. Under the most careful treatment, therefore, there can be no doubt, that this so-called diamond oil is highly dangerous, and utterly unfit for the purpose for which it was supplied to Mr. Stokoe. Unfortunately, in the case under consideration, the dangerous properties to which it was, from ignorance, as I understand, in the absence of all instructions, exposed, were greatly intensified. In the first place, it cannot be too much insisted on that all oils, approaching however remotely to the nature of this, should be kept in suitably strong vessels. In the present instance, not only was the jar, in which it was delivered from the dealer, itself of earthenware, but its sides were so thin as to break when merely overturned. From the evidence it would appear that the jar, containing two gallons of oil, had been for some time in a small kitchen, in which all the cooking operations for nine persons were being carried on. An examination of the premises would induce me to suppose that in all probability the atmosphere of the small room

would not be under 80° F. It is needless to say that the emission of vapour at this temperature (21° F. above that mentioned in our experiment) would be greatly increased; and experiment has fully confirmed this view of the case. In my opinion, after the oil had flowed over the floor (itself, no doubt, highly heated next to the fireplace) vapour would be given off so rapidly as to inflame before the liquid oil had reached the fire. In a second the increase of temperature by the now burning oil would increase the evolution of vapour, and speedily filled the entire chamber with flame.

Mr. Haile said the house he represented sent out 2500 gallons of oil per week.

Alderman Bell.—I would not like to have the responsibility of sending out 2500 gallons per week.

John M'Laren Fleming, the representative of Messrs. Binning and Son, the patentees of the diamond lamp and manufacturers of diamond oil.—The oil he sent was the lighter or most volatile portions of petroleum and paraffin oils together. Diamond oil had been extensively in use during the past four months in Great Britain and in some parts of the Continent. He did not consider the oil explosive, but it needed to be used with care.

The coroner, in summing up the evidence, drew attention to a handbill issued by Messrs. Binning, stating the qualities of the lamp, and "perfect safety guaranteed."

The jury returned the following verdict:—"We are of opinion that Mary and John Stokoe, and two others, came by their deaths by the upsetting and breaking of a bottle containing two gallons of diamond oil, the same igniting at the fire. Also, that the patentees, Messrs. R. Binning and Son, and their agent, Mr. Logan, have been highly negligent in not giving proper precautions to purchasers of the dangerous nature of the oil; and we consider the handbill published by the manufacturers calculated to mislead the public. We consider the oil, from its highly inflammable character, to be unfit for domestic use. We beg to call the attention of the police and the county magistrates to the illegality of moving such dangerous compounds. We beg to thank Mr. Bell for the information he has kindly given on the subject."

An intimation was given that the handbill referred to would be withdrawn, and that Messrs. Binning would, in future, notify to all persons the nature of the oil.

Obituary.

DR. W. B. HERAPATH.

The death is recorded of Dr. William Bird Herapath, of Bristol; he died at his residence, Old Market Street, Bristol. Dr. Herapath was the son of the late Mr. William Herapath, so eminent as an analytical chemist, and, like his father, had attained to a high degree of knowlege and skill in the same science. Dr. Herapath's name has also been associated with some useful discoveries in the microscope. Deceased, the cause of whose death was jaundice, leaves a widow and six children. On passing his M.B. examination, in 1844, at the London University he took honours in no fewer than six branches of medical knowledge. He subsequently became an M.D. of the same university, and his rapid and brilliant succession of chemical and toxicological discoveries was rewarded by the Fellowships of the Royal Societies of Edinburgh and London, and corresponding membership of most of our learned bodies. Among a mass of scientific communications to various periodicals, we may mention his papers on the "Optical and Chemical Characters," "Sulphate of Soda Quinine," on the "Iodo-Sulphate of the Cinchona Alkaloids," "Discovery and Manufacture of Artificial Tourmalines," "Address on Chemistry in its Relation to Medicine and the Collateral Sciences," "On a New Method of Detecting the Hydrogen, Arsenic, and Phosphorus when in company as Mixed Gases," etc. Although suffering from an exhausting and painful disease, his zeal for science remained until the last, and, within a few days of his decease, he was engaged in laborious researches with spectrum analyses, more especially as to bloodstains and the chlorophyll of plants. His early death, at forty-eight years of age, will be deeply regretted by a large circle of professional and other friends.

MISCELLANEA.

Antimonial Poisoning.—A curious case of antimonial poisoning has been under investigation at Melbourne. One Bellemey was an assistant at a shop of Mr. De Barr, chemist, Goulburn, New South Wales. Mrs. De Barr, a woman of very intemperate habits, eloped with him in August, 1866, carrying a considerable sum of money with her. The pair arrived in Melbourne in September under the name of Barnett, and passed as man and wife. On shipboard Mrs. Barnett had been attacked with severe vomiting which continued even after landing. She was attended by Mr. Beaney, who was called in by the prisoner to see her, and she was somewhat relieved. The same symptoms, however, again manifested themselves, and seemed utterly inexplicable to Mr. Beaney, though Dr. Turnbull, who was called in at this juncture, attributed them to excessive drinking. The woman continued to get worse and waste away gradually, and was confined to her bed. Mr. Beaney then called to his assistance Drs. Brownless and Girdlestone. They concurred in attributing the disease to antimonial poisoning, and by their direction a hired nurse was engaged to attend her, the prisoner being directed not to give her anything. Under this treatment she recovered a little, and was then taken to other lodgings; but two or three days after Barnett (or Bellemey) dismissed the nurse, on the score of the expense she caused, and of being of no use. On July 24 (Mr. De Barr having died in the meantime) Bellemey and Mrs. Barnett were married—the marriage having taken place at the solicitation of the other lodgers in the place. On August 3 Mrs. Bellemey died, and a post-mortem examination discovered large quantities of antimony in many organs of the body. To meet the case launched against him, it was proved for the prisoner that the woman was a great drunkard; that she had been seen habitually to take pinches from a bottle labelled tartar emetic; that a few weeks before her death she took daily a number of seidlitz powders. It was shown that the *cheaper descriptions of these powders contained antimony;* and that these powders and the emetic are frequently taken to relieve the effects of drunkenness. The jury acquitted the prisoner, and, it is said, that whatever suspicions may have been entertained at first, and are still held by some, the greater number of those who heard the evidence believed in the man's innocence.—*Medical Times and Gazette.*

Accidental Poisoning by Laudanum.—An old man in Manchester, named O'Brien, suffering from bronchitis, obtained an order on a dispensary for a mixture composed of laudanum and ipecacuanha. Having swallowed a dose of it, he found himself so much relieved that he drank off the entire contents of the bottle, on the supposition that the more of the medicine he took the better he should be. He was found dead in his bed the next morning with the empty bottle in his hand. At the coroner's inquest the jury censured the dispenser for giving out medicines unaccompanied by written directions as to the quantity.

Test for the Presence of a Free Acid.—Mr. E. Smith, Nottingham, gives the following in the 'Chemical News' of March 13:—"Dissolve chloride of silver in just sufficient ammonia to make a clear solution. If a little of test be added to ordinary spring water, the carbonic acid present in the latter will neutralize the ammonia, and precipitate the chloride. The above forms a good lecture experiment, the test being a very delicate one."

Poisoning by Vermin Powder.—An inquest has been held at Bristol, on the body of Sarah Ann Grundy, who died suddenly, the symptoms observed being those of poisoning by strychnia, and, in consequence of some rumours, a *post mortem* examination of the body was made, and the contents of the stomach were analysed by Dr. Herapath, who found Prussian blue, starch, and strychnia; from this it was inferred that death had been caused by taking vermin powder mixed with water, but as there was no evidence to show by whom, or for what purpose the poison was administered, an open verdict was returned. The Coroner commented on the fact, that while restrictions were placed on the sale of strychnia and other poisons, these so-called vermin powders, each packet of which contained sufficient poison to kill three persons, were sold indiscriminately.

Suicide by Prussic Acid.—We record a painful case of suicide which occurred

at Balsall Heath a short time since. Dr. Marsden, of Earlston, in a sudden fit of insanity, drank a quantity of prussic acid, which he took from his own laboratory, and died from its effects in about three-quarters of an hour. Medical aid was obtained, but to no purpose. Dr. Marsden was about thirty-four years of age, and had practised for ten years at Moseley and Birmingham, and was much respected. He leaves a wife and ur children.

A Poison for Rats.—According to the French 'Moniteur' there are in France upwards of two thousand millions of rats and other rodents. Supposing each of these little quadrupeds to commit the damage of only one centime per annum, this loss would amount in the aggregate to twenty millions of francs annually. Hence it is most desirable to find some means of destroying this vermin in large numbers as expeditiously as possible. Nux-vomica, arsenic, phosphorus, and traps have been successively tried, but with no very decided success, and certainly not equal to the rate of increase of these prolific creatures. Recent experiments, however, show that squills (*Scilla maritima*), the bulb of which is much used in medicine, is not only a powerful poison for rodents, but also one they are very fond of. The way of preparing it for the desired purpose is as follows:—One of the bulbs is cut into slices, hashed and bruised, then done in the pan with fat, which is afterwards strained through a cloth and poured into broken plates and saucers to be placed in the cellars and other places infested with rats, mice, etc. To prevent dogs and poultry from eating of this poisonous compound in stables, pigeon-houses, or farmyards, it may be put into a wooden box, about a foot and a half long, and having a hole at each end. The rat gets in at one end and goes out at the other, after partaking of the noxious food, which soon kills it. Squills may also be reduced to powder for the same purpose by bruising them in a mortar to a pulp, which is afterwards incorporated with as much flour as it will hold. This paste is then rolled out, as they do for a pudding, then cut into shreds, which are left to dry on hurdles or on sheets of pasteboard, and are afterwards pounded in a mortar. The powder thus obtained will keep for years, and may be put into boxes or barrels. If manufactured on a large scale, it may become a profitable article of exportation. In Algeria squills cost nothing, the country being absolutely overrun with them.—*Times.*

BOOKS RECEIVED.

An Introductory Address delivered at the Westminster Hospital October 1, 1868. By Francis Mason, F.R.C.S. London: John Churchill and Son, New Burlington Street.

Notes on the Metals: being a Second Series of Chemical Notes for the Lecture Room. By Thomas Wood, Ph.D., F.C.S. London: Longman, Green, and Co. 1868.

TO CORRESPONDENTS.

Persons having seceded from the Society may be restored to their former status on payment of arrears of subscription and the registration fee of the current year.

Those who were Associates before the 1st of July, 1842, are privileged (as Founders of the Society) to become Members, and by virtue of membership to be registered as *Pharmaceutical Chemists.*

The Secretary and Registrar desires to intimate that no anonymous communications, or letters signed with initials only, will be answered.

Mineral Waters.—In reference to the "Note on Defective Samples of Potash and Soda Water," in our last number, we have received a communication from Messrs. Ellis and Son, Ruthen, stating that, owing to the great purity of the water they use, they are

enabled to put into each bottle a large amount both of gas and alkali, the specified quantity of the latter being always ensured.

An Assistant's Plea.—The letter from "Another Assistant" was too late for the insertion of so long a communication in our last number, and, on perusal (while we would earnestly urge on employers the necessity of affording all possible opportunities to their assistants and apprentices for improvement), we think the question stated in too antagonistic a spirit to promote the object of the writer. The ordinary business of the shop must be the occupation of the hours of business, and there is usually that practical knowledge to be acquired from it which will be most valuable to so thoughtful a man as our Cornish friend. "*One thing at a time*" is a good old maxim; and if only twelve hours in summer and eleven in winter be required for the shop, there must surely be some other portion of the twenty-four available for study as well as recreation. Our trade partakes of the character of a profession, but it would be a poor compromise and bad policy to make bad tradesmen of those who follow it.

"*Birmingham.*"—'Fowler's Medical Vocabulary.' The new edition will be ready in the spring.

A. P. S. (Liverpool).—See papers by Professor Bentley on New American Remedies, in the Pharmaceutical Journal, Vols. ii., iii., iv., v., 2nd ser.

"*An Apprentice*" (Ipswich).—New editions of both works will be ready in the spring.

"*A Registered Apprentice*" complains of the "partiality" of the Pharmacy Act in not admitting apprentices of three years' standing to the modified examination.

W. H. (Louth).—*Blue-Black Ink*, Vol. IX. (N. S.), p. 434.

"*A Chemist* (King's Lynn).—It will be seen, on reference to the Act, that persons unconnected with the Society, and who were in business previous to July 31, 1868, will be registered as Chemists and Druggists. The position of old members and of members by examination is not altered.

S. W.—The plants alluded to can only be seen in a fresh state in the summer and early autumn. Dried specimens may be seen in the Library of the Society, 17, Bloomsbury Square.

E. R. G.—You may, perhaps, obtain a copy at Kimpton's, Bookseller, High Holborn. The new edition will be ready in the spring.

H. E. Rogerson (Bradford).—Leech-aquaria answer very well. Either of the two plants will suit your purpose.

The Lecture Hour.—"*Another Founder*" wishes to indorse the proposal of "A Founder," in our last number, that the lecture hour should be altered from half-past eight to nine o'clock; which he thinks would be a great boon to those residing in the suburbs of town.

W. L. G. (Devonport).—The declaration may be sent as a registered letter. The Registrar issues a receipt for the declaration.

"*An Old M.P.S.*"—The subject adverted to has been frequently discussed in the pages of this Journal. The tendency of events is in the direction desired by our correspondent.

J. A. (Wiveliscombe).—It may be found in any work on chemistry.

"*Aspirant.*"—(1.) The examinations of the London University, the Pharmaceutical Society, the Society of Arts, and other bodies, comprise chemistry.

G. R.—(1) Yes; (2) yes; (3) any proceedings in the matter must be taken by the Registrar; see the words of the Act; (4) these articles are included in the second part of the schedule; (5) no.

J. E. E. (Tottenham).—*Copying Proprietary Labels.*—The Practice complained of is to be condemned. The only remedy, we fear, is "Registration," which, unfortunately, our correspondent neglected.

A. P. S. (Colchester).—The Society has no power to interfere in the regulation of prices. It is much to be regretted that so low a standard should prevail in certain localities as that mentioned by our correspondent. The subject has of late occupied the attention of the editors, and is one worthy of serious attention.

Robert Walker (Maidenhead).—The Council are not responsible for all the provisions of the Amended Act. Some of its details met with a most reluctant assent,—specially the point alluded to in reference to poisons.

"*An Assistant*" (Montrose).—No. See clause 4 of the Pharmacy Act.

W. F. B. (Tickhill) is thanked for his communication. The contrivance described is

frequently used, but we think by no means supersedes that described by Mr. Brady, which offers certain special advantages.

"*Juvenis*" should ascertain for himself what are the specific gravities he inquires about. (4.) The first London Pharmacopœia appeared in May, 1618. This was circulated among the members of the College and the London apothecaries, but was found to be so imperfect that the greater part of the edition was cancelled, and a new edition issued in December of the same year. It was reprinted, with slight alterations and improvements, in 1621. (5.) 1746.

T. B. A. (Tamworth) will see by our columns that the arrangements respecting the "Sandford Testimonial" have already been made.

J. A. (Musselburgh).—(1.) See clause 16 of the Act. (2.) A duly qualified Assistant would be necessary. (3.) No.

"*A Member*" observes in the various "poison books" lately published some discrepancies in the Schedule of Poisons, articles belonging to Part 1 being placed in Part 2. [Of course the schedule in the Act, not an unauthorized one, must be the guide.]

A. F. P. S.—No.

J. K. (Essex).—A second registration is not required.

Ph. C. (Southampton).—There is no restriction by patent in the case referred to.

"*A Member*" wishes for a means of colouring turpentine to form a bright blue solution for filling a plano-convex lens.

G. W. S. (Hereford).—A Registered Chemist and Druggist, under the new Act, will be eligible for election as a Member of the Pharmaceutical Society.

G. B. (Sandown).—(1.) See clause 16 of the Pharmacy Act. (2.) No.

X.—(1.) Uncertain at present. (2.) The number of plants mentioned applies only to the "Modified Examination."

G. L. (Hertford).—An Assistant on passing the "Modified Examination," provided application be made to the Registrar during the present year, may be registered as a Chemist and Druggist.

H. Howes (West Bromwich).—New editions of Pereira's 'Manual of Materia Medica' and Bentley's 'Manual of Botany' are advertised to be ready in the spring of next year, but we have no information respecting the other two volumes mentioned by our correspondent.

"*A Young Student*" (Yarmouth).—Attfield's 'Pharmaceutical Chemistry.'

A. E. B. (Sunderland).—(1.) Not absolutely necessary, but advantageous. (2.) A knowledge of the new notation is expected. (3.) Yes. (4.) The British Pharmacopœia.

J. R. Morgan (Bombay).—The seeds are derived from *Pharbitis Nil*, Nat. Ord. Convolvulaceæ. They possess purgative properties. (See Pharm. Journ. (N. S.), Vol. VII., p. 496.)

W. B. D. (Tenby).—*Syrup of Phosphate of Iron and Manganese.* Vol. I. (N. S.) p. 288.

"*Bonâ Fide*" (Burnley).—No; he must have been in business prior to the passing of the Act (July 31st, 1868).

"*Inquirer*" (Leamington).—No; he will be registered as a "Chemist and Druggist," and will be eligible for election as a member.

C. J.—All preparations of opium must be labelled "Poison," according to the Pharmacy Act.

"*Dorem.*"—Not necessarily, but it is desirable.

"*A Candidate.*"—Undecided at present.

Communications are acknowledged from Mr. Venables (Liverpool) and Mr. J. Carter.

Instructions from Members and Associates respecting the transmission of the Journal before the 25th of the month, to ELIAS BREMRIDGE, Secretary, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Messrs. CHURCHILL, New Burlington Street. Other communications to the Editors, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. X.—No. VI.—DECEMBER, 1868.

THE DANGER OF PRESCRIBING CONCENTRATED MEDICINES.

A few months ago we had occasion to record a case of poisoning with strychnia, in which a lady lost her life by inadvertently taking a strong solution of strychnia which had been prescribed for her in mistake for the same medicine in a diluted state. The solution as prescribed consisted of four grains of strychnia dissolved in an ounce of water, and it was ordered to be taken at mealtimes in doses of five drops mixed with an ounce of water. The medicine was correctly dispensed and labelled; it was a colourless liquid in an ounce vial. The lady, before going to dinner, prepared a dose, and put it into a vial similar to that containing the strong solution, intending to take it while at the dinner-table; but accidentally, on leaving her dressing-room, she put the wrong bottle into her pocket, and the contents of this, containing four grains of strychnia, she poured into a glass and swallowed. This case was commented upon at the time by one of the medical journals, with the view of showing the unnecessary danger caused by the too prevalent practice of prescribing medicines in a concentrated form.

Another case, very similar to the foregoing, has just come under our notice, but happily in this instance it did not prove fatal. A gentleman who was in the habit of taking a teaspoonful, in water, of a mixture of sal-volatile and chloric ether, had also a prescription, in which a strong solution of strychnia, containing eight grains to the ounce, was ordered to be taken in doses of two drops. These medicines were made up in readiness for travelling, the bottles properly labelled, being enclosed in turned wooden cases. The gentleman, while staying at a London hotel, intending to take a dose of the chloric ether drops, by mistake took a teaspoonful of the strychnia solution, but immediately discovered what he had done by the bitter taste of the medicine, and, hastening to a neighbouring chemist, had the contents of his stomach ejected before serious mischief occurred.

Cases such as these, when they happen, cannot be too prominently brought under the notice of the medical profession as well as pharmaceutists. They may serve to show the tendency of adopting certain methods of prescribing as well as of dispensing medicines, and the knowledge thus acquired may enable us to guard against and prevent the occurrence of similar accidents in future.

In another part of this Journal will be found a paper by Baron Liebig, extracted from the 'Lancet,' on the alleged poisonous quality of beef-tea and extract of meat; and, although the object of the great German chemist in this communication is to dispel some erroneous conclusions which had been drawn

from experiments made by Dr. Kemmerich, he does not attempt to disguise the fact that even beef-tea, when highly concentrated in the form of extract of meat, may be easily administered to an injurious extent. But how much more is this the case with medicines! Substances which are comparatively harmless when diluted may be capable of readily destroying life when highly concentrated. The numerous additions which, of late years, have been made to our Materia Medica by the introduction of powerful chemical agents have tended greatly to increase the danger attending the use of concentrated medicines. The Legislature has recognized the necessity for requiring a greater amount of knowledge and experience in those who are engaged in dispensing medicines than was formerly considered to be sufficient, and new regulations are about to be imposed upon all those who deal in dangerous drugs, with the view of protecting the public from the injurious effects which might result from their careless or improper employment. It becomes, therefore, more than ever incumbent on all those who have the means of doing so to assist in furthering the object thus contemplated.

What is desired is, without diminishing the efficacy of medicines, to render their administration as free from danger to life or injury to health, arising from any accidental misuse, as possible.

It is very rarely that the efficacy of a medicine depends upon the state of concentration in which it exists when administered. Even in the form in which liquid medicines are prescribed they are often directed to be mixed with water when taken, and this method of prescribing has greatly increased of late years. This subject demands the very serious attention of medical men, for it is obvious that to the extent to which medicines are prescribed in a more concentrated form than is necessary the danger attending their use is increased. If it were possible to establish a fixed and uniform quantity as the dose by volume of all liquid medicines, leaving the strength to be adjusted according to the required effects, the greatest security would be provided against fatal accidents, for the quantity constituting a dose would never contain enough to produce poisonous effects.

We are far from thinking it would be possible completely to establish such a system, especially in the existing state of society and with the increasing tendency there is to diminish all unnecessary encumbrance to the means of moving easily and rapidly from place to place; but much, we are convinced, may be done in this direction, and it ought to be done as far as it is practicable. The apportioning out of doses of poisonous substances, such as strychnia, by drops, is an operation that ought never to be entrusted to unskilled hands; and it would surely be a wise regulation to make, that such medicines should never be supplied to patients in a concentrated state, or in any state in which dilution was required in taking them. Then, if the volume of a dose were fixed at half an ounce or an ounce, there would be no great probability of fatal accidents occurring in the use of such medicines.

But it is not only with a view to the prevention of accidental poisoning that it is important, as far as possible, to avoid supplying unduly concentrated medicines to the public; there is another ground upon which the prevailing practice may be equally deprecated, and that is, that the doses are thus very imperfectly adjusted. If the intended dose of strychnia is contained in two drops of a prescribed solution, a slight tremor of the hand or a failure of distinct vision might cause the dose to be doubled or trebled; besides which, the size of a drop varies with the kind of surface from which it falls. If medicines are thus administered haphazard, what becomes of therapeutics, for the physician hardly knows what his patient is taking?

The case we have referred to is certainly an extreme and unusual one, but the objection urged in that case applies in degree to others of more frequent

occurrence. The more concentrated a medicine is, and the smaller the volume of the dose, the greater is the liability to variation in the adjustment of the quantity to be taken.

There are thus two good grounds for avoiding the use of concentrated medicines, and for supplying to the public, whenever it is practicable, the remedies prescribed for the treatment of disease in the state in which they are intended to be administered, namely, in the first place, that the more concentrated medicines are the more dangerous agents, and are often capable of destroying life if ignorantly or carelessly administered; and, secondly, that variations in the adjustment of doses affect the quantities taken more seriously in highly concentrated than in diluted medicines.

THE SALE OF POISONS UNDER THE PHARMACY ACT OF 1868.

From communications we have received from various quarters, it appears that many of our readers are anxious to have the provisions of the new Pharmacy Act relating to the selling and dispensing of poisons set before them in a concise and explicit form, and we have endeavoured to meet their wishes in this respect, as far as the means hitherto provided will admit.

It is expected that through the provisions made in the first and second clauses of the Act, by which the Pharmaceutical Society, with the concurrence of the Privy Council, may make regulations, in addition to those specified in the Act, "as to the keeping, dispensing, and selling," of poisons, and, if necessary, may add to the list of poisons in the schedule, some new light may be thrown upon some of the requirements of the Act. In the absence of such further regulations it is not easy to define exactly what medicines are included in the category of scheduled poisons. For instance, is syrup of red poppies, as a preparation of poppies, to be labelled "poison"? Is any preparation containing a poisonous vegetable alkaloid to be subject to the regulations which apply to the alkaloid itself? Are solutions of emetic tartar and corrosive sublimate to be included in the same category with the solid substances? These are questions to which we hope that complete and satisfactory answers will be implied in the regulations which are now under consideration, and which will no doubt be shortly issued. At present we are unable to do more, with reference to such questions, than to recommend the exercise of common sense, and the observance of such precautions as may appear to conduce to the safety of the public.

In addition to questions relating to these somewhat intricate points, a question may possibly arise with reference to Apothecaries and Veterinary Surgeons. The 16th clause states that "nothing hereinbefore contained shall extend to or interfere with the *business* of any legally qualified Apothecary or any member of the Royal College of Veterinary Surgeons of Great Britain," etc., and it may be asked, what do the businesses of these two classes of men consist in, and does the retailing of drugs form part of either of them?

A question may also arise with reference to the regulations required to be observed by Veterinary Surgeons under the 17th clause, for no exception is there made on their behalf with regard to medicines that are dispensed by them or supplied to their patients. It would appear, therefore, that although Veterinary Surgeons may sell and dispense poisons according to the usages of their business, they must, in doing so, conform to all the requirements of the 17th clause.

Setting aside these questions then for the present, the broad features of the

measure affecting the sale and dispensing of poisons are simple and obvious enough.

No person is allowed "to sell or keep open shop for retailing, dispensing, or compounding poisons," unless he be registered under the Act, or be a legally qualified Apothecary or a member of the Royal College of Veterinary Surgeons of Great Britain, or unless the sale be made by a wholesale dealer in the ordinary course of wholesale dealing, or the poison be contained in a patent medicine.

The registered Chemist or Pharmacist is authorized to sell and dispense poisons, subject to certain regulations, and so also, within the limits of their respective businesses, are the Apothecary and Veterinary Surgeon.

There is a distinct provision that the Apothecary in supplying medicines to his patients is not required to make any registry of sale, or to use any poison labels, but there is no such provision made for the Veterinary Surgeon. Both the Apothecary and the Veterinary Surgeon, in selling any poison in the ordinary way of business, if this be within the sphere of their business, must conform to all the regulations of the 17th clause, in the same way as a registered Chemist and Druggist.

Wholesale dealers in exporting goods from Great Britain, and also in selling them by wholesale to retail dealers in the ordinary course of wholesale dealing, are not required to observe any of the regulations of the 17th clause, excepting those relating to the labelling of poisons with their proper names, and with the word "poison."

Registered Chemists or Pharmacists, and all others who are authorized to sell poisons by retail, are required to observe the following regulations :—

If the poison be included in the second part of schedule A, it must be distinctly labelled with the name of the article and the word poison, and with the name and address of the seller of the poison. This is all that is required to be done in reference to the sale of

Oxalic Acid,
Chloroform,
Belladonna and its preparations,
Essential oil of almonds, unless deprived of its prussic acid.
Opium and all preparations of opium or of poppies.

If the poison be included in the first part of schedule A, in addition to the foregoing requirements as to labelling, it is required, if the purchaser be unknown to the seller, that he should be introduced by some person known to the seller, and that before the delivery of the poison to the purchaser, entry be made in a book to be kept for that purpose, of the following particulars :—

The date of the sale.
The name and address of the purchaser.
The name and quantity of the article sold.
The purpose for which it was stated by the purchaser to be required.

And to these entries the signature of the purchaser, and of the person, if any, who introduced him, are to be affixed.

These regulations are to be observed in selling any of the following articles :—

Arsenic and its preparations.
Prussic acid.
Cyanides of potassium and all metallic cyanides.
Strychnine and all poisonous vegetable alkaloids and their salts.
Aconite and its preparations.

Emetic tartar.
Corrosive sublimate.
Cantharides.
Savin and its oil.
Ergot of rye and its preparations.

These are the regulations of the new Pharmacy Act relating to the sale of poisons, but it must be recollected that, in addition to these, all the provisions of the Sale of Arsenic Act still remain in force.

Several Poison Books for the registration of the sale of poisons under the Act have been issued by different publishers, and one of these, published by J. Davis, of Old Kent Road, purports to be an "Authorized Edition," from which it has been inferred that it has received the sanction of the Pharmaceutical Society. As it contains many errors, it may be well to state that neither the Society nor any of its officers have authorized the statement referred to. We have before us the 'Register for the Sale of Poisons,' by Mr. Mackay, of Edinburgh, which appears to have been well and carefully prepared.

There is a distinct provision for the dispensing of poisons by a registered Chemist or Pharmacist, which specifies that if any poison form part of the ingredients of a medicine dispensed by a person registered under the Act, it shall only be necessary to put the name and address of the seller upon it, and to make an entry of the ingredients, together with the name of the purchaser, in a book to be kept for that purpose.

Among the provisions of the Act there is one to the effect that any person who shall compound any medicines of the British Pharmacopœia, except according to the formularies of the said Pharmacopœia, shall, for every such offence, be liable to pay a penalty or sum of five pounds. This provision, however, applies only to medicines of the British Pharmacopœia, and does not preclude any person from making any preparation, not purporting to be a British Pharmacopœia preparation, in other ways. Thus, for instance, some persons may prefer the tincture of rhubarb of the London Pharmacopœia to that of the British Pharmacopœia, and a chemist may, of course, make the former and sell it, although he ought not to dispense it unless it be specifically ordered.

There is also a provision by which the "Act for preventing the Adulteration of articles of Food or Drink" are made to extend to all articles usually taken or sold as medicines, and any adulteration of any such article is to be deemed an admixture injurious to health; and any person registered under the Pharmacy Act, who sells any such article adulterated, is, unless the contrary shall be proved, to be deemed to have knowledge of such adulteration, and to be subject to the penalties imposed by that Act.

DOES THE NEW PHARMACY ACT PREVENT MEDICAL PRACTITIONERS SUPPLYING MEDICINES TO THEIR PATIENTS?

A great discussion has arisen as to the interpretation of those portions of the new Pharmacy Act which are said to affect the interests of medical practitioners who are not Licentiates of the Society of Apothecaries.

In framing the Bill which was introduced to the House of Commons in 1865, the Pharmaceutical Society proceeded on the principle that the safety of the public would be materially increased if qualified persons only were allowed to dispense medicines; they would not have interfered with the sale of drugs, and did not even propose to restrict poisons by direct enactment. Their opposition

to previous Poison Bills had been based on the non-introduction of what they deemed the only true safeguard—that which may be called, in the language of the present day, the "technical education" of the vendors,—the isolation of poisons in shops, the distinctive shaped bottles, the registration of sales, might all be good enough as adjuncts, but have been proved over and over again to be insufficient alone; sometimes even mischievous, by inducing carelessness as to the label. With such views it will readily be understood that the Bill of 1865, by restricting dispensing to proper hands would have ultimately, according to the opinion of its promoters, restricted the ordinary trade of chemists, and, therefore, have proved the best of Poison Bills. When the Committee of the House of Commons decided that the sale of poisons should be specially restricted, the Pharmaceutical Society bowed to that decision, still retaining and basing their new Bill on the proposition set forth in its preamble, that "*it is expedient for the safety of the public that persons keeping open shop for the retailing, dispensing, or compounding of poisons, and persons known as Chemists and Druggists, should possess a competent practical knowledge of their business.*"

It never entered the minds of these men to debar persons well qualified from the practice of pharmacy, and, therefore, in every Bill proposed by the Society a reservation of the customary rights of all "*duly qualified medical practitioners*" was provided. The very Bill which ultimately became an Act of Parliament contained these words when it passed from the House of Lords to the Commons. There unfortunately (with a view, we believe, to make its language more precise and parliamentary) the medical practitioner was, on the motion of Lord Robert Montagu, called an Apothecary. Hence the present difficulty, or, if not really a difficulty, at least a seeming one to those members of the medical profession who are acting as general practitioners without being Licentiates of the Society of Apothecaries.

Our contemporary, the 'Lancet,' in an able article on this subject,—being satisfied that an Apothecary may sell and compound poisons as heretofore, and even keep an open shop for such purposes,—endeavours to prove that a medical practitioner, who is not a Licentiate of the Society of Apothecaries, cannot even compound and supply the medicines necessary for his own patients, if they contain poison, and a specific charge be made for them. He says, the matter resolves itself into two questions, "*What constitutes a legally qualified Apothecary?*" and "*What constitutes selling?*"

We wish to consider these questions as we think any magistrate who may be called on judicially to consider them will, by bringing common sense to aid in interpreting the objects and provisions of the statute. An Apothecary is a person who dispenses medicine, and to make him legally qualified he must have authority from some examining and licensing body recognised by the "Medical Act." It is unnecessary to enumerate the various licensing bodies so recognized; they are described at length in schedule A of the Act itself, and all persons possessing their certificates are registered as having power to practise in the various branches of medical science. Surely those so authorized to practise medicine and pharmacy must be regarded as Apothecaries, and it would be beyond the power of the Pharmacy Act to deprive them of statutory rights without repealing the grant of those rights, even supposing for a moment that none save Licentiates of the Society of Apothecaries can be correctly described by the word "Apothecary." To give a man the power to practise medicine and then to limit his choice of medicines by forbidding him to use opium, prussic acid, or chloroform, would be a mere mockery.

And next to consider "*What constitutes selling?*" we will, to complete the question, add the words "*poisons under this Act.*" Selling any one of the articles pure and simple which are enumerated in schedule A. It may be objected

that the words "*its preparations*" follow some of the poisons. Quite true, and the preparations of those special articles are poisons to be dealt with as the simple substances. Thus if an unauthorized man sell tincture of opium, he is liable to a penalty. This is *selling*, whether there be an open shop or not, and is forbidden. There must be two consenting parties in a sale, the buyer and seller.

A medical man and his patient do not stand to each other in the relation of buyer and seller; they are employer and employed. The patient calls in a doctor to cure him, and consents to the use of prescribed means. What says the 31st section of the Medical Act?

"*Every person registered under this Act shall be entitled according to his qualification or qualifications to practise medicine or surgery, or medicine and surgery, as the case may be, and to demand and recover in any court of law, with full costs of suit, reasonable charges for professional aid, advice, and visits, and the cost of any medicines or other medical or surgical appliances rendered or supplied by him to his patients.*"

Our contemporary dismisses the question, "*What is an open shop?*" as a thing too well understood to need consideration. But as the "open shop" is the one condition set forth in the Pharmacy Act to make dispensing and compounding an offence, we must say a word or two about it. It must be remarked that it is nowhere said, "a person shall not dispense," but that he shall not "*keep open shop for dispensing or compounding.*"

If a man living in what externally seems to be a private house—no name or trade, no red lamp or bottle exposed to attract notice—undertook to dispense physicians' prescriptions, he would, in the eye of the law, be keeping an "open shop," because ordinary customers would resort to him for the purchase of medicine. A medical practitioner in his close "surgery" does nothing of the kind; if you apply there for laudanum, or even to have a prescription dispensed, you will fail in your object, as "the doctor only physics his own patients according to his own opinion of their requirements."

It is not for us to go into the question of Surgeons and Apothecaries keeping open shops. Our friend the 'Lancet,' always watchful of the privileges of the profession, is, at the same time, ever faithfully alive to its honour and dignity, and very properly discourages such unholy alliance. We are content with his efforts in that direction, and just as confident of his ultimate success as we are that in our own province the advance of pharmacy, and a consequent elevation and better remuneration of those who practise it, will in due time purge our chemists' shops of many "impurities" which are at present necessary adjuncts to secure even a decent maintenance.

Our object has been to show that we have heard nothing yet which shakes our opinion that legally qualified medical practitioners may, as heretofore, dispense medicines for their patients without fear of interruption, and we think we may, without violating confidence, assert that the same opinion is shared by the authorities in the Privy Council Office, who at least know with what object the change in phraseology was effected.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *November 4th*, 1868,

Present—Messrs. Bottle, Bourdas, Brady, Deane, Edwards, Evans, Haselden, Hills, Ince, Morson, Orridge, Sandford, Stoddart, and Williams.

The following Pharmaceutical Chemists were elected

MEMBERS.

Jones, Llewelyn Lloyd .....Buenos Ayres.
Wise, Walter .....Stow-on-the-Wold.
Griffiths, Alfred William .....London.

The following, having paid their arrears and their subscriptions for the current year, were restored to Membership :—

Hanbury, Cornelius .....London.
Mayhew, Thomas .....Waltham Abbey.

The sum of £20 was granted from the Benevolent Fund to a distressed Member of the Society in Yorkshire.

MODIFIED EXAMINATION, *November 6th*, 1868.

Present—Messrs. Bird, Cracknell, Darby, Davenport, Deane, Edwards, Evans, Gale, Garle, and Haselden.

Forty-three candidates presented themselves for Examination ; the following thirty-five passed, and were duly registered as

CHEMISTS AND DRUGGISTS.

Bailey, Isaac .....Lambeth.
Bates, Thomas William.....Bury St. Edmund's.
Blackburn, Henry James .....Cheltenham.
Bright, George .....Putney.
Brinsmead, Thomas James .....London.
Cannell, William .....Wolverhampton.
Clark, Joseph .....Great Driffield.
Coldwell, David Brainerd ..... Worthing.
Crocker, Stephen .....London.
Fowler, Philip Henry... .....Bacup.
Frobisher, Frederick .....Richmond, S.W.
Green, William Gunthorpe ....Ipswich.
Griggs, Edward Walter .....Bury St. Edmund's.
Haffenden, Thomas ....Brighton.
Hanson, Phillip Freeman .....Torquay.
Hardeman, John... .....London.
Hardy, George .....Malton.
Hewitt, Joseph Saunders ....London.
Jackson, John.....Bradford.
Lewis, John Hudson .....Cockermouth.
Loggin, Charles Frederick, jun. .....Stratford-on-Avon.
Mellor, William.....Worcester.
Parsons, William .....London.
Peacock, William Spencer.....London.
Ryder, John Edward .....London.
Saxton, Henry ....London.
Shackleton, George Wiliiam.....Ross, Hereford.

Smith, Henry .....Ipswich.
Spiers, William .....London.
Stebbing, Walter .....Litton, Norfolk.
Stevens, Felix.....Bristol.
Sweetman, John Merson .....Wigan.
Taylor, Arthur James .....Gloucester.
Thompson, James .....Workington.
Throssell, John .....Hitchin.

EXAMINATION, *November* 18*th*, 1868.

Present—Messrs. Bird, Carteighe, Cracknell, Darby, Davenport, Deane, Edwards, Evans, Gale, Garle, Hanbury, and Haselden.

Twenty-one Candidates presented themselves for Examination; the following twelve passed, and were duly registered:—

MAJOR (as Pharmaceutical Chemists).

Baissac, Eugène Jean Denis.....Mauritius.
*Marshall, Charles .....Harrogate.

MINOR (as Chemists and Druggists).

Andrews, John Knowles .....High Wycombe.
Blade, Edward .....Otley.
Fryer, Charles.....Guildford.
Hawkes, Richard .....Colchester.
†Manby, Walter Edward.....Southampton.
Neale, William James .....King's Lynn.
†Paine, Charles.....Usk.
Redpath, William .....London.
†Smith, John Barker .....Dulwich.
†Taylor, Henry Hylton ... .Middlesborough.

REGISTERED APPRENTICES AND STUDENTS.

Name.	Address.	
Boulton, George Edwin	Messrs. Rastrick and Son	Southsea.
Brooks, Charles, jun.	Mr. Brooks	London.
Brown, Arthur Mavor	Suffolk General Hospital	Bury St. Edmund's.
Calvert, Robert	Mr. Calvert	Stokesley.
Cook, Richard John	Messrs. Rastrick and Son	Southsea.
Cook, William Alfred	Mr. Langford	King's Lynn.
Cussons, Thomas T.	Mr. Carritt	Louth.
Deacon, Henry James	Mr. Deacon	Lower Norwood.
Dickenson, Christopher Charles.	Mr. Wearing	Lancaster.
Dunn, Frederick Edwin	Mr. Johnson	Uttoxeter.
Fowke, Robert Main	Mr. Woods	Worcester.
Habgood, Henry	Mr. Habgood	Wells, Somerset.
Imisson, James Richard	Mr. Faull	Bradford.
James, William George	Mr. Williams ...	Haverfordwest.
Jones, Hugh Ellis	Mr. Finch	Swansea.
Kershaw, Joseph Henry	Mr. Botham	Manchester.
Maitland, Alick	Mr. Maitland	London.
Osborne, James	Mrs. Baker	Ashbourne, Derbysh.
Payne, Ebenezer Stewart	Messrs. Harvey and Reynolds	Leeds.
Pearce, Richard	Messrs. Symons and Guy	Penzance.
Pearce, Thomas	Messrs. Pearse and Northey	Tavistock.
Raffle, William	Mr. Noble	South Shields.

* Passed in honours; eligible, at the end of the Session, to compete for the Pereira Medal.
† Passed in honours; eligible, at the end of the Session, to compete for the Prize of Books.

Ransford, William	Mr. Procter	Penzance.
Reeler, John William	Mr. Reeler	Cape Town.
Roberts, Richard Hughes	Mr. Hughes	Holyhead.
Saunders, Ernest Clement	Mr. Floyd	Bury St. Edmund's.
Stooke, Arthur	Mr. Chapman	Cleveden.
Sutton, William	Mr. Langman	Chatteris.
Taylor, Rowland	Mr. Taylor	Oxford.
Thompson, Alfred	Mr. Ballard	Faringdon.
Walker, Benjamin	Mr. Wilson	Sheffield.
Wing, Lewis	Mr. Murch	Torquay.

MODIFIED EXAMINATION, *November 25th*, 1868.

Present—Messrs. Bird, Carteighe, Cracknell, Darby, Davenport, Deane, Edwards, Evans, Gale, Garle, Hanbury, and Haselden.

Forty-six candidates presented themselves for Examination; the following thirty-one passed, and were duly registered as

CHEMISTS AND DRUGGISTS.

Baker, John Thomas	London.
Bardsley, William	London.
Beckett, Robert James	London.
Bowen, James	Deptford.
Carter, Thomas Wright	St. Alban's.
Cook, Edward Richard	London.
Crowe, Thomas Matthew	London.
Dixon, Walter Richard	London.
Dodd, William	London.
Frizell, Richard William	London.
Jewell, Robert Joseph	London.
Jones, Frank	Liverpool.
Jones, John Peace	Greenwich.
Kilkenny, Andrew	London.
Learmouth, Albert	London.
Mason, Henry Dutton	London.
Perkins, John Jaquest	Stafford.
Priest, Benjamin William	London.
Prince, Joseph Burgess	Wrexham.
Richardson, John	London.
Sellors, Thomas	Coventry.
Shaw, Charles	Brant Broughton.
Sillitoe, Frederick Sampson	Redhill.
Snape, Walter	London.
Spencer, Thomas	Osbournby.
Stewart, James	Bristol.
Sutcliffe, John Clarkson	Barnsley.
Tremeer, John Joseph	Barnstaple.
Trotman, Alfred Court	London.
Whales, Thomas	London.
Williams, Evan	London.

EXAMINATIONS IN EDINBURGH.

November 12th, 1868.

Present—Messrs. Ainslie, Aitken, Buchanan, Kemp, Mackay, and Young.

Six candidates presented themselves for the Major and Minor Examination; the following passed, and were duly registered.

MAJOR (registered as a Pharmaceutical Chemist).

Kerr, Charles.....Dundee.

MINOR (registered as Chemists and Druggists).

Baxter, James .....Grangemouth.
Gibson, Adam.....Dunfermline.
Murdoch, J. H. .....Bathgate.
Stephenson, Frederick .....Edinburgh.

REGISTERED APPRENTICE.

NAME.		ADDRESS.
Strang, Peter	Mr.	.....Perth.

MODIFIED EXAMINATION.

Seven candidates presented themselves for examination; the following passed, and were duly registered as

CHEMISTS AND DRUGGISTS.

Beattie, Thomas.....Langholm.
Hutchinson, John ..... Edinburgh.
Laidlaw, Walter.....Edinburgh.
Leith, Peter .....Rothesay.
Robertson, Andrew Graham.....Edinburgh.
Smith, John ....Kilmarnock.
Stewart, Andrew Brown .....Langholm.

MODIFIED EXAMINATION, *November 19th*, 1868.

Present—Messrs. Ainslie, Aitken, Buchanan, Kemp, Mackay, and Young.

Sixteen candidates presented themselves for examination; the following twelve passed, and were duly registered as

CHEMISTS AND DRUGGISTS.

Brydon, Thomas T. .....Edinburgh.
Cairncross, Hugh Lamont.....Edinburgh.
Davidson, Andrew .....Edinburgh.
Duncan, Joseph .....Edinburgh.
Gamley, David .....Edinburgh.
Leslie, James .....Edinburgh.
Paton, James .....Edinburgh.
Robertson, John.....Edinburgh.
Stewart, William Finnie .....Edinburgh.
Tod, David ....Edinburgh.
Walker, John.....Edinburgh.
Welsh, Thomas .....Edinburgh.

PHARMACEUTICAL MEETING.

Wednesday, November 4th, 1868.

MR. G. W. SANDFORD, PRESIDENT, IN THE CHAIR.

The Minutes of the previous Meeting having been read, the following

DONATIONS TO THE LIBRARY AND MUSEUM

were announced, and the thanks of the Meeting given to the respective donors thereof:—

Memorials of London and London Life in the thirteenth, fourteenth, and fifteenth centuries: from the Library Committee of the Corporation of the City of London,—University College Calendar for 1868–69: from University College,—The London Hos-

pital Pharmacopœia: from the Hospital,—Swedenborg's Principles of Chemistry: from Mr. W. Young,—Some Particulars of Alderman P. Malpas and Alderman Sir T. Cooke, K.B., Ancestors of Sir Francis Bacon (Lord Bacon) and Robert Cecil (first Earl of Salisbury). By B. B. Orridge: from the Author,—On Education as Illustrated by Medical Usages and Experiences. By W. A. Guy, M.B.: from the Author,—Note sur la Culture du Quinquina: from M. Soubeiran,—Wood of *Guaiacum officinale* from the Bahamas. The peculiar structure of this specimen is characteristic of the Bahama *Lignum vitæ:* presented by the Curator,—Root of *Psychotria emetica.* Out of a parcel recently offered for sale in London: presented by the Curator.

THE NEW PHARMACY ACT.

Mr. BLAND said that before the business of the evening was proceeded with he should like to ask a question of the Chairman. He supposed most of them had seen a report in the newspapers of a case of attempted suicide which came before Mr. Flowers at the Bow Street Police Court. In giving his judgment, Mr. Flowers took occasion to state that the Pharmacy Act, and particularly clause 17, which would very materially affect them as retailers, was already in force, and that if the party who had sold the red precipitate had been brought before him, he should have had no alternative but to have fined him £5. Now it appeared to him (the speaker) that, looking at the Act, and reading it in a common-sense way, no one would expect it to come into operation at all before the close of the present year; and further, that if it had been in operation, the person who sold the red precipitate had committed no infraction of the law, inasmuch as red precipitate was not one of the poisons named in the schedule of the Act. He should like to know, therefore, whether the legal advisers of the Society were prepared to express an opinion of the correctness or otherwise of Mr. Flowers's view of the matter. If that gentleman's ruling was correct, it was important for them at once to take steps to put themselves in a right position.

The CHAIRMAN observed, with reference to the latter point, that Mr. Flowers was undoubtedly wrong, inasmuch as red precipitate was not mentioned in the schedule as a poison. As to the time this Act came into operation, there were doubts. It had not been supposed that it would do so until the 1st of January next year.

Mr. Flowers held that it was already in force, and a second notice to that effect was given in the Bow Street Police Court report, in reply to some contradictory statements which had appeared in the newspapers. All he could say was this, he had been in communication with the Privy Council respecting it, and had received no very decided answer at present. It all depended upon the reading of the 15th clause. That clause said that after the 31st of December, 1868, any man who should fail to conform to such regulations as were made in pursuance of this Act should be liable to a penalty of £5; and it would altogether turn on the question whether a regulation made by the Act—the 17th clause—was a regulation made in pursuance of the Act. Let the matter be decided as it might, he thought they could all bring themselves into obedience to the Act at once. There was no difficulty in registering the sale of poisons, nor in labelling their articles "poison," according to the schedule. He apprehended that the greater portion of the articles mentioned in the schedule were already labelled "poison" by most chemists.

Mr. BLAND said he should be under some difficulty in this matter, because he should have to get a large quantity of labels printed. He should have to label paregoric lozenges "poison."

The CHAIRMAN would rather not express an opinion as to whether paregoric lozenges were poison, but in this particular he thought any chemist would be

quite safe till Christmas. He hoped this matter would be subject to regulation between the Pharmaceutical Society and the Privy Council.

Mr. BURDEN asked whether any discretion was given to a magistrate in regard to the amount of the penalty.

The CHAIRMAN said the penalty was not exceeding £5 for the first offence, and not exceeding £10 for the second.

REMARKS UPON TINCTURES.

BY A. F. HASELDEN.

Tinctures, as a subject for discussion, might seem, at the first blush, to have been exhausted; but, in addition to some experiences of my own, I have been reminded by two articles in the October number of the 'Pharmaceutical Journal' and one by Mr. Savage, read at the Bath meeting of the Conference, that such in reality is not the case. The tinctures contained in the Pharmacopœia make up, or form, a considerable and important portion of that book, and there are many others in use but not contained therein. From the nature of their component parts they rank among the costly portion of a pharmaceutist's stock-in-trade.

There are, I know, some, and there may be many, who hold the opinion that, as regards the Pharmacopœia preparations, the directions therein laid down, with respect, at least, to Galenicals, should be strictly followed, even when by a deviation a better product might result. Orthodox myself, I should be sorry to lead any astray, though they should be advantaged thereby; but there are some tinctures not necessarily Pharmacopœia property, and which may be prepared after one's own peculiar notions, provided such are not substituted for the Pharmacopœia articles. I may instance the tinctures of rhubarb, senna, *alias* "Daffy's Elixir," chamomile and ginger, orris root, musk seed, and essence of ginger, now introduced as strong tincture of ginger, and others. Some of these, as retail articles, have been prepared for years according to forms differing from those of the Pharmacopœia; and old customers, who have for years enjoyed tincture of rhubarb flavoured with liquorice and ginger instead of cardamoms and coriander, have a wish to be supplied with the same still, and I submit that I have a right to furnish them with that article, and to prepare it in such a way as I may think best and most advantageous. Many other similar cases might be pointed out, but one is sufficient for the purpose. I feel, therefore, that it may not be out of place to review the preparation of tinctures, and make such suggestions as may possibly be approved, although not necessarily carried out.

The gentlemen whose papers have reminded me of this work had evidently different objects in view. Mr. Savage's wish was to find out or prove the advantage of this or that mode of preparation over another, and to arrive at, or determine, the best by the amount of extractive contained in a given quantity of tincture. The value of this mode of proceeding, if fully and fairly carried out, can hardly be estimated as a matter of reference; but, to be worked successfully, each tincture should be prepared by the same person according to each recognized process, and from the same parcel of material. The extractive should be evaporated to dryness, and should, both before and after evaporation, be examined as to its constituents, as much aroma would in many cases be destroyed by desiccation; and also by long-continued maceration some ingredients would yield extractive not of an active or valuable nature, and much would depend upon other circumstances, namely, the amount and kind of pres-

sure employed after simple maceration, as also after maceration and displacement by the Pharmacopœia process; also whether, where percolation pure and simple was employed, the absorbed menstruum was recovered by pressure or by displacement with a similar menstruum or any other,—and all this should be performed more than once, and upon an equal quantity in each case, and not too small a quantity; for I have not much faith in experiments of this kind upon a very small scale. Now, this is a task from which most of us would, I fear, shrink.

Mr. W. Laird, in a paper read at the Conference recently held at Norwich, points to the specific gravity of a tincture as a ready means of testing its quality; and in the extreme case alluded to by him it was certainly the means of showing, as far as the strength of the spirit was concerned, which way the wind blew; but for general application many particulars must be considered. Should a tincture, for example, have a higher specific gravity than expected, it might be thought that the spirit used was too weak; whereas the fact might be that the amount of extractive was unusually large, and, *vice versâ*, the spirit might be considered stronger than required, while, in reality, the extractive was less abundant. Again, the age of a tincture should be considered, as all tinctures deposit more or less upon long standing, even after filtration; and in the shop, perhaps I should say pharmacy, where, during the long winter evenings, the heat from the gas is great, there is, even with well-stoppered bottles, a certain loss of spirit by gradual spontaneous evaporation; and in the same preparation, with the greatest care, the result will not ever be the same, although, as far as practicable, the quality of the substances acted upon is so. To more fully illustrate this I will give the result of several makings, at different distances of time, of one gallon of tincture of opium, made by the old process with the best opium dried and powdered: in one case 9 lbs. 4 oz. by weight of tincture, in others respectively 9 lbs. 1 oz., 8 lbs. 12 oz., 8 lbs. 13 oz., 8 lbs. 14 oz., 9 lbs. 2 oz., and 9 lbs., thus proving, though the difference is not very great, that, with every wish to produce a just and good thing, the same result cannot always be secured; therefore a certain latitude should be granted, and I should hesitate before I condemned a tincture in a general way upon the strength of its specific gravity alone. A word or two I may perhaps venture upon with regard to the taking of the specific gravity of tinctures. The temperature should have particular attention, as my own tinctures have, during the month of October, varied from 59° to 70° F. in the same situation and hour of the day; and it may be worth remembering that, whereas the London Pharmacopœia ordered specific gravities to be taken at a temperature of 62° F., the P. B. directs them to be taken at 60° F.; and this is an advantage, as the specific gravity bottles sold by the makers of them in England are and were adjusted or constructed at 60° F.

Dr. Walter G. Smith, in an article published in the October number of the 'Pharmaceutical Journal,' draws attention to the tinctures of catechu, kino, and rhatany, and suggests a mode of distinguishing between the three by a process which he admits involves greater difficulties than are apparent at first sight, and which will be best understood by those who have made similar attempts. Whilst fully acknowledging the value of his suggestions, I do not myself think that the result obtained by his mode of proceeding would practically, and in a general way, be to any extent available. Although it may be considered unscientific to say so, I would rather be guided in the estimation of a tincture by its generally known characters; I would prefer trusting to the senses of sight, taste, and smell, aided perhaps by specific gravity; and to any desirous of examining any potable tincture I should be inclined to say, with the itinerant vendor, taste and try before you buy.

The object, however, of this paper is not strictly in this direction, but thus

have I been reminded of that which has for some months and from time to time occupied my thoughts and attention, namely, whether the processes as given in the Pharmacopœia for the preparation of tinctures are the best that could be devised; whether in all cases they have been most judiciously selected; and whether in all or any an improvement could be made? If not in the actual process, I am quite satisfied that practically in the manipulation, something remains to be done. Every item or particular of manipulation could not, I am aware, be written in any book, any more than it would be possible to make all men avail themselves equally of the gifts bestowed by Providence and nature upon them. But to proceed: is the Pharmacopœia process of maceration and displacement, with subsequent pressure, a good process, and does it possess any advantage over maceration alone with pressure? In most cases, I believe,—and I speak from some experience,—it is a good, perhaps the best process that could have been devised, especially if, in addition to what I shall say presently, and as I have described in the fifth volume of the Pharmaceutical Journal, second series, page 442, it is carried out in one and the same vessel, acting both as a macerating vessel and displacement apparatus. There is then no loss by transference from one vessel to the other; the tincture is commenced, carried on to a certain extent, even to the pressing, in the same vessel and finished within a given time, so that there is no loss by evaporation, no chance of a portion being poured off for immediate use, thus disturbing the uniformity of the product by leaving the marc for pressure at a more convenient time. Is the process equally well adapted to all the cases in which it is ordered? I think not. For instance, tincture of capsicum, where the amount of solid matter to be operated upon is small, namely three-quarters of an ounce to the pint, can, like tincture of cantharides and compound tincture of lavender, be as well prepared by maceration alone with pressure; or better still, when required quickly, either of the three by the ordinary process of percolation, and for tincture of myrrh there can, I feel, be no improvement upon percolation. But whilst the Pharmacopœia recognizes percolation pure and simple as the best for the essence or strong tincture of ginger, it ignores it for tincture of ginger, where it might with equal advantage be adopted, particularly as the solid matter acted upon is comparatively small, and can without any difficulty be thoroughly exhausted by the spirit employed; or I may just propose that it may be equally well prepared by proportionately reducing the strong tincture. Would a longer period of maceration be advantageous in any case? For the tinctures of rhatany, senna, compound cardamoms, rhubarb, and gentian, I prefer six days to forty-eight hours, although a good tincture can be made with forty-eight hours' maceration, displacement, and pressure, if frequent agitation or stirring be attended to during the time allotted to maceration; for tincture of chiretta, maceration alone I believe more practicable than the compound process, but neither will entirely deprive the chiretta of its bitterness, at least by one application of the spirit menstruum. Can the process be improved, even where, at present, most successful? In practice, I feel, and may without presumption say, that I know it can, and in this way: in nearly all the tinctures there is always a certain loss of the menstruum by absorption, evaporation, or otherwise, in some more, some less. In cascarilla, rhubarb, orange, henbane, senna, and calumbo, the loss of fluid ranges from ten to twenty ounces in the gallon of tincture; and this loss the Pharmacopœia directs to be made up after the tincture is finished. Now, knowing by repeated observation how much each loses, instead of adding the menstruum at last, after the completion of the work and all products obtained, I pass that quantity, the usual amount of loss, also through the marc, thereby making all the spirit do its share of work, and thereby more fully ensuring the exhaustion of the ingredients. I shall, perhaps, be told that this is simply tantamount to employing more menstruum to the same quantity of material. True, to a

certain extent; but then I employ it in the best way, and yet only as much as I am fully justified in doing. Now, if this make-up quantity of fluid was added at the commencement of the macerating part of the process, I should not obtain the same result; the effect of percolating an extra ten, fifteen, or twenty ounces, as the case may be, through the ingredients now pretty well packed, does much more towards exhausting them and clearing off any adhering extractive, before pressing, than simply soaking them with the additional quantity of fluid during maceration. I can also, and do, in my apparatus press considerably, by means of weights placed on the material and within the vessel, before removing to be again pressed in the ordinary way. To continue: with compound tincture of cardamoms, the loss in bulk is very trifling, in consequence of the saccharine matter obtained from the raisins, and from the unabsorbing nature of the other ingredients. In some of the tinctures there is no loss in bulk, or rather the required quantity is obtained without any additional fluid; and these have been pointed out in the last edition of the B. P. In the tincture of hop, and simple and compound tincture of bark, the loss of the menstruum is often as much as sixteen and eighteen fluid ounces in the gallon; in the two bark tinctures, the quantity of solid matter to be acted upon being above the average,—the average being two and a half ounces to the pint, whereas in the compound tincture of bark it is $3\frac{1}{2}$ oz. + 90 grains or nearly $3\frac{3}{4}$ oz., and in the simple four ounces. In these particular cases I am satisfied that exhaustion does not take place usually, but that the passing of the additional liquid eventually required to make up the proper measure does materially help it; but in these two last, the simple, more effectually true percolation, if well performed, I consider a mode of proceeding superior to that of the Pharmacopœia, though I find the loss of spirit equal. It would be difficult to fix the loss experienced by all workers at exactly the same figure, because the larger the quantity prepared, and the more perfect and powerful the pressure employed, as in wholesale establishments, the less in proportion will be the loss; but in retail establishments of average capabilities I think I am not far wrong as to the amount I have stated. I had occasion very recently to make some commercial tincture of rhubarb after my own plan, and in the vessel before spoken of; and, as on former occasions, I had every reason to be satisfied with the quantity and quality of the product and the exhaustion of the marc. One word upon proof spirit and I have done. Five of spirit and three of water are the proportions by measure required; but when mixed and allowed to stand, as you all know, a perceptible diminution in bulk takes place. For instance, with five pints or one hundred ounces of spirit and three pints or sixty ounces of water, speaking in round numbers, there will be, at 60° F., a diminution in bulk amounting to four ounces; this should be made up either by water or spirit, provided the mixture retains the specific gravity of ·920. In other words, to be correct in the quantity of proof spirit used in making tinctures, it should not be mixed at the moment it is wanted, but should be kept ready for use. Although, to some minds, all that I have said may seem a very simple matter, I trust that I have shown that the spirit now simply ordered to be added may be more satisfactorily and usefully applied; that better products will result; and that the preparation of tinctures may still find food for discussion. Also, which perhaps is more important still, that by communicating freely with each other, and reporting our experiences, we do that which every true lover of his profession should and will do, and which no book could be expected to do for us.

Mr. Bland remarked, that a manufacturer who would bring out a tolerably efficient press at a moderate price, which would place it within the reach of ordinary retail pharmaceutists, would be very much entitled to their gratitude.

The common screw-press was a wretched affair, and led to an enormous loss of spirits.

The CHAIRMAN said he had always felt that the direction to add spirit after having pressed was wrong, because there was so much difference in the presses. One would use a strong press, and another a weak one, and perhaps use it very badly. He thought with Mr. Haselden that the spirit should be added and carried through the ingredients, and he had adopted this plan.

Dr. REDWOOD asked the Chairman if he did not find a little difficulty in adjusting the quantity in that way. Were they not liable to have a little too much?

The CHAIRMAN said to avoid that, after having found the quantity required, he would pass it through the ingredients before adding it to the clear tincture.

Dr. REDWOOD said that perhaps he might be allowed to make two or three remarks with reference to Mr. Haselden's communication. He would observe, with reference to what was looked upon as the British Pharmacopœia process for the preparation of tinctures, which was introduced in the first edition of the British Pharmacopœia, that in the first instance he was not entirely favourable to that process. It appeared to him to be a compromise between two processes—namely, maceration and displacement, that there was no advantage resulting from the association of the two, and that it would have been better to have taken one to the exclusion of the other, whichever was selected; but he must confess that the more experience he had had with reference to the working of the process the more he had become satisfied with it, and inclined to think that, for the purposes contemplated in the Pharmacopœia, it was, as regarded its general character, the best process that could be adopted. Of course there were cases where it was not fully applicable, and it was not introduced in cases of that description in the Pharmacopœia; but while he had very deliberately formed this opinion with reference to the process, looking at it in its general features, he was not at all prepared to say that the method of manipulation indicated in the Pharmacopœia was what he should consider to be the best method for carrying out the objects contemplated. He had on former occasions at the meetings of this Society represented his views upon that subject, and he entertained the same opinion as he had expressed on one or two former occasions. Mr. Haselden had before brought forward a form of apparatus of his own, and it was very natural that he should feel a little favourably disposed towards his own child. It so happened, however, that he (Professor Redwood) had a child of his own, and he, too, had a very strong feeling in favour of his own offspring. He had recommended an apparatus for the preparation of tinctures, by the use of which all the essential features of the British Pharmacopœia process could be fully carried out, and, as he believed, much more conveniently carried out than they could be by manipulating exactly in the way indicated in the Pharmacopœia. If it were asked, why the use of that apparatus was not indicated in the Pharmacopœia? his answer would probably be that he had not wished to force forward a method of his own in that way, and especially as it related to details of manipulation affecting the convenience of the operator rather than the quality of the product. He had therefore left the original process with only very slight modifications, knowing as he did then, and as he did still, that a large number of men of great practical experience in pharmacy, and in whose judgment he had very great confidence, were strongly in favour of that process, and considered it to be in every respect good and unobjectionable, as a general process, in the cases where it was directed to be used. He then explained the apparatus to which he alluded, and the method of using it, as described in the Pharmaceutical Journal, Vol. V. N. S. p. 542. He considered the process, if carried out in this way, a good and most appropriate process, as

a general process to be adopted in the Pharmacopœia, because a Pharmacopœia method for the production of any product should be one that could be successfully adopted by all those who were called upon to make the preparation, however varied their circumstances might be, or the amount of skill and experience which they might possess. He was of opinion that, however excellent the process of percolation was for some special purposes, and in skilled hands, it was not one that could be advantageously adopted as a general process to be introduced into the Pharmacopœia. It gave rise, in inexperienced hands, to more variable results than the old process of maceration; and if it were a question with him simply between percolation and maceration as a Pharmacopœia process, to be carried out by the druggists throughout the country, he would rather take the old process of maceration. But he considered the process he had described did not entail those difficulties of manipulation which were involved in the process of percolation, pure and simple. It had the advantage, also, that it obviated the objection attaching to the old process of maceration in the time involved, and it met the general requirements of the trade.

Mr. Haselden said that, to a certain extent, Dr. Redwood seemed to have misunderstood him. He admitted that in some cases the Pharmacopœia process was the best; but in some cases he thought percolation was the best. The process recommended by Dr. Redwood was a very good one, perhaps better than his own, because they could carry it out in a stone jar; wherever they had a wide mouth they could put in the bag with the ingredients. He thought, however, when they came to find out how much spirit they lost, they would be advantaged by percolation.

Dr. Attfield would like to make two or three remarks on this subject from the point of view of research, and not from what was, by a curious perversion of language, called the more practical, the manufacturing point of view; and in doing so he did not think that he need offer any apology, because he considered that a subject like this was one of the very best that could occupy the attention of Pharmaceutists. Mr. Haselden, in the first few paragraphs of his paper, seemed to give some sort of apology, as many other gentlemen had done when reading papers before the Society, or publishing them in the Journal, for proposing to discuss processes different from those which were already given in the Pharmacopœia. He (Dr. Attfield) supposed that no one reading the accounts of these papers in the Journal would think, for one moment, that any suggestions were given for deviating from the principles which were laid down in the Pharmacopœia. What he thought was intended by the workers in this line of research, and by the authors of papers like that before them, was that their remarks should not influence the processes of the present Pharmacopœia, but those of future editions. To come from these general remarks to more special ones concerning the subject in hand, he would observe that Mr. Haselden had referred to papers or notes by Mr. Laird and Mr. Savage, the former of whom mentioned the specific gravity of tinctures as being a good indication of their value. But he (Dr. Attfield) did not take it that he put that forward as the only indication of their value. Mr. Savage had recommended, not for the first time by any means, the evaporation of a given quantity of tincture, so as to ascertain the weight of solid residue, as one means of estimating the value of tinctures; but he, too, so far as he (Dr. Attfield) remembered, would not recommend that as the sole means of estimating the value of the tincture. And then Mr. Haselden, though he thought they should "taste and try" before they bought, surely would not suggest that they should look at, and smell and taste the tincture with the view of determining its value. The only way of getting at the value of tinctures, when they did not know their active principles, was to adopt all these processes; and before they could say of any one tincture that it was as good as it could be made, they should taste and smell, and also estimate

the amount of solid matter in a weighed quantity of the liquid; and, in addition, take its specific gravity. That remained to be done for fully one-half of the tinctures that were now given in the Pharmacopœia, so that there was no lack of work for those who chose to take up this subject.

Mr. BURDEN remarked that Dr. Redwood had not told them what was the condition of the ingredients when they were put into the apparatus he had described, and he should like to know whether the cylinder was thrust in whilst the bag was full of ingredients. He should be glad to hear what practical men who had to sell these things had to say with reference to Dr. Redwood's apparatus. From the little experience he had had, he was of opinion that percolation was certainly the most perfect process for the generality of tinctures in the Pharmacopœia; but it required a great deal of care, and much time was occupied in preparing and manipulating the ingredients. It appeared to him that the standing for forty-eight hours, ordered in the B. P., was in order that certain extractive matter should be dissolved and softened, and it was necessary they should know how long it took to soften the extractive matter in the ingredients. Mr. Haselden spoke very truly of the necessity to pass the remaining 25 per cent. through the ingredients; but he had found that, in many instances, there was no necessity to pass through 25 per cent. of the spirit at all, that the extractive matter was all got out. With regard to tincture of opium, he had prepared that by percolation, and it was one of the most troublesome tinctures they had to deal with. A large amount of extractive matter, especially if the opium was good, soon stopped the way, so that the spirit would not pass through. In that case, he had tried a large quantity of sand, and by gradually putting a certain portion, about an inch in depth, and so adding inch by inch he had gradually been enabled to get the spirit to pass through in the course of forty-eight hours. If they put all into the percolator at once, they would not get it through if the opium were good. The difference in the contraction of the spirit also made a difference in the loss, the quantity of which was generally from 15 to 20 ounces per gallon.

The CHAIRMAN thought the Pharmacopœia process would be improved, if instead of taking 75 per cent. of the spirit for maceration, they took 25 per cent., and then passed the other 75 per cent. through. That would give more perfect percolation and displacement.

Dr. REDWOOD thought the proposed alterations would only complicate without improving what the Pharmacopœia indicates in reference to quantities of spirit. The Pharmacopœia indicated the conditions in which the solid ingredients were to be used.

ON THE DETECTION OF PHOSPHATE OF LIME IN SUBNITRATE OF BISMUTH.

BY MR. G. G. HORNSBY.

I was not in time for the September issue of the Journal, or I should have sent some remarks on the "Note on a New Adulteration of Subnitrate of Bismuth," by Dr. Redwood. I am glad, however, to find that Messrs. Howard and Sons have pointed out (what I had previously proved by careful experiment) that this test, suggested by Mr. Roussin and supplemented by Dr. Redwood, for the detection of phosphate of lime, was fallacious. This point established, I have somewhat to say upon the modification suggested by Messrs. Howard and Son.

The process they suggest possesses some advantages over that of Mr. Roussin, but cannot, *per se*, be relied upon, as the following results will show. I have operated upon several samples as follows:—

1st. One part of the salt of bismuth, dissolved in nitric acid moderately dilute, two parts citric acid, dissolved in a little water; then add an excess of ammonia, and *boil*. This solution remains perfectly clear until it is boiled, but when it reaches the boiling-point it lets fall a bulky basic precipitate, which remains insoluble until the solution has been boiled for some minutes longer; it then parts with its ammonia, assumes a slightly acid condition, when the precipitate redissolves and remains perfectly bright.

2nd. Proceeded as above, adding two grains of phosphate of lime to the bismuth salt previous to solution. The result was similar to the above, with this exception: the precipitate redissolved, but left the solution somewhat opalescent, and, after the lapse of twelve or fourteen hours, gave an abundant, insoluble basic precipitate. Not satisfied with the result of these experiments, I adopted the same method again with two more samples, this time omitting the boiling altogether.

1st. As No. 1 before named, not boiled.

2nd. As No. 2; two grains phosphate of lime added; not boiled. The first solution remained perfectly clear, and has done so for many days. The second, after the lapse of five or ten minutes, gave a bulky insoluble basic precipitate. I have also dissolved "metallic bismuth," passing it through the same process; and, whether boiled or otherwise, the results have been the same in each instance as detailed above.

I have carefully examined the precipitates formed, and produced a considerable bead of metallic bismuth before the blowpipe, whether phosphate of lime has been added or not. The natural conclusion to be arrived at is this, that whilst the modification suggested by Messrs. Howard and Sons may serve as a kind of negative test in the cold, it cannot be relied upon as an absolute test, and especially not when the solution is boiled; although it may serve to show the presence of a phosphate, it is open to the same objection as that suggested by Mr. Roussin.

I have found in all my experiments with this most eccentric of metals that it will not bear boiling in the presence of free ammonia; even the Pharmacopœia liquor, and others which have come under my notice, give this same basic change when boiled with this agent in excess.

There is a question growing out of this well worthy the careful examination of experimenters, viz. does the salt of bismuth undergo a change when boiled in the presence of phosphate of lime and nitric and citric acids, producing an insoluble phosphate of bismuth? Phosphate of bismuth we know is not soluble in acetic acid, but freely so in dilute hydrochloric acid. These precipitates produced by the above-enumerated process correspond to this; but I have had no time to pursue them further, and should be glad to see the subject investigated by more able hands.

This subject is an important one, from the fact that manufacturers and wholesale houses may be exposed to unjust imputations, through hasty experimenters calling the precipitate produced by Mr. Roussin's and Messrs. Howard's test phosphate of lime, and estimating the percentage as such, when none exists in the salt. And the more especially is it important that great care should be exercised, as it appears that this adulteration is one of foreign origin, and the possession of drugs thus adulterated renders the possessor liable to a heavy penalty.

It would not, therefore, be policy for any one to rely upon a simple test which is in itself fallacious; and it would be well if we could have some more ready method of detecting this adulteration than the tedious, yet more reliable, one which already exists.

Our daily high-pressure hard work precludes the majority of us from bestowing that attention to these necessary details of examination of the materials we

use, which, from the great competition in the markets, renders it necessary that we watch to see if our preparations are carefully prepared, and really what they profess to be.

27, *Upper Rock Gardens, Brighton, Sept. 15th*, 1868.

PURE METALLIC BISMUTH.

Mr. Wood directed the attention of the meeting to a specimen of bismuth. There had, he said, been some discussion in the 'Pharmaceutical Journal' relative to the difficulty of obtaining pure bismuth, and he had there a specimen of chemically pure bismuth, prepared by Johnson and Matthey, which was exhibited at the Dublin Exhibition in 1865, and again at the Paris Exhibition. Although there was no demand for it at present, Johnson and Matthey were enabled, and would undertake to prepare it and supply it regularly for commercial purposes, if desired.

THE SANDFORD TESTIMONIAL FUND.

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N.B.—Donations may be made payable to the Treasurer, Mr. B. B. ORRIDGE, or to ELIAS BREMRIDGE, 17, Bloomsbury Square, W.C., London.

The Hon. Secs. request the Members of the Committee and the Local Secretaries to send their lists to London by the 18th of December. Up to this time only two or three have been received.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.

EDINBURGH MEETING.

The First Meeting for session 1868–69 of the Pharmaceutical Society of Great Britain was held in St. George's Hall, 119, George Street, on Wednesday evening, October 28th, Mr. W. AINSLIE presiding. There was a large attendance.

The CHAIRMAN, in introducing the business, said,—The Council of this branch of our Society having again honoured me by soliciting my acceptance of the presidential chair, I cannot occupy it without first thanking you for the confidence thus implied and the honour conferred. I shall endeavour, at all times, to have the best interests of the Society at heart; and in all that can promote its prosperity I feel assured I shall have the efficient co-operation of my friends in the Council. I wish to make my remarks as speedy and concise as possible, as the subject upon which our Honorary Secretary is to address us is of such an important and interesting character. We must all feel that the passing of the Amended Pharmacy Act is a matter of congratulation, not only to pharmaceutists, but to the public generally, because by its enactments, in future, no one can occupy the position of a chemist and druggist who has not been tested by examination as to his fitness for the responsible duties devolving upon him. It is well known that hitherto there was no barrier to even a comparatively uneducated man compounding medicines; and all our pharmaceutical education being of a voluntary nature, greater merit is due to those pharmaciens who have distinguished themselves by their scientific attainments. There are several subjects upon which I should like to make a few observations, and amongst these the relation existing between the medical profession and our body. We owe each a duty to the other; and I think it is most emphatically the duty of the Faculty to confine their recipes to the formulæ of the national Pharmacopœia; or, where medicines of their own suggesting are wished, a complete recipe should be written out for the guidance of the chemist. On a recent occasion, one of the leading chemists in an English city expressed himself to me very warmly with regard to the annoyance he was subject to by some Scotch as well as English prescriptions *being* the peculiarity of certain physicians, and which could only be obtained at certain establishments. Such transactions he characterized as being unworthy the members of so noble a profession,

and I entirely agree with him. It is more than provoking to have a customer present a receipt which can only be dispensed by those who have a private understanding with the physician, thus leading to a want of confidence in those who have not made this previous arrangement. The grievance of having our oldest customers forcibly sent past us to a favourite establishment of the doctor's most of us have felt acutely. Why not let the patients go where they please? providing always there is nothing against the character of the establishment they patronize. On the other hand, it is *our* duty to dispense with promptitude and accuracy every prescription entrusted to our care, and to carry out to the fullest extent the instructions of the practitioner. These remarks are peculiarly suited to Scotland, as I am well aware the surgeons in England dispense their own medicines, thus leaving the chemists there a very inferior kind of trade, and depriving them of the necessity of cultivating the scientific part of their profession. If the surgeons in England allowed their prescriptions to be dispensed by the chemist, we should have fewer complaints of that counter-practice which encroaches so much on the domain of the physician, and which our Society has endeavoured by every means in its power to counteract. I cannot close without urging upon our young men the increased necessity for study and close application, now that examination is imperative, and more liberal acquirements expected. I am glad to find the use of the library is increased, and trust that the demand for books will go on increasing, as several important works have been added from time to time. Your time will not permit me to revert to the successful Conference at Norwich, the pleasing report of which you must have seen in the Journal. To conclude, I trust that each of our meetings will be as well attended as this, and that there will be numerous competitors for the prize it is my privilege as President to bestow. I beg to direct your attention to specimens of the Beberu-nut presented by Messrs. J. F. Macfarlane and Co. of this city, and to the new books lying on the table.

Mr. John Mackay, F.C.S., read a paper, entitled, "Some Remarks on 'An Act to Regulate the Sale of Poisons, and to Amend the Pharmacy Act of 1852,'" which he introduced in the following manner:—There is no perfection to be found in anything under the sun, and thus it is, I presume, that, notwithstanding months and years of labour and anxiety, spent in connection with pharmaceutical legislation, the recent Act of Parliament, now so soon to come into operation, has not given universal satisfaction. The reasons to be assigned for this are chiefly two. The first may be considered as arising from a difficulty in understanding aright some of the clauses and provisions of the Bill; while the other may be named as arising from some of the details not being altogether palatable to a few of those who are interested in the future operation of the new Act. To allay in some measure the fears of many, and to make, if possible, some of the rough places smooth, it has been suggested that I might offer to this Society a few remarks on the present position and future working of what will, in time to come, be recognized as "The Sale of Poisons Bill and Pharmacy Act of 1868." I must, therefore, crave your indulgence while I proceed in my remarks, premising that in the event of my having overlooked any important feature of the Bill, an opportunity will be afforded at the close to ask for any additional information. I may also state that throughout several weeks past I have received a very considerable number of inquiries from parties both in town and country, and these have served to show me how numerous and wide the differences are in regard to the interpretation of some of the clauses in the Bill about to be considered. Thus, one assistant writes in great fear, and expresses himself with considerable force, as smarting under what he conceives to be a gross injustice, because, having served a regular apprenticeship, and thereafter entered upon an assistant's situation, this very obnoxious law will prevent his continuing to dispense medicines, simply because he will not reach his twenty-first birthday for a few months to come. It is true, he adds, that he believes he may, after he reaches twenty-one, make application to undergo an examination, but then he fears his ability to pass even the Minor one, and therefore he sees nothing for it but to throw "physic to the dogs," leave the business he was educated in, and look for employment elsewhere. I need scarcely say that such fears are entirely groundless, and that our young friend has raised a shadow which can very soon be set aside. The Act itself does not contemplate such a state of matters, and no expression in it can warrant such a conclusion. No reasonable individual can, however, wonder or object (though Government will not disturb any one while he continues to labour as an assistant) that

the same protective and legislative power should determine and exact, on behalf of the public interest, that the assistant ought, before he became proprietor and head of a dispensing establishment, to give unmistakable evidence of qualification and fitness to fill such a responsible position in society. This is all the length the law will, or at the present can go; and, as the master is entirely responsible for the proceedings and actings of both apprentices and assistants, it remains with him to be satisfied with the attainments of those who are allowed to dispense prescriptions and vend drugs as well as their various compounds. In what follows, it is not my intention to go through this new Act line by line. I am the more disinclined to do this, because a good deal has already been said about the Bill generally in other quarters, and because several of the clauses are so plainly and distinctly expressed that no one can mistake their meaning. Any statement, however, implying a doubt, or which can bear misconstruction, will be referred to, and explained as judiciously and concisely as I can. And now, at the very outset, let me carry you back for a few years, throughout which the war of pharmaceutical legislation has waged fiercest and strongest. For a moment glance with me at that meeting of earnest men who, in 1841, assembled together for the foundation of our now well-known and prosperous association. Let me, however, specially single out that noble and heroic man, Jacob Bell, who for many years stood so boldly and fearlessly at the helm of our newly-launched vessel, and whose untiring energy, whose varied talents, whose constant assiduity, whose unflinching determination, whose unceasing exertions, whose far-seeing confidence, whose princely munificence carried us safely over so many stormy and boisterous seasons, and to whose care, courage, and good sense we owed the safe, though imperfect, anchorage which he gained for us by the statute of 1852. Any society may well feel proud of a leader who, by dint of sheer talent and perseverance, gains for that society both a position and a name, and who, in addition to these labours, fights his way into Parliament, and even there makes himself heard in earnest appeals on behalf of what was to be the watchword and foundation of the Society for which he so industriously toiled, viz. increased pharmaceutical education. I repeat, when such a man has lived and died, we may well admire his wonderful career, and lament that he was so soon removed from the sphere of successful labour and increasing usefulness. Can it be questioned that, had God in his Providence spared Jacob Bell to the present hour, he would not have hailed with intense delight the success which has now placed pharmaceutical legislation on so fair a footing by the passing of the Pharmacy Act of 1860? All honour to his memory! and long, long may his well-known name, read by the light of his unwearied exertions, prove a beacon light, ever bright and ever enduring, leading others to follow that course which endeared him to all who came within the charmed circle of his acquaintance, and a recollection of whose many virtues has done so much to enshrine his memory in the hearts of many who have endeavoured, though perhaps feebly, to follow on his track. After giving a clear and lucid exposition of the different clauses of the Bill, and having explained the future operation of the Act generally, Mr. Mackay concluded as follows:—Such are the leading features of the Pharmacy Act of 1868, which many look upon as involving a certain degree of hardship and injustice, chiefly because it insists on compulsory education as a qualification. It is undeniable that there are some cases in the country which deserve our sympathy. One young man called upon me lately, who was living as an assistant with a chemist and druggist, in a town having a population of about 20,000, and asked me how he could ever qualify himself for examination. I replied, by reading elementary works and studying the different branches required. His answer was, "I possess no books of my own, while in the shop there is not a work on botany or chemistry even for reference." Now, such a case, I doubt not, is a very exceptional one, and whether it be so or not, aids us with a most powerful argument that the sooner such a state of things comes to an end the better. I am satisfied that nothing short of compulsion, under such an Act as the one so recently obtained, can place the chemist and druggist in the educated position he is entitled to occupy. Comparisons are sometimes neither advisable nor pleasant; but look for an instant at the Continent, where some of the most eminent and skilled scientific chemists have been dispensing druggists. There the onerous task of dispensing is really looked upon as a profession, and perhaps the best evidence I can offer of the real status of the pharmacien abroad is, to give the following extract from an address delivered some years ago to this Society by Professor Christison, in which he says, "When I repaired to Paris, to study practically the higher branches of chemistry,

my adviser there, the late eminent physiologist, Dr. Edwards, recommended, to my surprise and curiosity, that I should place myself under the tuition of a chemist and druggist. My surprise ceased when I found that I was to have for my teacher, under that designation, the late amiable, inventive, scientific Roubiquet. His dwelling communicated with his *boutique*, or shop, where he superintended an extensive dispensing establishment, with his *laboratoire*, or chemist's laboratory, which consisted of three apartments—one for his junior practical pupils, one for the senior, and a sanctum for the chemical philosopher himself. Here, in the immediate contact with the ordinary routine of trade, were carried on, with unwearied enthusiasm, those scientific researches into the proximate constitution of vegetable and animal substances, and into the nature and properties of their constituent proximate principles, by which the name of Roubiquet will be ever distinguished among the earliest and most successful cultivators of this important branch of chemical science." Now, though it may be doubtful whether existing chemists and druggists in Great Britain may live to see such a change, it is undoubted that the heavy clouds which have for so long shrouded and obscured pharmaceutical education are gradually but surely breaking, and that the sun of progression is already commencing to gild with its bright and gladdening rays our scientific horizon, until, ere long, dulness and darkness will be entirely dispelled under the brightening effect of the full orb of pharmaceutical chemistry, thus giving position and power throughout the whole range of pharmaceutical science. But if it be true that we are thus, on the one hand, to have increased power and position, we must never forget that with these come increased responsibility, and that, according as we now conduct ourselves, we may hope to gain the confidence of the public, the respect of the medical colleges, and the satisfaction of knowing that years of labour have not been spent in vain, but have at length culminated in that recognition for which many, living and dead, have worked with an earnest desire, not only for the present good, but also for the future welfare of all those who have or may yet devote themselves to the study of pharmaceutic matters.

At the close of the address a number of questions were then put to Mr. Mackay in regard to the clause preventing surgeons in Scotland and throughout Great Britain dispensing any medicines containing the poisons mentioned in the schedule. Several of the members considered that this was a hardship, more especially in regard to medical practitioners situated in country districts, who will thereby be prevented from dispensing their own medicines. It was argued by others that, as the surgeon was educated for a position above that of the chemist and druggist, he ought to maintain that position, and not interfere with the business of the chemist and druggist. Mr. Mackay also stated that, although the Bill undoubtedly contained one or two objectionable points, yet, on the whole, it was a good measure, and a very great step in advance. There were a great many provisions of the Bill in regard to which the pharmaceutists would require to use their own discretion and judgment.

Votes of thanks to the Chairman and Mr. Mackay terminated the proceedings.

PROVINCIAL TRANSACTIONS.

LIVERPOOL CHEMISTS' ASSOCIATION.

Twentieth Session.—First General Meeting, held October 15th, 1868; the newly elected President, Mr. J. F. Robinson, in the chair.

Messrs. A. H. Samuel and W. Harris were elected members of the Association.

The Secretary announced a donation to the Library of—'Remarks on the French Codex, and Companion to the Medicine Chest,' by Mr. Haselden, for which thanks were voted to the donor.

Mr. Murphy complained of the illiberality of the Liverpool Town Council in refusing to have analyses made of the water supplied to the town, although vast sums were spent in other ways. He described the water supplied at present as being very irregular in quality.

Mr. Abraham thought the Town Council could scarcely be expected to take action in the matter, in the absence of complaint as to the quality of the water.

The PRESIDENT said that complaint had been made, and that considering the prevalence of fever in Bootle, it was their duty to see that the water was of good quality.

The PRESIDENT then read the Inaugural Address, in the course of which he made the following observations:—

Everywhere we see the competitive principle of examination, as to a man's fitness for a post of trust or emolument, prevailing; everywhere we see great inquiry, and, in fact, a revolution in the ideas of education. There is a growing desire to cultivate, to a greater extent, the study of the natural sciences in preference to that exclusive reliance on classics and mathematics as the only mental calisthenics, and if this be so in old Universities, in public schools, ought we to escape? The answer is the Act of Parliament of last Session, rendering compulsory in future that every one calling himself chemist and druggist, every one aspiring to be a dispenser of medicines, must give evidence of his fitness for that post by undergoing an examination.

Whether we all rejoice at this or not, we all must respect a fact, and our duty is to look it boldly in the face, brace ourselves up, and quit ourselves in the emergency like men. It does not come within the scope of this address to enter into an explanation of the character of the examinations, which are of two kinds, more especially as this has been so fully done in the recent numbers of the Pharmaceutical Journal, and the article in last month's, entitled, "The Dread of Examination," is so good, and one calculated so completely to remove the fears of a class of young men, assistants, who might think themselves hardly used, that I hope every one of you who have not read it will do so. My purpose is to state what your Society has done, recognizing the altered state of affairs to meet the emergency.

This has engaged the most serious attention of your Council, who felt they would not be discharging their duty if they did not provide thoroughly efficient means by which its members might be fitted to fulfil the requirements of the Legislature. They have therefore made arrangements, so that in addition to the Chemical Class, conducted by Mr. Davies, F.C.S., and Lecturer on Experimental Physics at Queen's College, which will be held on Tuesday evenings from seven to nine o'clock,—there will also be classes for the study of Materia Medica and Pharmacy and Botany, conducted by W. Carter, M.B., B.Sc., F.R.C.S.I., Lecturer on Botany and Zoology at Queen's College, on Monday evenings. These classes will be conducted not only to the scientific training of the student, but also to the requirements of the Major Examination of the Pharmaceutical Society.

We have thus provided the means and appliances; you must do the rest. Let me say a word or two on this point, and bear with me while saying it. I would remind the masters who are released from the necessity of passing the ordeal of examination, by that respect for vested rights inherent in all British legislation, how much they can do in clearing the way for assistants and apprentices to attend these classes, and in stimulating them to undertake at once and in right earnest the task of self-education and training requisite. Some self-denial will be required of them to do this, but I feel confident it will not be wanting. I would here say a word or two, though perhaps I am wandering from my province, on a subject that will come up more and more by-and-by, and that is, the long hours of business custom and habit have imposed upon the trade. I say custom and habit, because my experience—extending over twenty years of personal observation of nearly all businesses, from Birmingham to Newcastle, from Hull to Whitehaven, embracing all hours of closing, as early as seven P.M., and none so late as those in vogue in this town, and much discussion on this subject with the principals of these businesses—has convinced me that while a general rule, or time to close, cannot be uniform or enforced on all without special cases of injury, and that even in different quarters of the same town, different habits of a population prevail,—still, that the public do not require this at your hands, do not value you one jot the more for it, that it is entirely unnecessary, and only requires grappling firmly with to convince any one of the fact. I venture to say this much, for I have but little hope of much good coming out of the private studies of youths, whose hours of business reach from eight in the morning till ten in the evening.

To the youths of our body I can only speak in terms of the sincerest congratulation on the prospect before them. I believe the future of the young chemist and druggist of to-day is bright with promise, and the Act just passed he will find of unmixed good to him, making his trade into a profession, and throwing into his daily drudgery some of

that love that the artist has in his work and the physician and surgeon in theirs. Take the case of the majority of our apprentices. Leaving school at the age of fourteen, with only a smattering of many things, no thorough knowledge of one,—the systematic training now requisite, the necessary application of the mind to such an exact science as chemistry, as positive as mathematics,—to such facts as those contained in botany, materia medica, and pharmacy,—is of incalculable value, developing and disciplining his mental powers and widening the sphere of his observation, making life more full and varied, and nature rich in objects of interest. His capacity for business, too, is increased with his love of it, and he finds indeed that knowledge is power. I would urge upon each of them the wisdom of promptitude in this matter to avail themselves at once of the means opened for them. It is not by violent or spasmodic efforts at cramming during the last six months of their apprenticeship, or looking forward to its close and a year at the laboratory and for study, that they will achieve their end, or that the purpose of the Legislature or the Pharmaceutical Society attained. It has been well said, "Much knowledge cast hurriedly into the mind smothers the young intellect, as too much fuel smothers scarcely-kindled fire." It is the quiet, patient application week by week, the little-by-little long persevered in, that lays the foundation and forms the habits by which, and on which, real permanent success and efficiency are achieved. I do hope this appeal will not be made in vain, and I answer for all the older members of this Society, that their hearty co-operation and assistance only await a claim.

Your Society has, during the past session, freely discussed the whole system of our weights and measures in relation to those of our Continental friends, an admirable paper by our Secretary forming the text; and the general feeling was decidedly in favour of supporting heartily a uniform standard, and that of France appeared to them based on the most scientific principle and most easy of application. Without committing your Society in any way, or alluding to it as it bears on its more immediate experience in pharmacy, but simply stating a commercial fact, I say for myself the present state of affairs is an unmixed nuisance, a perfect clog on all large Continental business relations, a plenteous source of loss of time, money, and temper. I may mention the fact that, during the last month, three instances of mistakes in tares and calculations of invoices, arising out of the different values of Prussian and English pounds and the reduction of kilograms, have come under my immediate notice, in which the sum of £40 in all had to be returned after much correspondence, bickering, and heartburning. As men of business, you are well aware it is not the pecuniary amount that is of the most importance, but these unpleasant feelings so induced, engendering reluctance to have further dealings in the same quarter; and as, year by year, our commerce bridges the seas, and connects Europe more intimately together, so does this nuisance intensify, and I do hope that ere long we shall have the difficulties that prevent legislation cleared away, and I trust we shall be found ready, as a Society, to aid other societies in their efforts to this end.

Gentlemen, I must bring my somewhat discursive address to a close. The session is inaugurated. Our schools, our professors are ready and willing. I trust the pupils will be found so likewise. During the last session we had papers contributed of rare excellence, but we had to depend too much on one or two kind friends, our busiest members, and hardest workers. I do hope we shall not have again to tax them so heavily, but that many others will get rid of that feeling of reluctance, that coyness of authorship, and contribute something from their observation and research to enrich the common stock of all.

Last year your respected President, my predecessor, stated that the banner of this Society bore two inscriptions, "Self-improvement" and "The Public Good." Be it so. For myself I heartily accept it. The two are indissolubly united. The very framework of our social system is so ordered by Providence that each one, strenuously endeavouring to develope, train, and use all his powers healthily and manfully, is a public benefactor. Ay! however humble his position may be, all around are benefited by his work and stimulated by his example; and it is an ambition worthy of the greatest soul that ever lived on earth, and fitted to warm the heart and nerve the will of the youngest associate of the Society,—the ambition to leave the world a little better for having lived in it.

Mr. ABRAHAM proposed a vote of thanks to the President for his address, praising it for its practical character.

Mr. SHARP seconded the motion, and said that the address was lucid, sympathizing, and peculiarly applicable to the present state of things. He urged the associates to join the classes in the School of Pharmacy.

Mr. SHAW supported the vote of thanks, which was heartily passed by acclamation.

The PRESIDENT responded, thanking the meeting for the kind reception which it had given to him, and advising an aggressive action of the Association against the apathy so prevalent in pharmaceutical and other matters.

Second General Meeting, held October 29th, 1868; the Vice-President, Mr. CHARLES SHARP, in the chair.

Donations to the Library of 'Liverpool Medical and Surgical Report,' No. 2; the 'Chemist and Druggist;' 'Proceedings of the Liverpool Polytechnic Society,' were announced, and thanks voted to the donors.

The following gentlemen were elected members:—Messrs. J. H. Pollard, J. Pidgeon, and E. Brown.

The SECRETARY exhibited some of the specimens of chemicals recently presented to the Association by the Council of the Royal Institution. The collection is one of rare beauty and excellence, especially in the department of vegetable alkaloids.

Mr. MURPHY proposed a special vote of thanks for this valuable present.

Mr. REDFORD seconded the motion, which was carried unanimously.

Mr. MURPHY then stated that the water supply of Birmingham had been recently under discussion, and that it had been stated to contain a very large quantity of organic matter. In the hot weather one half of the deaths in Birmingham had been due to diarrhœa. He had recently analysed a sample of the water, and found only about four grains of organic matter per gallon. There was a considerable quantity of alkaline carbonate, and he was inclined to attribute the injurious action to this cause.

Mr. TATE mentioned a case where water from wells near Oxford, which contained alkaline carbonates, had caused diarrhœa.

Mr. MURPHY then said that it was stated in all the books on the subject that, in making glass from salt, lime, and sand, hydrochloric acid was evolved. He had been making experiments, which showed that this view was entirely incorrect. The reaction which takes place is that chloride of calcium and soda are formed, and that it is chloride of calcium which volatilizes and not hydrochloric acid.

The PRESIDENT then called upon Mr. Murphy to read the paper for the evening, on "Zinc and its Combinations."

The author gave a review of the history of the metal, first as combined with copper to form brass and afterwards in the free state, together with the opinions of the old chemists as to its nature. A description of the English, Belgian, Silesian, and other methods of extracting the metal was given, and he expressed an opinion that the low position held by England in the zinc manufacture was not due to the want of ore of good quality, of which we have plenty, but to the apathy of manufacturers, who do not avail themselves of improved methods and modern science. The salts of zinc and their medicinal use were spoken of, and the paper terminated with an account of the part which zinc had played in organic chemistry in zinc ethyl, etc.

A vote of thanks was unanimously passed to Mr. Murphy for his interesting paper.

LEEDS CHEMISTS' ASSOCIATION.

The Sixth Annual Meeting of the Association was held in the Library of the Philosophical and Literary Society, on the evening of October 23, 1868; the President, Mr. REYNOLDS, in the chair. An amount of interest, never previously shown, was evinced, and from seventy to eighty persons were present.

The Honorary Secretary, Mr. YEWDALL, read the Annual Report, which commenced by recapitulating the subjects introduced at the monthly meetings, during the past session, viz. the President's Address; "Rational Therapeutics," by Dr. James Braithwaite; "Chemical Nomenclature and Notation," by J. Chapman Wilson, F.C.S.; "Carbolic Acid," by G. Ward, F.C.S.; "The Secretions of the Alimentary Canal," by T. Scatter-

good, M.R.C.S.; "Microscopic Crystallography," with illustrations by Mr. Waddington, Mr. Abbott, the Secretary, etc.

An obnoxious clause in the Railways Regulation Bill had received attention from the Association, which conveyed the views of its members to the parliamentary representatives of the borough, and it was satisfactory to state that the clause was amended. The caution to dispensers issued by the Executive Committee of the General Medical Council was carefully considered by the Association, which issued a circular to the prescribing practitioners of the town, requesting them to state their intentions as to the adoption of the formulæ of the British Pharmacopœia.

The Library has received some additions in the course of the year, and through the zeal and perseverance of a few Associates, a cabinet of Materia Medica specimens has been obtained.

The Report concluded by an earnest appeal to all chemists in the town to join the Association, and thus assist in carrying out its programme of useful operations, now rendered doubly important by the passing of the Pharmacy Act of 1868.

The Treasurer's accounts showed that the income for the year had been £20. 5*s*. 0*d*., a balance being left in hand of 15*s*. 1*d*.

Mr. HORSFIELD moved, and Mr. JEFFERSON seconded the adoption of the Report and financial statement, which was unanimously agreed to.

The election of a Committee for the current year was then conducted by ballot, the scrutineers giving the following as the result:—*President*, Mr. Reynolds; *Treasurer*, Mr. J. Land; *Librarian*, Mr. M. Wordsworth; *Secretary*, Mr. E. Yewdall; *Committee*, Mr. J. N. Horsfield, Mr. R. M. Atkinson, Mr. P. Jefferson, Mr. George Ward, Mr. William Smeeton, Mr. E. Thompson.

The prizes offered to the students in Mr. Ward's Chemistry Class were awarded as follows:—First prize, a book of the value of a guinea, given by Mr. Horsfield, awarded to Mr. J. P. Jackson; second prize, by Mr. Reynolds, awarded to Mr. T. Wilson.

The thanks of the Society were voted to the Council of the Pharmaceutical Society for its donation of the Pharmaceutical Journal during the year.

It had been announced by circular, that at the conclusion of the ordinary business of the meeting Mr. Edward Thompson would introduce the subject of the Pharmacy Act, for the purpose of offering any explanations that seemed desirable, and also to elicit inquiry. An animated discussion took place, the following being some of the points discussed, viz. the provisions of the Act as to labelling such compounds as Dover's Powder, Chlorodyne, etc.; also the position of such compounds as cough mixtures prescribed by the chemist; the registration of sales of proprietary vermin poisons; the case of "patent medicines;" the retailing of drugs differing in strength from those of the B. P.; the sale of medicines to surgeons; the position of widows, etc. etc.

The President, the Hon. Secretary, Messrs. Abbott, Beedle, Brown, Handcock, Horsfield, Roberts, Smeeton, Stead, and others, took part in the discussion, which was adjourned to the next meeting.

The second meeting of the session was held November 11; the President in the chair.

The following new members were elected:—Messrs. Bambridge, Duckenfield, Fell, Mitchell, Rhodes, Roberts, Robinson, Slater, Sleight, and Wheater; and associates as follows:—Messrs. Benson, Casson, Child, Green, Howorth, Mountain, J. C. Reinhardt jun., J. T. Reinhardt, and Wilks.

The PRESIDENT presented from Mr. Harvey eight volumes of the works of the Cavendish Society, and took the opportunity of urging a special subscription for the increase of the Library, on the ground that an organization amongst chemists must permanently exist in large towns such as Leeds, where a number of young men would now always be preparing themselves for the examinations rendered compulsory by the Pharmacy Act. Several members at once placed their names upon a subscription list for this purpose.

The Hon. Secretary, Mr. YEWDALL, brought forward a suggestion which originated with Mr. Abbott. It was to have a "Question Box" into which any member or associate could drop queries or suggestions referring to practical pharmacy,—the author of the idea having specially in view the numerous cases of doubt or interest which occur in dispensing. The discussion of these questions at the meetings of the association was

anticipated to prove valuable. The meeting approved the suggestion, and referred it to the Committee.

The discussion upon the Pharmacy Act, as adjourned from the last meeting, was continued, and many members took part in it.

Before the meeting separated, Mr. ABBOTT exhibited a very large and interesting collection of specimens representing microscopic crystallography, including sublimates, etc., and prepared by himself.

MANCHESTER CHEMISTS AND DRUGGISTS' ASSOCIATION.

A public meeting of chemists, druggists, and their assistants, in the Manchester district, was held, on Friday, November 6th, in the Memorial Hall, Albert Square, to take into consideration the provisions of the new Pharmacy Act, and to form an association having for its objects educational facilities for assistants and apprentices, the mutual improvement of its members by the formation of a library, museum, and school of pharmacy. The meeting was numerously and influentially attended, and Mr. Councillor Brown (Jewsbury and Brown) was called to the chair. The chairman, in his preliminary observations, explained that a few members of the trade, impressed with the importance of the provisions of the recently adopted Act, and considering the difficulties of procuring the necessary education for qualifying assistants so as to enable them to comply with the requirements of the law, had met together and arranged the present meeting. They desired that the projected association should include, as far as possible, all, whether in or out of the district, who were affected by the Act. After explaining that by law no one could, after December, sell any poison or dispense any medicine containing poison unless registered under the new law, and that the privilege of registration was accorded to all who were in business on their own account at the time of the passing of the Act, but not to assistants and apprentices, who were now required to educate themselves and pass an examination previous to commencing business, he proceeded to urge the necessity for providing the groundwork on which could be raised the contemplated higher educational qualifications required from future chemists and dispensers of medicine. He also dwelt on the importance of the whole trade forming themselves into a society, which by means of classes, lectures, meetings, and mutual association, would facilitate the carrying out of the new Act, which, while protecting the public, would raise the status of the members.—Mr. J. T. Slugg, F.R.A.S., moved, "That it is desirable that an association of pharmaceutical chemists and chemists and druggists in Manchester and the neighbourhood be formed, having for its objects, provision for the better education of assistants and apprentices, the mutual improvement of members, the general advancement of the interests of the trade, and the formation of a library, a museum, and a school of pharmacy; and that the title of the proposed association be 'The Manchester Chemists and Druggists' Association.'" Mr. Slugg contrasted the fortunate position of young men now entering the trade with that of young men who entered it when he did forty years ago, and said that "at last that happy day had arrived to which so many good and earnest men had looked forward for years. There could be but one opinion as to the importance and beneficial character of the Amended Pharmacy Act. It was no longer possible for ignorant and incompetent men to slip into the business, as some had done, and become competitors of the properly educated druggist." Mr. Slugg paid a just tribute of praise to the founders of the Pharmaceutical Society, with whose object he had always agreed, though he had not joined the Society, because he had always advocated compulsory examination. The passing of this Act had removed all cause for jealousy, and he trusted that all ill-feeling would be laid aside, and that every member of this now honourable calling would heartily unite in carrying out the objects of the Act. Those who were now in business, by means of the Act, had suddenly become possessed of great privileges; but the possession of privilege always entailed on its possessor some corresponding duty. Their duty in the present instance was undoubtedly to look to their assistants and apprentices, to do what they could towards furnishing them with suitable helps in the way of education. He concluded by urgently appealing to employers to join the Association at once,—help at the beginning being of more value than after it had become a prosperous institution, and hoped also that the young men, assistants and apprentices, would become members. The resolution was

seconded by Mr. Wilkinson and unanimously adopted.—The rules, as framed at a preliminary meeting, were also unanimously approved, and the following gentlemen were elected Officers and Council for the ensuing year:—*President*, Mr. Thomas Standring; *Vice-President*, Mr. W. S. Brown; *Treasurer*, Mr. G. S. Woolley; *Secretary*, Mr. F. B. Benger. Messrs. Bateman, Halliday, Hampson, Robinson, Slugg, F.R.A.S., Jas. Standring, Wheeldon, Wilkinson, Bagshaw (Oldham), Blain (Bolton), Bostock (Ashton), and S. Kay (Stockport). Its meetings are to be held monthly, and an adjourned meeting, to give effect to the above resolution, was agreed upon. After the usual vote of thanks to the chairman, the names of nearly one hundred members were enrolled, and it was intimated that others could be sent in to the secretary, treasurer, or any member of the committee.

Subscriptions—10*s*. Members, and 5*s*. Associates, the latter being Assistants and Apprentices only—may be paid to the Secretary, F. B. Benger, 1, Market Place, Manchester, or to the Treasurer, George S. Woolley, 69, Market Street, Manchester.

MEETING OF CHEMISTS AND DRUGGISTS, DUDLEY.

A meeting of Chemists and Druggists was held at the Bush Hotel, on Friday, the 20th of November, to consider the desirability of the earlier closing of their shops, in order to afford to the young men in their employ greater facilities for reading and study, so that they might, as far as possible, prepare themselves for passing the examinations required by the Act of Parliament recently passed, before they would be able to commence business. There were present Messrs. Clark, Denison, White, Dawson, Clark, jun., and Hollier; and communications were received from others who were unable to attend, expressing their willingness to abide by any resolutions which might be come to by the meeting. Mr. Hollier occupied the chair, and briefly alluded to some of the provisions of the recent Pharmacy Act, remarking that the passing of such an Act, requiring a higher educational and scientific standard from the Chemist and Druggist for the time to come, must and would greatly elevate and advance their trade. Its effect might not be apparent during the lifetime of himself and others then present, but the chemist of a few years hence would, in regard to the past, bear the same comparison as did the medical profession now to the barber-surgeons of 1815. *Then* the intelligent and scientific chemist would be the rule, and not, as *now*, so frequently the exception. Mr. Hollier hoped that the earlier closing of their establishments would not only that evening be decided upon, but unanimously abided by, and that it would not end, like previous attempts, in one keeping open his shop half an hour longer than the specified time, and thus produce a spirit of rivalry which resulted in the irregular system prevailing at the present time. The extra hour, too, would have as good an effect with the master as with the young man, and be as great a boon to the employer as the employed; and, if agreed to by all, he felt convinced and was sure would not injure one.

The following resolution, proposed by Mr. Clark and seconded by Mr. Dennison, was unanimously passed:—"That, in order to afford needful time for reading and the study which will be required to enable the assistants and apprentices in their employ to pass the examinations required by the provisions of the recent Pharmacy Act previous to any one being able to commence business as a chemist and druggist, we, the undersigned, hereby agree to close our respective establishments at eight o'clock each evening of the week with the exception of Monday at nine o'clock, and Saturday (market day) as usual." Some other resolutions tending to give effect to the foregoing were passed, together with a vote of thanks to Mr. Hollier, the chairman. It was also determined that it should be duly announced throughout the borough by handbills and advertisements.

PLYMOUTH ASSOCIATION OF CHEMISTS AND DRUGGISTS.

The Second Meeting of this Association was held on Wednesday, November 11th, at the Athenæum, Plymouth, when papers were read by Mr. S. Hill, of Plymouth, on "The Pharmacy Act and Dispensing," and by Mr. Frank Codd, of Devonport, on "Spectral Analysis, illustrated by the Spectroscope proper and the Microspectroscope."

Mr. J. C. Radford, the President of the Association, occupied the chair. There was a large attendance, the audience not being confined to the trade. Among those present were Mr. H. S. Evans, Vice-President, and one of the Examiners of the Pharmaceutical Society, who had kindly consented to come from London to support the Association, Dr. Prance, Messrs. J. Bourne, C. Croydon, R. S. Down, Shapton, Herron, J. H. Filmer, and Dr. Woolcombe. In opening the meeting, the President observed that the last time they met there the room was crowded with things which were rare and beautiful, and it was filled with a brilliant assemblage of persons of rank, talent, and learning. That might probably be regarded as their holiday; now they began their work, and he hoped that as they were successful in keeping a good holiday they would not be found wanting when they came to their work. He desired to call attention for a moment to a section of a tree which was lying upon the table. At one of the learned societies of Liverpool a question arose as to the salubrity of the climate of Liverpool, and it was stated that a magnolia-tree had lived in the winter in the neighbourhood in the open air, one individual stating that the tree was six inches in diameter. The section of a tree he alluded to was part of a magnolia-tree which grew and died in that neighbourhood, and in its broadest point the diameter of the section was just eighteen inches. Now, it would be a curious thing to know whether the other trees of the same nature in this and the adjoining country died at the same time, or were still living,—whether that which caused the death of the whole of those trees in the neighbourhood was local, or whether it extended to any considerable distance. He mentioned those facts because, seeing a reporter present, they might be able to get information from different parts of the country; and he would suggest to the members of the Association that it would be desirable for them to endeavour to ascertain the fact. He desired also to draw attention to a very interesting and a very valuable case which stood upon the table, containing specimens of various articles in the materia medica, and which had been presented to the Association by Mr. Evans.

Mr. Hill then read his paper on "The Pharmacy Act and Dispensing," pointing out the importance to Pharmaceutical Chemists of its provisions, and the responsibility attaching thereto.

In consequence of the indisposition of Mr. Codd, Mr. F. Balkwill kindly consented to read the paper on "Spectral Analysis." The subject, although it was generally supposed to be a new one, really it was not the case, as it was recorded that Sir John Herschel used the method, in a crude form, so early as the year 1822. Yet it was only within the past ten years that spectrum analysis had reached its present important position in the scientific world, having been first applied in its present form by Kirchhoff and Bunsen. Spectrum, or by some called "spectral," analysis was the art of analysing coloured flames, bodies, etc., by means of a prism, and the principal branches of science to which it was now applied were, first, "solar and stellar chemistry;" secondly, "as a most important assistant to the analytical chemist;" and thirdly, "in a modified form, in conjunction with the microscope, it was used in order to detect the presence of, and difference between, certain coloured liquids, solids, etc., otherwise undeterminable." It was to the latter two divisions of the subject that the lecturer drew the attention of his hearers, being the more interesting to them because the more intimately allied with their professions; and, after having explained the foundational principle of the method, together with the mode of applying that principle to the building of the spectroscopes, he proceeded to examine the subject "as applied to qualitative analysis," observing that it had long been known that many substances were readily recognized by their property of colouring a colourless flame, but this method was available only when those substances were in an unmixed state. Now that defect was remedied to a surprising extent by using the spectroscope; for, from the fact of each base possessing its own peculiar position and appearance, however numerous the salts might be in a compound, all their bases were readily recognized by the practised eye, and with a certainty beyond doubt, thus giving results in a *few seconds* which could formerly be obtained only, if at all, in *hours* or *days*. As instances of the extreme delicacy of the test, he stated that the 250,000th part of a grain (a scarcely estimable quantity) of sodium was easily detected; also that this metal existed in the atmosphere in sufficient quantity to give an almost constant spectrum. Other examples were cited, but, as a proof of the great value of the method, it was mentioned that, in addition to having determined the widely-spread presence of metals, etc., formerly considered very rare, four new metals, viz. cæsium, rubi-

dium, thallium, and indium, had been discovered by its means since the year 1860; and surely, said the lecturer, "judging from what has been already accomplished in such a short period, are we not justified in the idea that many of the old-established so-called chemical facts will be revolutionized by the new method?" In vindication of that idea he traced the history of the discovery of the above-named new metals. The various processes necessary in order to obtain the different spectra were mentioned; so also were described the modes of examining any particular spectrum more minutely, as well as the means of registering the positions of the different spectral lines or bands. Having described the difference between the foregoing method and that branch of the subject denominated "micro-spectroscopy," the lecturer also adduced several interesting facts in proof of the great practical value of the latter mode, one especially in a medico-legal inquiry.

At the close of the reading of the papers, the President invited discussion. Mr. Evans observed that he had listened with great pleasure to the papers which had been read. Mr. Hill's paper had gone through a very difficult subject in a very concise way; and he had shown clearly the weak as well as the strong points of the Pharmacy Act.

A discussion then ensued, in which Mr. A. Balkwill, Mr. Herron, Dr. Prance, and others took part. In answer to questions, Mr. Evans said that in the next session of Parliament something would probably be done with regard to dispensers in hospitals and persons of that class. Mr. Herron suggested that it would be well if the law were altered in such a way that a medical man should be obliged to put "B. P." on his prescriptions. Mr. Evans said the law was perfectly clear that the dispensing chemist was bound by the law to observe the British Pharmacopœia, but there were cases in which he would have to use his own discretion. If he got a prescription dated 1864 he must not make it up according to the Pharmacopœia of 1867. The responsibility then rested with the medical man and not with the druggist.

During the discussion, Dr. Prance said there could be no doubt that the Society was of great use to the medical men, for he had often said that whatever skill a professional man might use in a case, it was unavailing if he could not get his prescriptions properly prepared with the best drugs.

Votes of thanks were passed to Mr. Hill and Mr. Codd for their papers, and to Mr. Evans for his presence and the presents he had made to the Institution.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

A meeting of this Association, to which all having an interest in pharmacy were invited, was held in the Mechanics' Institution, on Thursday, 9th November, for the purpose of hearing Mr. JOHN MACKAY, of Edinburgh, deliver a lecture in explanation of the Pharmacy Act, 1868. About four hundred gentlemen were present, many of whom were surgeon-druggists.

Mr. KINNINMONT, President, occupied the chair, and briefly introduced Mr. Mackay, who delivered the lecture, which is given at length in our report of the meeting at Edinburgh. At the conclusion, the President intimated that the lecturer would be glad to answer any questions, when Mr. Mackay underwent what is known in Scotland, during election times, as a "heckling." Many of the questions were of a sensible nature, and put to gain useful information, others were evidently intended as puzzlers, such as give a correct definition of the word 'persons,' etc., the asking and answering of which were received with loud laughter.

One medical gentleman, keeping open shop, cross-questioned Mr. Mackay at great length, particularly on the 16th clause, amidst considerable manifestation of feeling among the audience, which appeared for a time to have almost divided itself into two parties, surgeon-druggists and druggists proper. He replied with great tact and good humour to his questioner, and had much the best of it. He stated, as his belief, that Clause 16 would be repealed, or modified by a short Act to be brought in for that purpose.

Mr. KINNINMONT, in moving a vote of thanks, thought that surgeons having shops in Scotland were needlessly afraid of the working of Clause 16, as he believed that any judge would decide that a surgeon holding licence from his college to practise pharmacy was a legally qualified apothecary in Scotland.

A vote of thanks to the President, moved by Dr. HISLOP, closed the proceedings, and the meeting separated at a late hour, having continued till past midnight.

ABERDEEN ASSOCIATION OF ASSISTANT CHEMISTS AND DRUGGISTS.

The first annual meeting of the above Association was held on Monday evening, 9th November, when about forty members were present.

The Secretary's half-yearly Report was read over, and highly approved of, showing that several able and instructive papers had been contributed on subjects relating to the business, and the attendance since the formation of the Society in March last has been such as to augur well for the future success of the Association. A cordial vote of thanks was then passed to the retiring office-bearers, and the following were elected for the ensuing year,—Mr. J. Thom, President; Mr. R. Hall, Vice-President; and Mr. J. Strachan, Treasurer and Secretary.

DUNDEE CHEMISTS AND DRUGGISTS' ASSOCIATION.

This Association, which was founded immediately after the meeting of the British Pharmaceutical Conference at Dundee in 1867, held its first annual supper at Lamb's Hotel, Dundee, on Wednesday, November 4th. Mr. David Russell, President of the Association, occupied the chair, Mr. William Park, Broughty Ferry, and Mr. D. H. Ferrier acting as croupiers. After an excellent supper the Report was read by Mr. James Hodge, the Secretary. It went very fully into the business of the year, showing it to have been important and varied. Nine monthly meetings had been held, at which papers of a scientific and practical character were read. The attendance had been very fair. Several very important suggestions were thrown out as to the future of the Society, which, if acted on, would tend to increased prosperity, and be of mutual benefit to the members. The chairman had the greatest pleasure in congratulating the members on the occasion of this their first annual supper. It had met with a greater amount of success than he anticipated, and certainly gave good encouragement for the future. He had also great pleasure in noticing the Report which had been read, and trusted that the several hints as to personal interest and increased attendance would meet with the attention they deserved. He embraced the opportunity of strongly urging all present, and especially the younger portion, to give increased attention to their daily duties behind the counter. Their profession, besides being a most honourable, was also a most arduous one, requiring scrupulous care in manipulation, and trenching more and more on their head knowledge.

Mr. William Doig next addressed the meeting on the importance of the study of chemistry and botany, in order to gain a true and thorough knowledge of pharmacy. He gave instances of the successful prosecution of these sciences under great difficulties.

The Chairman then said he had a very pleasing duty to perform, viz. to propose that Mr. James Scrymgeour should be elected an honorary member of the Society. That gentleman had taken a great interest in several matters in which the Society was concerned, and he was sure, from the manner in which his assistance was given, that he would be glad to do everything in his power for the furtherance of the botanical studies of the young members. The motion was carried by acclamation, and Mr. Scrymgeour briefly replied, thanking the Society for the honour done him.

Votes of thanks to the chairman and croupiers were heartily carried. The meeting, which throughout was very enjoyable, was concluded by the whole joining in singing "Auld Lang Syne."

ORIGINAL AND EXTRACTED ARTICLES.

"PHARMACIST."

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Dear Sir,—*Pharmacist* has been used to describe one pursuing the avocation of Pharmacy not connected with the Pharmaceutical Society. Now that such

distinctions are happily swept away, may I venture to suggest the general adoption of a word which is entirely in accordance with the genius of the English language?

The root is PHARMACY; the man who practises it is a *Pharmacist;* the descriptive adjective is *Pharmaceutical.*

So also in French. The root is PHARMACIE; the man who practises it is *un Pharmacien;* the descriptive adjective is *Pharmaceutique.*

On strictly philological grounds, some have already considered that the Pharmacist has more claim on national sympathy than the Pharmaceutist.

Ever yours,

26, *St. George's Place, Hyde Park Corner.* JOSEPH INCE.

REMARKS ON SENNA.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

The remarks on senna by Messrs. T. and H. Smith afford me a legitimate excuse for sending you a few additional notes on the subject.

I would first take the opportunity of confirming Messrs. Smiths' experience of the disagreeable effects on the mucous membrane of repeated doses of the active principle of senna. Last year, not often being able to find a "corpus vile," I was frequently dosing myself with it, but at last I found I was doing myself an injury. The irritation was in my case confined to the bowels, but there it was unfortunately persistent. I believe I still am suffering somewhat from the effects of it, indicated by an inability to tolerate the action of drastic cathartics I once used to be able to take with impunity. I believe also that a rather serious attack of dysentery was due to the same cause.

It would be only fair, I think, to explain that these troubles were occasioned by an improper use of the drug, and that its exhibition, when controlled by an ordinary amount of judgment, need entail no unpleasant consequences.

I have tried, I should think, a score of different methods for preparing the cathartic acid, but none of them have completely satisfied me. The precipitation process of Messrs. Smith, varied in several ways, I tried last year, but gave it up as wasteful and troublesome.

I found, too, that methylated spirit could not be used, in consequence of its naphtha flavour adhering pertinaciously to the cathartate; and, on the other hand, that if pure spirit were used, and recovered in the usual manner by distillation, it became so contaminated with the essential oil of senna that it could not be made use of except for preparations themselves containing senna as an ingredient. I have now by me several gallons of spirit in that condition, waiting their turn for Daffy's Elixir, etc. Where this objection would not apply, the plan I think best is the following:—

Add to 2 parts of small Alexandrian senna 3 parts of proof spirit, taking care that the senna is thoroughly and uniformly damped; let them rest together for a day, then again mix them well, and cram them into a covered earthenware pan; macerate for a week, then express as strongly as possible. To the liquid obtained add twice its volume of rectified spirit, and set aside for a day. The resulting precipitate is cathartic acid combined with several bases, and is effectual as a purgative in doses of 4 or 5 grains. It should be made into syrup or liquor at once without previous drying, during which it would be liable to suffer alteration. A small preliminary experiment will indicate the right proportion to use.

Using a screw-press only, I have in this manner obtained $2\frac{1}{2}$ drachms of dry cathartate per pound of senna employed. The spirit used is recovered, as I have before observed, by distillation in the ordinary way.

A cheaper, but far more troublesome plan is to infuse for two or three hours, in 2 gallons of boiling water, 1 lb. of senna, and to the filtrate add 1 oz. of acetate of lead; to the liquor freed by filtration from the lead-precipitate add 8 oz. of liq. pl. diacet. Wash the yellow precipitate thus occasioned by decantation, and finally in a cloth, and then dry and powder it. It will weigh about $2\frac{1}{2}$ oz. Digest this powder with excess of recently-prepared sulphide of ammonium (NH_4S), filter, and wash s. a. Evaporate the filtrate cautiously to a thin syrup, and add to it when cold four or five volumes of rectified spirit. The dried precipitate will be cathartate of ammonia tolerably pure, and will weigh about $3\frac{1}{2}$ drachms. The recovered spirit will be pure enough for general use, but comparatively little is required.

Messrs. Smith will perceive that when using the term "strong alcohol," I did not refer to proof spirit. The first precipitate obtained by adding alcohol to a strong fluid extract of senna is mainly composed of malate or some other salt of lime.

I should be very pleased if some one more fortunately placed than myself could be induced to test fairly the therapeutical properties of the active principle of senna.

I am yours, etc.,

Weymouth, November 20, 1868. THOS. B. GROVES.

THE PRESERVATION OF SYRUPUS FERRI IODIDI.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—In the current number of the Pharmaceutical Journal I observed a letter "On the true method of keeping the Syrupus Ferri Iodidi free from changes," in which your correspondent recommends the use of vegetable parchment as a covering to the bottles containing this syrup, instead of corks. In summing up the results of his experience he states that it would prove an additional advantage if the syrup were made thicker than usual. I think the propriety of adopting this last recommendation is more than doubtful, for I have found that this syrup deposits crystals of sugar if made of greater density than the Pharmacopœia directs; that it is unnecessary, and that the trouble involved in capping with the vegetable parchment (a process which, I presume, would have to be repeated each time that a few drachms were removed) is unnecessary also, I proceed to show.

I have in my possession a bottle of syrupus ferri iodidi which has now been made more than twelve months; it is simply corked, and has been frequently exposed to the air. During the last six months the bottle has been kept only half full, and the syrup is still in perfect preservation. The method adopted to ensure this result is the simplest conceivable; it consists (as recommended in a previous letter, see April Journal this year) in exposing the syrup to sunlight for a short time daily. The bottle I have alluded to has been kept in a corner of the window of our shop, and has there been exposed to many changes of temperature.

I believe I am indebted to a writer in the Pharmaceutical Journal for the method of preserving syrupus ferri iodidi by exposure to sunlight; possibly to the Messieurs T. and H. Smith, of Edinburgh, to whom pharmaceutists are under many obligations; for I find on page 353, Vol. VII. second series, the following:—"A few remarkable facts, in opposition to the general opinion that exposure to sunlight is conducive to generation of colour in such preparations, are, we think, worth relating. We have frequently observed that, under certain circumstances, coloured syrupus ferri iodidi is *bleached by exposure* to sunlight."

I can only say that for some years all the syrup of iodide of iron prepared by me has been placed in a window as soon as made, and used from the window without any precaution as to keeping the bottle full, or at any particular temperature, which things are more or less impracticable, and, happily, unnecessary.

I am, Sir, your obedient servant,

THOMAS HENRY HOLLOWAY.

Upper Sydenham, November 14th, 1868.

ON THE ALLEGED POISONOUS QUALITY OF BEEF-TEA AND EXTRACT OF MEAT.

BY BARON LIEBIG.

Although it is contrary to common sense to believe that the daily food of men and animals could possibly contain a substance injurious to health, it was nevertheless to be expected that the experiments made by Dr. Kemmerich on the effect of beef-tea and its salts on animals would produce anxiety and fear in some weak minds; and, indeed, the article which appeared in 'Once a Week,' entitled, "A Word of Warning to Cooks," is a proof that such fears really existed. I believe, however, that a simple acquaintance with the experiments of Dr. Kemmerich will be sufficient to dispel them completely. The results of these experiments are of a very harmless character. Dr. Kemmerich made most of his experiments, not upon men, but upon graminivorous animals, viz. upon rabbits, and only one experiment was made by him upon a dog. The broth was made from horseflesh, and injected into the stomach of the animals in progressively augmented quantities, the chief results of which are as follows:—

A rabbit weighing not quite two pounds, which had received the broth from one pound of horseflesh (equivalent to half an ounce of extract), remained perfectly well. It polished itself with its paws, was very lively, and no disturbance in the state of its health was afterwards perceptible.

A second rabbit of two pounds weight, into the stomach of which the extract of one pound and a quarter of horseflesh had been introduced, deported itself in just the same manner; its pulse became more vigorous, its breathing slower, and it remained lively and healthy.

When, however, the doses were increased, and the extract of two pounds and of two pounds and a quarter of flesh were injected into the stomach of the rabbit, such quantities of concentrated animal food were evidently too much for the little graminivorous creature, which by such doses Dr. Kemmerich succeeded in killing, a result at which nobody will be surprised. It follows that Dr. Kemmerich could likewise have killed stronger animals with beef-tea; and it may be assumed that he would have killed even a man of 140 lb. weight (seventy times heavier than the rabbit) by a dose of beef-tea seventy times as large,—namely, by the broth of 140 lb. of flesh, equivalent to about 4 lb. of extract of meat. Less than a couple of pounds of extract would, however, scarcely have been sufficient, for one of the experiments of Dr. Kemmerich on a carnivorous animal contrasted with the experiments on the rabbits; he did not succeed in poisoning that animal with beef-tea.

It was a small but very strong terrier, which had taken the broth of four pounds of flesh (equivalent to two ounces of extract), which the animal seemed to enjoy considerably. As however the whole quantity was too much for it, it became necessary to inject the remainder into its stomach. Notwithstanding the enormous quantity of extract of meat which had been introduced by force, the terrier remained very comfortable and lively, and no symptom of any disturbance of its health became manifest. Double the quantity of meat-broth which killed the rabbit had not the least injurious effect on the little dog.

These experiments and the above calculations show sufficiently what is to be thought of the poisonous effect of beef-tea; it belongs to the category of cases where people have eaten *pâté de foie gras*, turtle soup, or oysters to such excess as to cause death; but no sensible person will ever dream of ascribing, on that ground, poisonous qualities to *pâté de foie gras*, turtle soup, or oysters.

The experiments of Dr. Kemmerich are described in his 'Dissertatio Inauguralis,' for obtaining the degree of Doctor from the medical faculty at Bonn; and in his connecting with his conclusions the meaning of the word "poison," he in fact succeeded in drawing to his work the attention of the public, which otherwise would probably have taken little notice of it.

Dr. Kemmerich ascribes the effect of beef-tea not to its aromatic and combustible ingredients, but to the potash salts which it contains, and of which it is well known that in larger doses they exercise an injurious effect on the organism; nevertheless, and this is a matter of great importance, potash salts are an element of all articles of food; they not only form the chief ingredients of the salts of all sorts of flesh, including the flesh of fish, but likewise of all other food, and of all the food of animals. The alkaline salts of bread, vegetables, and hay consist of potash salts, and, with the exception of chloride of sodium (kitchen salt), soda salts are but rarely contained therein; in fact, it may safely be asserted that without the potash salts our food would be quite unfit for nourishment.

It does not follow, therefore, that these salts, when taken in excess, like any other—even the most harmless substance—might not eventually exercise an injurious effect. It is, however, preposterous to apply the meaning which we are accustomed to attach to the word "poison" to the effects of such an excess. It is surely quite absurd to connect this meaning with substances which we daily take in our food, and which are quite indispensable to our existence.

Dr. Kemmerich himself says (p. 31), "I do not think of the possibility that beef-tea, in the form in which it is used for household purposes, could be the cause of poisoning; it therefore does not require a medical warning to protect from poisoning with Liebig's extract of meat." He further says, "In medical practice, wine, ether, camphor and musk are eminent analeptica (invigorating and refreshing remedies). Compared to these giants of medicine, beef-tea modestly occupies a subordinate position. If, however, it be necessary to preserve the exhausted body from protracted illness, then there is no other remedy in the whole rich store of medicine which can afford such assistance for regenerating the diseased organism as repeated doses of beef-tea."

One of the three theses defended by Dr. Kemmerich, on his promotion before the medical faculty at Bonn, is worthy of observation by the British navy. It runs thus:—

Thesis 2. "The best remedy against scurvy is beef-tea, or Liebig's extract of meat."

Munich, November, 1868.

DYNAMITE.*

BY M. NOBEL.

Scientific and other papers have lately given much attention to a new blasting agent named "dynamite." It is nothing but nitro-glycerine absorbed in highly porous silica, and if I have given it a new name it is certainly not by way of disguise; but its explosive properties are so much altered as fully to warrant a new denomination.

Dynamite consists of 75 per cent. of nitro-glycerine and 25 per cent. of porous silica. Hence it appears to possess only $\frac{3}{4}$ of the power of nitro-glycerine, the specific gravity of both substances being very nearly the same. But, practically, there is no advantage in the greater concentration of power of nitro-glycerine. It cannot, or at least ought not, to be poured direct into the borehole, since it easily causes accidents by leaking into crevices, where it explodes under the miner's tools. It must, therefore, be used in cartridges, which leave considerable windage; whereas dynamite, being somewhat pasty, easily yields to the slightest pressure, so as completely to fill up the sides of the borehole, and leave no windage whatever. For this reason a given height of dynamite charge in a hole will contain quite as much nitro-glycerine as when the latter is used in its pure liquid state.

It is necessary, even at the risk of some lengthiness, to make this point clearly understood; for if the advantages otherwise derived from the transformation of nitro-glycerine into dynamite were obtained at the expense of a great depreciation of its power, the substitute might be a safe but not a useful one.

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* Paper read before the British Association at Norwich.

As it is, the block of wrought iron here deposited will bear testimony to its great power. It was originally a cylinder of 11 in. diameter and 12 in. height, of best scrap iron, and cut off from a shaft. The borehole through its centre was exactly 1 in., and the charge of 6 ounces was put in without securing either end by any sort of plug or tamping. The cylinder was blown at Merstham, on the 14th July, in the presence of a large audience. Allowing for the hole, and putting the tensile strength of the iron at 20 tons per square inch, the strain necessary to effect the rupture must have been equal to 2400 tons; and since there was no plug at either end of the hole, it is evident that the charge was too much for the work. Besides blasting the cylinder, it had hurled the one half here deposited with such violence against a $\frac{3}{4}$ in. boiler plate at some distance as to break it.

No wonder that a substance which tells so well on iron should be effective against rock.

Coupled with this great power is a safety, for proofs of which I will simply refer to the tests publicly made both at Glasgow and Merstham. A box, containing about 8 lb. of ynamite (equal in power to 80 lb. of gunpowder), was placed over a fire, where it slowly burned away; and another box, with the same quantity, was hurled from a height of more than 60 ft. on the rock below, no explosion ensuing from the concussion sustained.

It is difficult to see what more can be required from a blasting material in order to be called safe; but some experiments made lately at Stockholm have put it to a still more severe test. A weight of 200 lb. was dropped from a height of 20 ft. on a box containing dynamite, which it smashed, of course, yet no explosion took place. An account of this experiment is to be found in the Stockholm paper 'Aftonbladet,' of the 7th of this month.

Such a test can leave no doubt that dynamite offers sufficient safety against concussion for all practical purposes; and we may say, as a Prussian military commission recently reported, that it appears to be the safest of all known explosives.

To those not fully acquainted with the nature of nitro-glycerine, it seems puzzling that a mere absorption should be sufficient to produce such a radical change in its essential properties; but when we come to examine the matter closely it is easily accounted for.

The greatest, and almost the only drawback on nitro-glycerine is its liquid form. Much as has been written on the danger of congealed nitro-glycerine, I can confidently assert that if the solid form was its natural state at the ordinary temperature, we should hardly have had to deplore a single one of those fatal accidents which it has caused. Moreover, it is a very erroneous notion that crystallized nitro-glycerine is more sensitive to concussion than the liquid one. The reverse is the case, and in a very remarkable degree; but that is immaterial to the present question, and I only mention it to show how fancy notions take root, and defy even the plain truth of simple investigation.

Nearly all the calamities caused by nitro-glycerine have, in my opinion, been owing to leakage, which, for practical reasons, it is very difficult to prevent, and are, therefore, indirectly chargeable to its liquid state. A substance sensitive to concussion, unless it is quite unmanageable like chloride of nitrogen, can easily be protected against accidents by wrapping it in a soft material; but if that substance is a liquid and a leakage takes place, it becomes subject to the danger of direct percussion; and if nitro-glycerine in that condition becomes exposed to the sun's rays, the heat which it takes up renders it so sensitive as to become dangerous under the slightest blow.

From the very first beginning I have given special attention to the packing of nitro-glycerine; but, much to my regret, I must say that it is as yet far from satisfactory. Casks are not tight enough for oily liquids, and the property of nitro-glycerine to expand when it congeals has obliged me to resort to square tins. These are left unpacked in the factory for a month at least, to ascertain whether they are tight, yet I can scarcely remember a single instance of a cart or cargo of nitro-glycerine having reached its destination without a case or more of leakage. The reason is probably to be found in the pressure to which the tin becomes exposed when the air which is confined inside, as well as the nitro-glycerine, becomes expanded by an increase of the external temperature.

Whatever be the cause, it is certainly wrong to lay the blame on nitro-glycerine for what has been due only to a practical difficulty. Let us suppose, for instance, the case of gunpowder being transported in cases dropping out, continuously, part of the contents.

A mining accident would almost be a rarity, and it is really a proof of the safe properties of nitro-glycerine that accidents have occurred almost only on those occasions (as at Aspinwall and San Francisco) when it was forwarded under a wrong declaration, and consequently the necessity of cautious handling could not be known.

These hints will give sufficient insight into the importance of converting nitro-glycerine into a solid. It is not only a theory or some demonstrative experiments on which I base that assertion, but also on practical experience. Dynamite has only recently grown to be an article of commerce, yet the quantity sold hitherto exceeds fifty tons, and the most serious accident it has caused was the case of a man who, having lighted the fuse, kept the cartridge in his hand till it exploded and blew off his arm. No explosive can be safe against accidents of that kind.

Besides the security derived from its solid form, dynamite has over nitro-glycerine other special advantages. Its sensitiveness to concussion is, as I have already stated, reduced in a very high degree, and since fire does not cause it to explode, it offers great security for transportation and storage. Besides, it is quite natural that miners should prefer, as more practical, a solid to a liquid explosive. Dynamite is now generally sold in ready-made cartridges, and nearly all the workman has to do is to put them into his borehole and fire.

Having now compared the two explosives, nitro-glycerine and dynamite, and shown the reasons why the latter, with equal power, is far superior to the former in point of safety and facility for use, I will briefly point out the sterling properties which render nitro-glycerine such a highly valuable blasting agent. The merits of dynamite are essentially the same, so that what is said of one is in the same measure applicable to the other.

The miner's work is divided in two parts, viz. to make a chamber for the explosive, and to charge it. If that chamber was a matter of small expense, it might be very immaterial whether the amount of power required to do the work occupied a great or small bulk. But drilling holes in any rock, and especially in hard ones, is a slow and tedious labour, and there are mines where it takes a man three days of hard work to make a 1 in. hole of only 24 in. depth. Three days' labour, exclusive of tools, represents at least 9*s*., yet the charge of gunpowder which can be lodged in such a hole is at most six ounces, or a value of less than 2*d*. It is easy, from such an example, to see why the miners should be anxious for a more powerful explosive, and ready to pay a much higher price for it. The instance here given is almost an extreme one, yet even in rock of very little hardness the cost of labour always greatly exceeds the value of the explosive used. It needs no explanation why an explosive containing, within the same bulk, ten times more power than gunpowder, should greatly reduce the number of boreholes and warrant a common saying amongst the workmen in Sweden, that they would blast with nitro-glycerine even if they could get gunpowder for nothing.

I have been frequently asked for a positive statement as to the economy in labour which the use of dynamite effects. This, however, is a question which cannot be answered in a positive manner, for every kind of rock would require a special estimate based on its hardness, the nature of the strata, etc., and which greatly vary, not only in different localities, but within the limit of a single mine. Every one will therefore have to form his own estimate, but as far as I have been able to ascertain, the use of dynamite or nitro-glycerine generally causes a reduction of at least one-third on the general cost of blasting, which is a very great saving indeed, considering that the cost of the explosive rarely figures for more than ten per cent. of the expense.

I am, however, not in a position to give on this subject as full information as I might desire. The miners are generally extremely sparing in communications of that kind. Amongst my correspondents I can find only one who gives clear and positive statements in figures of the saving effected. It is Mr. Alexander, manager of the "Phœnix" mine, on the Lake Superior. His letter is dated February 2, 1868, and the mine had up to that time used 7000 lb. of nitro-glycerine (they have no dynamite yet), so that the result is certainly based on sufficient practical experience. The material had been purchased from New York at the price of 1 dol. 50 cents per lb., irrespective of the cost of transportation to the Lake Superior.

Another statement in figures is that of Mr. Nondenfelt, director of the Great Northern Railway, in Sweden, who, as far back as the 19th July, 1865, asserted that the use of nitro-glycerine had allowed his contracting for blastings with a reduction of 25 per cent.

Mr. Unge, who has blasted with nitro-glycerine an extensive tunnel through Stockholm, states the saving to have been 23 per cent. on the cost of blasting, and the progress of the tunnel 87 per cent. quicker than when gunpowder was used.

These results show that even in the present state of comparative inexperience in the use of the new explosive, a great economy is obtained.

The saving of labour which dynamite causes is its greatest feature. Next to that we must class the saving of time. Nearly every mine is dependent on the progress of its shafts and pits; and as for railway tunnels, the famous one through Mont Cenis is only a glaring example of the necessity of quickening the tedious work.

Next to the saving of time ranks its peculiar adaptability to wet ground, since water has no effect on the charge. Every miner has had more or less experience how difficult it is to blast with gunpowder wherever the rock is water-bleeding, which is only too common.

Another sterling advantage of dynamite is that it needs no tamping, and consequently does away with a great number of minor accidents, which are little thought of in general, being too common to be reported in the daily papers, but form nevertheless a very long and sad list of continued calamities. I was told in Cornwall that by far the greater number of accidents, occurring in the mines of that county, are due to the act of tamping. It is abuse, I admit, for a hole may be tamped without firing the charge; still, it is very desirable to provide against a source of accidents which, after centuries of experience, still continue to exact such numerous victims.

It would be a great drawback on the advantages here set forth if, as has been sometimes asserted, the fumes of nitro-glycerine or dynamite were of a noxious nature. The best answer, perhaps, to those who maintain that opinion, is that a great number of mines are daily using it for underground work, and that the miners do not at all complain. The truth is that when nitro-glycerine is allowed to leak into the crevices of a borehole, it does not all explode, and being dispersed in the atmosphere causes a severe headache. It is, however, easily remedied by using cartridges, which prevent leakage, and in the case of dynamite, which is a solid, that inconvenience falls away entirely. Since that explosive became introduced no complaints have been made, and the workmen in many mines assert that dynamite cannot be nitro-glycerine, because the fumes are so different.

So far its properties, and now we will examine the practical results.

The introduction of dynamite is so recent that its advantages over other blasting agents cannot be proved by statistics. But in all except danger it is so analogous to nitro-glycerine, that the results obtained with the latter will allow us to form a clear estimate of its commercial value. Sweden is the only country where nitro-glycerine has been in use ever since 1865; it is therefore the most conclusive example. The sales in that country, as estimated from the books of the Nitro-glycerine Company at Stockholm, were, in 1865, 32,258 lb.; in 1866, 48,785 lb.; in 1867, 76,575 lb.; and during the first six months of the present year reached 64,293 lb. These figures show a steady and rapid increase. The quantities are not enormous, but it should be borne in mind that Sweden, although an extensive country, is not a very productive one, and that Cornwall alone consumes three times as much gunpowder as the whole of Sweden. The sale of 221,900 lb. of nitro-glycerine in that country, equal to at least $2\frac{1}{2}$ million pounds of gunpowder, is therefore a proof of decided success. If the material had, over gunpowder, the advantage of cheapness, weight for weight, the demand might possibly be ascribed to futile and mistaken economy; but as 1 lb. of nitro-glycerine costs the miner as much as 8 lb. of gunpowder, it is evident that it must do some work or he would not have it.

It has no doubt greatly facilitated the introduction of nitro-glycerine into Sweden that the transportation, storage, and use of the quantity above-mentioned, has caused no accident of any serious nature, and positively a less total of minor accidents than if gunpowder had been used in its stead. That immunity from danger is, in all probability, due to the colder climate of Sweden, which allows of nitro-glycerine being transported, nearly all the year round, in a congealed state, its freezing-point being as high as 50°.

In this country nitro-glycerine, notwithstanding the strong dislike which generally prevails against it, has been constantly used in the quarries of North Wales since 1866, and is in high favour with the miners. Two quarries alone (Brynderven and Driwrwic) have up to this time consumed about £3000 worth of the material, or about nine tons;

and its remaining stationary in North Wales is owing only to the circumstance that the manufacture and sale of the article has not been, in this country, as in Sweden, an organized business.

The workmen in Wales pay for the material, which they consume, the price of 3*s.* 3*d.* per pound, while gunpowder costs only 4½*d.*, and if they continue to do so for years it proves that they derive a benefit from its use. Still a slate quarry is far from showing it at its greatest advantage, which can only become prominent in hard rock.

Whatever success nitro-glycerine has realized, it will certainly be admitted that it is not due to popular favour. No improvement has ever worked its way under a more crushing weight of opposition, and the very fact of its having stood it, is perhaps the best proof of its valuable properties. Gun-cotton, which has been repeatedly pushed for more than twenty years, has not been used for blasting in all that time as much as nitro-glycerine in six months. Why? because the miners had no advantage at all in using it.

In mentioning gun-cotton, it is but just to state that it has been highly improved of late by Professor Abel, I believe, and is sold now in a condensed state, in which it forms a good blasting agent, and ranks as such next to dynamite. Only a few years ago the attempts which I witnessed to make gun-cotton take the place of gunpowder appeared to me to be perfectly fruitless. Bulk for bulk it had less power, and that power was even more expensive than the powder which it was meant to supersede. A new explosive cannot be introduced when the economical advantages are on the wrong side; and is next to impossible to get adopted by miners unless the advantages are very great and of a payable nature. But compressed gun-cotton is decidedly superior to gunpowder as a blasting agent; and if it cannot compete with dynamite, it is only because the manufacturing cost of the latter is less, while it possesses at least three times more power, and effects a far greater saving of labour. Details are only a matter of time and improvement, while the intrinsic merits of a substance decide the place which it is to occupy.

Nitro-glycerine has of late been prohibited in Belgium. It is of no consequence now that a substitute of equal power and greater safety has been found, but, as a legislative measure, it is remarkable for its absurdity. It was issued by the Minister of Commerce immediately after the late accident at Quenast. The cause of that accident is unknown, and even if it should have been of such a nature as to render a prohibition desirable, it is quite unwarrantable to proceed without careful inquiry. Steam has caused plenty of accidents, and it is a wonder that philanthropic governments have not prohibited its use. They seem entirely to forget that every article, if it has some drawbacks, is capable of improvement, which is necessarily stopped by giving it the death-blow of prohibition. It is entirely opposed to the spirit of our age, and can only be looked upon as a useless and troublesome muzzle on our liberty of action.

In Sweden, also, a prohibition has lately been issued against nitro-glycerine, which, by many persons in this country, I understand, has been mistaken as referring also to dynamite. Such is not the case. The latter substance has simply been subjected to the same regulation as gunpowder, and that only, as it is plainly stated, until its properties have become better known, so as fully to warrant a more liberal legislation. Prohibitions, as a rule, are as little liked in Sweden as here, but in this instance it was issued at the instigation of the Stockholm Nitro-glycerine Company, and only with a view to greater safety, since the new explosive, dynamite, is considered fully equal to take its place.

For my part, I would never have petitioned for such a prohibition, there being something revolting to me in these forced leading-strings. It is very likely that the miners who have got used to nitro-glycerine, and have yet a little schooling to go through before they find out that dynamite is fully its equal, will raise a strong opposition against the measure, and I should not wonder if the Government was forced to withdraw it.

I know nothing, with the exception of, perhaps, a liability to spontaneous combustion, which could possibly warrant the absolute prohibition of a substance. Now as for nitrated organic compounds in general, it is a decidedly erroneous notion that there is any such drawback attached to them. That notion has sprung up in laboratories, because the chemist has no suitable means at hand for thoroughly neutralizing the adhering acid. It is well known that the continued action of nitric acid decomposes nearly every organic compound. It is therefore clear that unless nitrated compounds are rid of adhering nitric acid they will decompose in course of time. Hence we read

in nearly every chemical work that nitro-glycerine is gradually decomposed, deposing oxalic acid, while such a change has never occurred in the same article manufactured on a large scale. With suitable apparatus it takes less than one hour to completely neutralize a ton of nitro-glycerine; and, as a further control, a small quantity of every day's produce, after it has been well mixed, so as to be fully uniform, is sealed and kept for inspection. That practice has now been carried on for eighteen months, and shows not the slightest vestige of decomposition in any of the numerous samples.

Having to store large quantities, not only in six factories, but also in numerous depôts, it is but natural that I should have been anxious myself to investigate the matter. In the case of dynamite it is true that spontaneous combustion could mean only its catching fire and burning without explosion, since internal or external heating must naturally have the same effect; still spontaneous combustion, even where no explosion can ensue, is a serious evil.

Fortunately the tendency of organic compounds to decompose under divers influences increases so rapidly with the increase of temperature, as to render an investigation very easy without having to rely on the tedious experience of years. I kept a small quantity of dynamite for forty days and nights exposed in a current of heated air, the temperature of which varied between 140° and 200°, after which time it was found perfectly unaltered, only there was a loss in weight of about 2½ per cent. due to a slight evaporation of nitro-glycerine at that high temperature.

Adding to safety tests like this the circumstance that nitro-glycerine has now been stored in many factories and depôts for about four years, and in large quantities, without ever causing an accident or having been found to deteriorate, I think that there is ample proof of its stability. Nature, indeed, is not so treacherous as she is sometimes accused of being, and there are few substances, except those of a very complex composition, which cannot be stored without deterioration.

THE ROYAL COLLEGE OF SURGEONS OF EDINBUBGH.

At a meeting of this College, held on the 12th inst., it was stated by the President that a deputation had, on the 2nd inst., waited on the Lord Advocate in regard to the operation of "The Sale of Poisons and Pharmacy Act," passed during the last session of Parliament, and that he had since received a communication from his lordship, stating that the Act was not a Government measure, but was promoted by several members of Parliament, to whom the Government gave facilities, as it was considered, upon the whole, to be a good measure; that the striking out of the words "legally qualified practitioners," in clause 16, seemed to his lordship to inflict a hardship on medical practitioners in Scotland, of which they might justly complain. The Lord Advocate stated that it was probable the effect, in Scotland at all events, was not perceived, the Bill having been carried through hurriedly during the last days of the session. His lordship considered that, if the effect of it is to prevent a medical man from selling or dispensing medicines mentioned in Schedule A, the operation of it may be injurious to the population of the outlying districts in Scotland, who depend almost entirely on their medical attendants for a supply of medicines; and that if, upon further consideration, it be held that the 16th clause leads to the above result, his lordship was prepared to do what he could in order to get this matter put right. The President further stated that, having carefully examined the Act, in relation to the powers of the College granted by their various royal charters, and especially by the charter of 1851, which ordains and declares that the College may grant diplomas or licences qualifying their licentiates to exercise and enjoy all rights of practice in the arts and sciences of anatomy, surgery, *and pharmacy*, commonly enjoyed by the Fellows of the College, he was of opinion that the licentiates were thus constituted legally qualified apothecaries, and therefore that nothing contained in the Act extended to or interfered with their business. At the same time, to put the matter beyond doubt, the College resolved to procure the opinion of counsel, and also to take steps to co-operate with other licensing bodies in order to obtain an amendment of the Act, if necessary.—*Medical Times and Gazette.*

REVIEW.

PHARMACOPŒIA OF INDIA.

Prepared under the Authority of Her Majesty's Secretary of State for India in Council. By EDWARD JOHN WARING, M.D., *Member of the Royal College of Physicians of London, Surgeon in Her Majesty's Indian Army. Assisted by a Committee Appointed for the Purpose.* India Office. 1868. London: W. H. Allen and Co., 13, Waterloo Place, Publishers to the India Office.

The Pharmacopœia of India, as we are informed in the preface, has been prepared—

"With the view, firstly, of bringing to the notice of the profession, in India, those indigenous drugs which experience has proved to possess value as medicinal agents, and which may be employed as efficient substitutes for imported articles; and, secondly, of remodelling the Bengal Pharmacopœia of 1844. Her Majesty's Secretary of State for India in Council was pleased to sanction the publication of a Pharmacopœia for India, based upon the British Pharmacopœia, which, while affording all the information contained in that work of practical use in India, would embody and combine with it such supplementary matter of special value in that country, as should adapt it to meet the requirements of the Indian Medical Department."

In order to carry out these views, and to superintend the preparation of the work, the following Committee was organized:—

Inspector-General of Hospitals Sir J. Ranald Martin, C.B., F.R.S., *President;* Sir William O'Shaughnessy Brooke, M.D., F.R.S.; Alexander Gibson, Esq., F.L.S.; Daniel Hanbury, Esq., F.R.S., F.L.S.; Thomas Thomson, M.D., F.R.S.; John Forbes Watson, M.D., M.A., F.L.S.; Robert Wight, M.D., F.R.S.; Edward John Waring, M.D., M.R.C.P., F.L.S., *Editor.* From the above list of names it will be seen that the work has been prepared under the most favourable circumstances, and we naturally expect a volume worthy of the high reputations of the authors.

In carrying out the work entrusted to them, the Committee have, we think, exercised a sound discretion in adopting the double system of chemical notation as employed in the British Pharmacopœia, as also the weights and measures of that volume, for in such particulars there should be absolute uniformity in all Pharmacopœias published in the British Empire; though whether the best mode of arranging the materials at command has been decided upon will doubtless elicit some difference of opinion; but in order to give our readers a clear idea of the arrangement adopted, and the reasons which led to that arrangement, we will extract the following paragraphs from the preface:—

"The best mode of arranging the materials at command received at the outset the most careful consideration, and it was ultimately decided to divide the articles into two classes, viz., 'Officinal' and 'Non-officinal;' the first to include those articles officinal in the British Pharmacopœia, together with those indigenous products of India, whose claims as medicinal agents are established on a solid basis; the second, or Non-officinal list, to comprise a large number of articles whose reputation is not so well established, but which, possessing considerable activity, are deemed worthy of attention. In addition to these, there have been included a few drugs respecting which, either from their high repute amongst the natives, or from marked physical characters, it is desirable to obtain further information. Some of the articles in this class will doubtless, on trial, prove worthless, and will justly be discarded in future editions; whilst others, it is expected, will prove valuable remedial agents, and worthy of being eventually transferred to the officinal class.

"After much deliberation, it was likewise determined to depart from the alphabetical arrangements usually employed in Pharmacopœias, and to adopt one based on a scientific classification, as being better adapted for bringing to notice the numerous articles of Materia Medica to which it was deemed desirable to call attention.

"It was further resolved to depart from the old Pharmacopœia routine of furnishing a simple list of articles of Materia Medica, with their physical characters and preparations, and to supply information with regard to their medical properties, therapeutic uses, and doses; to form, in fact, a text book which might prove useful to the medical student, and it was hoped also, though, perhaps, in a minor degree, to the practitioner in remote stations where works on Materia Medica are not always available for reference.

"In accordance with these views, it was deemed expedient to place under each individual drug the preparations of which it formed the active ingredient. By this arrangement it is obvious that the various preparations are presented to view more conveniently than if they were inserted in detached portions of the work under the separate headings of Infusions, Tinctures, Extracts, and so forth. All difficulties with regard to reference are obviated by a carefully-prepared and extensive index.

"It was also decided to include in the present work *all* the drugs which are officinal in the British Pharmacopœia. Some of these, which require to be used in the fresh state, are, of course, unavailable in India; others, from readily undergoing decomposition at high temperatures, are unsuited for use in the tropics. These, together with a few minor articles, for which India yields sufficient substitutes, it was first thought might safely be omitted without detracting from the utility of the work to the Indian practitioner. But it was decided not to omit any of them; so that the student in India, where this work may be adopted as a text-book, will have brought before him, in due course, all the articles which are officinal in Great Britain, while the notes appended will indicate their value and applicability to Indian practice.

"In endeavouring to impart an educational character to the Indian Pharmacopœia, the Committee feel that they have taken the surest mode of carrying into effect one of the primary objects of the work, namely, the introduction of the indigenous products of India into European practice in that country. If they are ever to come into general use in hospitals and dispensaries throughout India, it is to the medical colleges and schools that we must look in the first instance. It is there that a correct knowledge of them should be first instilled; that the student should become familiarized with the articles themselves; that he should be made acquainted with their physical characters and medicinal properties; and it is there, during the period of student life, that he should become practically instructed in their employment in the treatment of disease. On the value of knowledge thus gained it is impossible to place too high an estimate, familiarizing, as it will, the embryo practitioner with remedies which are at hand in the remotest corners of our Indian empire, rendering him, in a great measure, independent of costly imported articles, and effecting a considerable annual saving to the State."

From the above extracts, it will be seen that the Pharmacopœia of India has more extended objects than the British Pharmacopœia, or of the pharmacopœias generally of Europe and America, for it is not only a pharmacopœia in the ordinary sense of the term, but is besides a treatise on Materia Medica and Therapeutics. Such to some extent was the scope of the Bengal Pharmacopœia, published twenty-four years ago, so that the plan of the present work is not without precedent in India. It is, moreover, we believe, the best arrangement, under all circumstances, for a pharmacopœia of our Indian empire, where works on Materia Medica are in some parts difficult to procure for reference. In carrying out this plan, however, we think the editor has been frequently unnecessarily minute in details, and has weakened the value of the volume by comprising in its pages the description of a number of drugs which are very unimportant, and of some even which, so far as experience of their use has hitherto shown, are entirely valueless. These remarks are, of course, intended to refer more especially to the non-officinal substances, but they also apply, to some extent, even to the officinal ones. We are not among those who would restrict too much the Materia Medica of a pharmacopœia, but, at the same time, we must avoid the greater mistake of over-burdening it with a number of untried or unimportant remedies as we think has been the case in the present volume.

The authors of the Pharmacopœia of India have also, in our opinion, given quite insufficient reasons for introducing into it *all* the drugs of the British Pharmacopœia, although most undoubtedly the more important which could be

readily obtained and preserved unchanged in India should have found a place; but to over-burden the work with notices of drugs which require to be used according to the directions of the British Pharmacopœia in a fresh state, and are, therefore, as a matter of course, unavailable, as the authors state, in India, as well as with others which readily undergo decomposition in hot regions, and also with those for which efficient substitutes exist in India, we regard as a mistake.

Although we have pointed out, as we believe, the blemishes of the volume, we can speak in an unqualified manner of the careful and able manner in which it has been generally edited. The volume is a mine of wealth for those who desire to become acquainted with the indigenous drugs of India, and we cannot but believe that as our knowledge of these becomes more extended, many of them but little known at present, but of undoubted efficacy, will find their appropriate place in the British and other Pharmacopœias of Europe and America.

At the end of the volume we have an extensive Classified Catalogue of Indian Medicinal Products derived from the Organic Kingdom, indicating those which are more or less analogous to articles officinal in the British Pharmacopœia, and for which they may be employed as substitutes. This list will be found most valuable to medical practitioners whose acquaintance with remedies is confined to those in use in this country, but who upon removal to India are obliged to resort frequently to such substitutes as can then be procured. The list will also be found most useful in guiding medical practitioners in their search for new remedies.

After the Classified Catalogue the Editor has inserted a very useful Appendix, which contains further important information respecting indigenous and other remedies; and at the end of the work we have an extensive and very carefully-prepared Index, which has been drawn up with the especial view of counteracting any difficulty which might arise in consequence of the preparations of the several drugs having been placed in the body of the volume under the head of each drug instead of in detached portions of the work under the separate headings of Extracts, Infusions, Tinctures, etc.

COLLECTION OF ORGANIC MATERIA MEDICA FOR THE MINOR AND MODIFIED EXAMINATIONS OF THE PHARMACEUTICAL SOCIETY.

In order to assist students in preparing for the above examinations, Messrs. Southall, Son, and Dymond, of Birmingham, have issued a collection of characteristic specimens of the roots, barks, flowers, fruits, leaves, resins, gums, etc., of the British Pharmacopœia, 1867. Each specimen bears a label containing a description of the source from which the article is derived, its Natural Order, characters and tests, dose, and the names of the Pharmacopœia preparations into the composition of which it enters.

Altogether 138 specimens of drugs are comprised in the collection, but the following ten specimens (being ordered in their fresh state), are omitted from the collection, namely:—*Aconiti folia*, *Armoraciæ radix*, *Ecbalii fructus*, *Lactuca*, *Laurocerasi folia*, *Limonis cortex*, *Rhœados petala*, *Rosæ caninæ fructus*, *Rosæ centifoliæ petala*, and *Sambuci flores*. Of the following nine, which are ordered both fresh and dried, only the dried specimens are included:—*Belladonnæ folia*, *Colchici cormus*, *Conii folia*, *Glycyrrhizæ radix*, *Hyoscyami folia*, *Rosæ Gallicæ petala*, *Sabinæ cacumina*, *Scoparii cacumina*, and *Taraxaci radix*. *Ficus*, *Prunum*, and *Uvæ* are also omitted; and the following five specimens being costly are likewise omitted, namely, *Castoreum*, *Crocus*, *Moschus*, *Opium*, and *Scammonium*; these latter specimens, however, will be supplied upon special application at their ordinary prices. The descriptive labels of all the above excepted specimens are, also, sent with the collection.

So far as we have been able to examine the collection, the specimens appear to have been very carefully selected, and well adapted for the purposes for which they are intended. We believe that this collection, which may be purchased at the moderate price of thirty shillings, will prove a real boon to students, more particularly at the present time, and especially to those who live beyond the reach of places where facilities for study are afforded.

We trust that the time is not far distant when collections of the more important officinal plants will be also as readily obtainable by students in this country as is now the case in Germany.

PREPARING FOR PUBLICATION.

THE MODIFIED EXAMINATION. By Frank Harwood Lescher. London: J. Churchill and Sons.

This work is intended, though in no degree to the exclusion of the standard text-books, to serve as a guide to the salient points in the several subjects comprised in the Modified Examination of the Pharmaceutical Society.

We are informed that it will be published about the middle of December.

TO CORRESPONDENTS.

A Correspondent (Wandsworth) observes that the working of the New Pharmacy Act will be injurious to our trading interests, seeing that, although the Legislature has given the public a safeguard in confiding the sale of poisons solely to an educated class, no provision is made for the additional tax on the time of the retail chemist in carrying out the provisions of the Act; and our correspondent suggests that an additional charge should be made in exchange for the trouble and care required in selling any of the poisons enumerated in the schedule.

Mr. Joseph Leay, Mr. Ernest Agnew, Mr. T. R. Prime, and "*An Assistant*" are thanked for their communications.

"*Flour of Meat.*"—We have received a sample of the "Concentrated Flour of Beef," in the manufacture of which considerable improvement has been effected by Dr. Hassall, rendering it more agreeable to the palate.

W. C. (Chard).—The provisions of the Act do not apply to Patent Medicines.

J. M. (Doncaster).—We are unable to give the information required.

"*Enquirer*" wishes to know the best means of removing rust from the inside of an iron spirit-of-wine vessel.

J. M. (Tuam).—Yes; the publication of Dr. Attfield's work was subsequent to that of the Pharmacopœia.

Q. D. E.—Chilblain Liniment. See Vol. IX. p. 47, and Vol. XII. p. 260.

"*A Subscriber*" (Leicester).—Yes.

P. H. M. (Norwich).—*Plocamium coccineum.* No analysis has been published, that we are acquainted with. Both Mr. Broughton and Mr. Howard have analysed the leaves of *Cinchona succirubra*, and obtained alkaloids from them, the latter, to the extent of 0·11 per cent., and the former found 3·1 grains in four pounds weight of the leaves.

Mr. Monaghan's communication is too long to be inserted.

G. A. (Berwick).—The "mechanical equivalent of heat" is the amount of work or mechanical force represented by a given amount of heat, these being found to bear an exact and uniform relationship to each other.

"*Apprentice*" (Neath).—The first is correct, but not the second.

S. B. (Eton), referring to the process in the British Pharmacopœia for mustard poultice, asks whether the use of water at 120° F. would not afford a more efficacious preparation than the boiling water which is ordered. He will find that the linseed meal is directed to be first gradually added to the boiling water, by which the temperature will be sufficiently reduced before adding the mustard.

"*Pharmaceutist*" (Blackburn).—Liable to stamp duty.

E. W. B.—(1.) Yes; read the latter half of clause 17. (2.) No. (3, 4, 5, and 6.) Yes.

J. H. (Spofforth).—No signature is required for dispensed medicines; see Clause 17.

J. B. (Northampton).—(1.) No. (2.) Reference to the Schedule will show of which poisons the preparations are to be retailed in the same manner as the poisons themselves.

J. C. (Bayswater) is surprised that "the wholesale assistants have not taken action with reference to the injustice of the clause in the Pharmacy Act which exclude them from registration under the 'Modified Examination.' Our correspondent suggests that a meeting of the trade should be held on the subject.

"*A Subscriber*" (Nottingham).—It will be necessary to pass the "Minor."

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. X.—No. VII.—JANUARY, 1869.

THE PHARMACY ACT OF 1868.

The year 1868 now becomes time past, and will take rank in the Pharmaceutical calendar as a red letter year; with 1841, in which the Society was first established; 1843, the year of incorporation by Royal Charter; and 1852, the date of the first Act passed by an English Parliament to place Pharmacy on an honourable and independent footing. The progress from one to the other of these periods has been steady; perhaps, as rapid as could reasonably have been expected, when we remember that in England it is in reality the voice of the public which says "ay," or "no," to the question of placing restrictions on any trade or calling exercised within the realm, and remember also the vast amount of that public which had to be convinced of the benefits to be derived from utilizing the efforts of the few men who stepped from their own prosperous, because well-conducted, shops in 1841 to create we might almost say, a race of Pharmaceutists worthy of this great country. Had there not been an utter abnegation of self, a fixed determination to avoid interference with private regulations for conducting trade, which could only be made properly by each individual according to the requirements of his own special position, and a resolve to make education the groundwork of the institution which our founders desired to establish, there would have been no Pharmacy Act passed in 1868 to prevent any but examined and certified persons hereafter dispensing medicines, however powerful or dangerous, for Her Majesty's lieges.

The Pharmacy Act, which at the commencement of 1868 was a thing *wished* for by all, but *hoped* for only by the sanguine, is now an accomplished fact. This accomplishment, however, must not be considered as a completion of their work by those who have laboured to promote it.

A Statute, as it issues from Parliament, is seldom that perfect piece of legislation which men expect it to be, and is rarely, if ever, agreeable to all parties. It is an old saying, that "a coach and four may be driven through any Act of Parliament," but if some of our contemporaries are to be believed, there is no passage even for a single horseman through the Pharmacy Act. This is all natural enough. The framers of a Bill having a certain object in view, looking at that object from all points, introduce with their enactments qualifications where needed. Members of Parliament, on the other hand (with all reverence be it spoken) think too often of particular details only, and introduce amendments which, although excellent perhaps in themselves, are not "in gear" with the rest of the Bill. It generally, however, happens that the whole may be made

to harmonize, or at least to work, by the aid of a little common sense on the part of those who have to interpret the law, and no man can do that properly without first mastering its object. In the present case, we have no doubt that many of the threatened difficulties will vanish as the Act comes fairly into operation. The first, and the one put forth most prominently because it seemed to affect a very powerful and important class, was the grievance of the medical profession. The 'Lancet,' on the part of English Physicians and Surgeons, acting as general practitioners without a qualification from the Society of Apothecaries, declared that such men could not even dispense medicine for their private patients without infringing the law. The Scotch Surgeons as a body (there being no Licentiates of the Society of Apothecaries in Scotland) raised a cry of alarm lest they should be deprived of the right of keeping open chemists' shops, and resolved, with true north country wisdom, to take Counsel's opinion on the question. They have done so, and the result, as may be seen from the "opinion" cited in another part of this Journal, entirely confirms the interpretation of the Act which we put forth last month as the true one, namely, that all men who have been examined in Pharmacy, and declared qualified to practise it by any licensing board recognized by the Medical Council of Great Britain, whether the Society of Apothecaries or not, are "de facto" Apothecaries within the scope and meaning of the Statute, and are consequently exempted from the operation of its first fifteen sections. This will, we hope, allay the fears of the profession who in the main approve the Pharmacy Act, and entirely acquit the Pharmaceutical Society of any desire to curtail their rights or privileges.

Other persons, themselves Chemists and Druggists, have protested against the absurdity of applying the word poison alike to strychnine and paregoric, to cyanide and ferrocyanide of potassium. The necessity, or apparent necessity, for so wantonly destroying the value of the word "Poison" arises from another of those amendments on the original Bill in the House of Commons to which we before alluded. But those who introduced it, introduced also an antidote to the bane, by giving power to the Society, with the approval of the Privy Council, to make regulations for the sale of poisons. Such regulations are, we know, at this time under the consideration of the Privy Council, and, but for the interruption to official business caused by the change of ministry, would have been ready for insertion in this number of our Journal. We still hope to have them in time to accompany, if not form part of it. We believe those regulations will be so precise and simple in their character as to remove any inconvenience and uncertainty which are at present anticipated by Chemists and Druggists, and to increase the safety of the public by a common sense rather than a stilted reading of the seventeenth section. We are able thus generally to characterize these proposed rules, although we regard it a matter of duty and policy not to mislead our readers by giving details which may yet be altered.

The twenty-fifth section of the Pharmacy Act of 1868 transferred the power vested by the statute of 1852 in "one of her Majesty's Principal Secretaries of State" (and formerly exercised by the Home Secretary) to the Privy Council, the department in which all matters relating to the public health are conducted; and we believe the officials there have an earnest desire to maintain the Pharmaceutical Society in honour and efficiency for all time.

With this view, and having regard to the different relationship in which the Society will hereafter stand towards the public, certain suggestions have been made by the Lords of the Privy Council for amendments in the Bye-laws, now that those laws are under consideration. These changes have occasioned considerable delay, and the necessity for again going through the whole question in a general meeting, as will be seen by the Secretary's notice. The

laws themselves, as now proposed, are inserted *in extenso* in another part of this Journal.

We might name other points of doubt or difficulty, but we believe they will be easily solved, and we think we have already said enough to convince the promoters of the Pharmacy Bill that their work is not yet complete. They have achieved a great success; if they now proceed in the spirit which guided them in 1868 in obtaining their Act, to bring it into good working order, they will earn for themselves the thanks of the public as well as of the trade.

AN APOLOGY FOR LATIN.

BY JOSEPH INCE.

The subject here presented is of the deepest and most urgent importance. I implore those who have under their care apprentices, or others who may hereafter seek a living by what is called Pharmacy, not to be led astray respecting this matter.

It is not intended, because special stress is laid upon one point, to disparage the usual branches of a liberal education. We are Englishmen, and must learn to read and write correctly the language which we speak, as well as to be conversant with the works of those who have made us proud of our nationality; but it is my object to demonstrate the evil consequences entailed by the neglect of a particular study. Recent examinations and the confession of many who are anxious to prepare themselves, have shown how incalculable is the help to be derived from an early moderate acquaintance with the classics, due not only to positive knowledge gained, but to an enviable facility of concentrating mental power. I have no wish (save for the marvellous pleasure of the thing, and its gilding of the monotony of life) to recommend the study of Virgil, Horace, Livy, and Cicero; still less to become romantic and utopian in praise of Greek; but it cannot be denied that such studies form a mental training which men with easy fortunes may neglect, but the loss of which we, as pharmacists, who have to gain a living, cannot possibly afford.

Why is Latin thus prominently introduced? Is it sought by a trick of literature, or by an affectation of profound scholarship, to write sensational sentences?

A new existence opens out for pharmacy, higher and better than the past; a career for which we may prepare our sons without sense of social degradation. But excelsior status can only, though secured officially, be supported by corresponding fitness.

Now Latin strikes at the root of the superficial—its teaching cannot be guessed at: in itself as a commencing study, it is utterly unattractive. Every word means something, no one noun or adjective can be substituted for another. *Vir* is man, and so is *homo*, in English, not in Latin. To grasp its elementary principles nothing but close attention and thoroughness of labour will avail. A youth scarcely fledged—given a certain amount of cleverness and self-sufficiency, can soon theorise and discourse in a popular manner about most other things; the mysteries of religion are explained on Sunday afternoons by young gentlemen in the Regent's Park, to an admiring family audience and one London Member of Council, whilst the novice easily becomes familiar with the run of scientific experiments in a manner which (unhappily for himself) may astound the listener as much as the Fellows of the Royal. But Latin is imperative in its demands: a page of Ovid or of Sallust is a battle-field which must

be conquered, and nothing can avail the combatant but work. The truer the work, the greater the success.

This earnest strife is in itself the foundation of future excellence. When hexameters and pentameters are forgotten, when it is no longer of the smallest consequence whether the first and second Punic wars are hopelessly confused, when Julius Cæsar, may with impunity be mistaken for Augustus, when the fourth Georgic may have ceased to charm, and the Eclogues are as little remembered as the Sic te Diva, still the result remains—one for which the student, especially the Pharmacist, may thank God every day of his after life. There is left the gift of accurate, minute investigation; the contempt for clap-trap and superficiality; the longing for and realization of the possession of abstract knowledge; the capability at a given instant of directing trained energy in any desirable direction.

There is, moreover, a release from the tyranny of desultory endeavour; from the waste of time and plodding spent in praiseworthy but mistaken approach to work in hand. Finally, to a mind thus exercised there is the dowry of that innate command of thought and consequent action which eventually will prove the surest hold upon the reins of business, and will at least rob our examinations of their last trace of terror.

On the other hand, speaking with the utmost deference, physical and general science, with all their attractions, may largely supplement, but will never supply the place of a dead language in an educational point of view. This is written simply respecting Pharmacists, to whom opportunity of long-continued scholastic training is denied; for *us* the mainspring is essential, we must wait for the jewelled holes and ornamentation. Few years on an average are allotted to our book-learning; the world steps in too soon, but of necessity, and business must be attended to. The first thing to be done with a boy who knows nothing, and has comparatively little time, is so to discipline his thought that he may be able to learn something, indeed, *any*thing, hereafter to advantage.

Let the matter be divested of idealism. How marvellous are the wonders chemistry unfolds! how grand the progress of physical science, and how incalculable the material blessings it bestows! how the mind is lost in love and admiration while engaged in any branch of natural research! Then why not teach these things in our schools, nor let the stripling waste his precious time over dactyls and spondees, or on being expert in Sapphics? Simply because *our* school-time is very short.

For these pursuits, which are the perpetual delight of thousands in after life, the scholar at the age alluded to cares less than the wind that whistles; cares far more for a boxwood top with plenty of string, and warranted to spin. If he can, by the position of his parents and favouring circumstances remain at school long enough that his mind gradually wakes up to the siren voice of nature, so much the better; offer him the fullest opportunities. Such is not the usual happiness of a druggist's son. Even then I would repeat my earnest entreaty that no father or guardian should be persuaded to neglect that most obvious, safe, and effectual preparation, acquaintance with the Latin language.

Those who consider a school a granary of useful facts, and *that*, the best from which the most are borne away, oftener than not must meet with experiences they cannot understand. Those who are under the impression that the schoolmaster waves an enchanted wand, with which he transmutes his pupil into a ready-made Sir Isaac Newton, or that in the limited time allotted he can give an insight into things in heaven above and in the earth beneath, occasionally will be disappointed. We shall not stray far if we follow the track which the wisdom of our ancestors has pointed out.

Many just now are seeking to qualify themselves for examination—the will is present and the strong desire. No mentor is wanted to give counsel on the

value of time well occupied. Then comes the disheartening truth, coupled with the bitter discovery how hard it is to force the undisciplined mind to answer, when bidden, to the work required. Add to this the distraction of business engagements, late hours, and some amount of exhaustion. No praise can be too high when such difficulties are surmounted.

The subject is placed, without reservation, briefly but conscientiously before the reader. Soon we shall have text-books inspired by the laudable ambition of bridging over a neglected education. These guides are good for those who need them, but they are not to be accepted in place of systematic study. Their writers would be among the first to say that while crutches were useful for the lame, legs were to be preferred.

Sound (not necessarily advanced) scholarship is the royal road to Pharmacy or to any other conceivable branch of learning; it breaks down future difficulty, gives certainty in all subsequent work and self-reliance. Before it the technicalities of those twin stumbling-blocks, Chemistry and Botany, disappear; and yet out of fifty Pharmacists who offer themselves for a modified examination, it will happen that not ten can read a physician's recipe in the language in which it is written. I should be grieved in the most serious manner were this sentence to be interpreted as either ill-natured or sarcastic—the fact is mentioned only in order to express a feeling of personal sorrow as to the amount of effort implied in *thus* passing the ordeal.

Mathematics, by parallel mode of reasoning, may be said to produce identical results; but to many they are a sealed book. Let us not dilute our energies in fighting over the relative merit of classics and mathematics; whether one or the other be preferred, let us agree upon the one main point. Give the key to knowledge, a trained and disciplined mind, and fear not but that the student entering on life will thus be best prepared to unlock whatever door a kind Providence may offer.

SUPPLEMENTARY BENEVOLENT FUND.

In connection with the election of annuitants on the Benevolent Fund, a system has been adopted in some places which we think is worthy of a brief notice, especially at this period of the year. A correspondent at Birmingham has sent to the Secretary a supplementary list of subscriptions "for the unsuccessful candidates." A few pounds have thus been subscribed in small sums in that locality, and if the same thing were done elsewhere a very acceptable contribution might be thus made, which would tend to mitigate the feeling of disappointment after the excitement of an election. We strongly commend the example of Birmingham in this respect as worthy of imitation.

TRANSACTIONS

OF

THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF COUNCIL, *December 2nd*, 1868,

MR. SANDFORD, PRESIDENT, IN THE CHAIR;

Present—Messrs. Abraham, Bottle, Bourdas, Carteighe, Deane, Evans, Haselden, Hills, Morson, Randall, Savage, Squire, Stoddart, and Williams,

The following, having paid their arrears and their subscriptions for the current year, were restored to Membership:—

Matthew Pound .....London.
William Darling .....Manchester.
Morley Thompson .....Lewisham.
William Henry Tuck .....Gosport.
David Rogers .....Bexley Heath.

Resolved,—That no application for the separate Examination be received after 31st July, 1869, and that notice of such be announced in the Journal.

A communication was received from the Privy Council, taking exception to, and submitting to the further consideration of the Council, some points in the bye-laws previously to their, the Privy Council, confirming the said bye-laws.

SPECIAL MEETING OF THE COUNCIL, *December 21st*, 1868,

MR. SANDFORD, PRESIDENT, IN THE CHAIR;

Present—Messrs. Bottle, Bourdas, Carteighe, Deane, Evans, Haselden, Savage, Standring, and Williams,

The proposed alterations in the Bye-laws were considered, and notice for a Special General Meeting of the Society was fixed for the 14th of January, at 12 o'clock, for the purpose of approving and confirming the same.

Memorials were received from the Assistants to Wholesale Houses in London and Manchester in reference to the 4th Section of the Pharmacy Act, 1868.

EXAMINATIONS IN LONDON.

MODIFIED EXAMINATION, *December 11th*, 1868.

Present—Messrs. Bird, Cracknell, Darby, Davenport, Deane, Edwards, Evans, Gale, Garle, Haselden, Ince, Southall, and Squire.

Fifty candidates presented themselves for examination; the following forty passed, and were duly registered as

CHEMISTS AND DRUGGISTS.

Abernethy, John.....Hinckley.
Ashford, Evan Charles .....Northampton.
Bently, William James .....London.
Bingham, Samuel .....Eton.
Bourne, William Kemsey .....Coventry.
Bridgman, William Louis .....London.
Brothers, Francis .....Folkestone.

Brothers, John .....Ashford.
Cooke, William Marcus .....Kidderminster.
Croston, John .....Atherton.
Dalton, Francis .....London.
Finch, Thomas .....London.
Fuller, John William .....London.
Graham, Monkhouse .....Cambridge.
Greenwood, John Tatam .....Louth.
Grummitt, William Clarke.....Market Deeping.
Halliday, Henry Dudeney.....London.
Hartness, Isaac .....Whitehaven.
Hey, Walter Thomas.....London.
Huggins, Edward John .....Wainfleet.
Jeffcoat, James .....Canterbury.
Kay, Robert .....London.
Kneen, George Francis .....London.
Morrell, Frederick Kent.....London.
Morris, John C. B. .....Brecon.
Musgrave, John Critchell .....Torquay.
Pughe, Rice Owen.....Carnarvon.
Reedman, William Henry .....Crawley.
Ridgway, Thomas Eyton .....Liverpool.
Robinson, Herbert .....Clifton.
Saunders, Charles .....London.
Stansfield, Robert Wright .....Stockport.
Tatnell, Daniel Clinch .....Ashford.
Tunbridge, Frederick.....Great Yarmouth.
Vaughan, William George.....London.
Walker, William Henry.....London.
Watson, Charles.....London.
Wavell, Edward .....London.
Wilkinson, Robert Beeson .....London.
Wood, James .....Wakefield.

December 16th, 1868.

Present—Messrs. Bird, Carteighe, Cracknell, Darby, Davenport, Deane, Edwards, Evans, Gale, Garle, Hanbury, Haselden, and Squire.

Thirty-two candidates presented themselves for examination; the following twenty-four passed, and were duly registered:—

MAJOR (as Pharmaceutical Chemists).

Blackwell, Frederick .....Lyme Regis.
*Butten, Joseph .....Penzance.
*Ellis, Henry Brook.....Bristol.
George, William.....Newcastle Emlyn.
*Martin, Nicholas Henry.....Penryn.
Pafford, Walter Haideen .....Niagara.
*Smart, Alfred .....Littlehampton.

MINOR (as Chemists and Druggists).

Banister, Charles William.....Liverpool.
†Beedzler, John .....Peterborough.
†Brown, Arthur Mavor .....Bury St. Edmund's.
Budden, William .....Wimborne.
Capper, John .....Woolwich.
†Cossey, James Davis .....Norwich.

* Passed in honours; eligible at the end of the Session, to compete for the Pereira Medal.
† Passed in honours; eligible, at the end of the Session, to compete for the Prize of Books.

Earl, Edward	Sutton Bridge.
Ekins, Charles	Lincoln.
*Forbes, William Thomas	Reigate.
*Harper, John	Leamington.
Haswell, Joshua Edwin	Helston.
Jenner, Charles Samuel	Bury St. Edmund's.
Lincoln, John Thomas	King's Lynn.
*Payne, Ebenezer Stewart	Leeds.
Pollard, John Frederick	Liverpool.
Sharples, Charles Heaton	Preston.
Turner, John	Morpeth.

REGISTERED APPRENTICES AND STUDENTS.

Name.	Address.	
Adams, Thomas Johnson	Messrs. Harvey and Quibells	Newark.
Appleby, Calvert	Mr. Appleby	East Retford.
Austin, Samuel John	Mr. Lewin	Boston.
Botterill, George Thomas	Mr. Lamplugh	Boston.
Collins, John Stratford	Mr. Woods	Worcester.
Dainty, Robert Burbridge	Mr. Smith	Sutton Coldfield.
Davis, James Edward	Mr. Humby	Warminster.
Ellis, George	Mr. Ashton	Southport.
Ellwood, Michael John	Messrs. Mawson and Swan	Newcastle-on-Tyne.
Freestone, Robert Henry	Mr. Fardon	Bristol.
Glover, Joseph Imison	Messrs. Mawson and Swan	Newcastle-on-Tyne.
Grant, Jabez	Mr. Grant	Southery.
Greenway, Charles M.	Mr. Bangham	Ashby-de-la-Zouch.
Griffith, Francis	Mr. Griffith	Weston-super-Mare.
Ham, Henry	Mr. Brend	Swansea.
Hamond, Joseph	Mr. Willson	Peterborough.
Hanbury, Frederick Janson	Messrs. Allen and Hanburys	London.
Hearn, John	Mr. Wm. Jones	Liverpool.
Huband, Wm. Woodward	Mr. Uppleby	Leamington.
Humphries, Edgar	Mr. Smith	Sutton Coldfield.
Jeckell, Edward		Ipswich.
Keen, Benjamin	Mr. Hope	Uppingham.
Kemble, James	Mr. Dunn	St. Austell.
Knight, Geo. James	Mr. Spreckley	Newark.
Mann, Samuel William	Mr. Long	Bristol.
Milton, Thomas, jun.	Mr. Kinch	Henley-on-Thames.
Normand, Claude		London.
Outred, Thomas Benjamin	Mr. Cole	Colchester.
Pound, Henry William	Mr. Pound	London.
Righton, James	Mr. Ashton	Southport.
Rolson, James Crosby	Mr. Williamson	Darlington.
Saunders, Charles Price	Mr. Saunders	Haverfordwest.
Scoon, John	Messrs. Davies and Shepheard	Chester.
Short, William	Mr. Davis	March.
Smailes, Thomas	Mr. Pennington	Bury.
Smallman, Edward Briton	Mr. Oates	South Shields.
Sneath, Thomas Dixon	Messrs. Harvey and Quibells	Newark.
Stokes, Benjamin Maidens	Mr. Pilley	Boston.
Thompson, William Frederic	Mrs. Chantry	Goole.
Ward, Charles Thomas	Mr. Ward	London.
Ward, John	Mr. Hope	Uppingham.
Williams, Charles H.	Mr. Cross	Cardiff.

* Passed in honours; eligible, at the end of the Session, to compete for the Prize of Books.

ADJOURNED MEETING, *December 17th*, 1868.

Present—Messrs. Bird, Davenport, Deane, Edwards, Gale, Garle, and Haselden.

The following presented themselves for Examination, and passed, and were duly registered:—

MINOR (as Chemists and Druggists).

Bowen, Thomas Henry .....London.
Byles, James Henry .....London.
*Clarke, James Thomas .....Altrincham.
*Crossby, Richard Summerby.....Grantham.
Durrant, George R.....East Grinstead.
Fripp, Percival Kossuth .....London.
*Goodwin, Felix .....Newark.
Heslop, John .....London.
Mackmurdo, Walter George .....Dunmow.
Rawlinson, Ralph .....London.
Sykes, Edwin John.....Bakewell.
Thomas, John Rush .....London.
*Truman, Frank Wilton .....Jersey.

MODIFIED EXAMINATION, *December 18th*, 1868.

Present—Messrs. Bird, Cracknell, Davenport, Darby, Deane, Edwards, Gale, Garle, Haselden, and Southall.

Forty-seven candidates presented themselves for Examination; the following thirty-nine passed, and were duly registered as

CHEMISTS AND DRUGGISTS.

Abel, John Samuel .....Saltney.
Allman, John Dowling .....London.
Andrewes, Henry Manning .....London.
Atkins, John .....Birmingham.
Baldwin, Frederick George .....Greenwich.
Barnaby, Francis.....Manchester.
Bateman, John .....Whitehaven.
Brigstocke, James .....London.
Buchner, Maximilian .....London.
Callaway, James .....London.
Cashmore, Henry .....Birmingham.
Caunt, William Frederick .....Lower Tranmere.
Chalmers, David .....Manchester.
Crozier, Robert .....Garstang.
Darch, Augustus .....Woolwich.
Davies, David .....London.
Davies, Robert.....London.
Everett, Henry .....London.
Everson, Henry Collins .....London.
George, Enos .....Fishguard.
Hackney, William Francis.....London.
Hardy, John, jun. .....Ewerby.
Hedley, John .....London.
Hill, Alfred .....Norwich.
How, Randal Edward.....Thame.
Jones, Enoch Henry .....Bristol.
Kenyon, Septimus .....Maidstone.
Leaver, William Henry .....London.
Masters, Henry Joseph .....Bath.
Murray, George Balfour .....London.

* Passed in honours; eligible, at the end of the Session, to compete for the Prize of Books.

Powell, Thomas .....Fairfold.
Priest, Albert Richard .....London.
Roper, Thomas Hill .....Ross.
Roulston, Benjamin Wilson .....Goole.
Sargeant, Samuel.....London.
Seyde, Francis Napier .....Willenhall.
Wheeler, Frederick William .....Bedford.
Whitby, John .....Stratford-on-Avon.
Worth, Richard Teague .....Penzance.

December 22nd, 1868.

Present—Messrs. Bird, Carteighe, Davenport, Deane, Edwards, Gale, Garle, Haselden, and Squire,

Nineteen candidates presented themselves for examination; the following eighteen passed, and were duly registered as—

PHARMACEUTICAL CHEMISTS.

Bartley, George Aloysius .....Bristol.
Baxter, Robert .....Huntingdon.
Bayley, Joseph Thomas.....Brownhills.
Cheese, Henry .....Coleford.
Gill, Levi John .....London.
Hatch, Richard Melanethon .....Bristol.
John, David William .....Pembroke.
Johnstone, Charles Andrew .....Manchester.
Martin, Frederick Robertson .....Bristol.
Nurthen, Frederick Richard .....London.
Parsons, Frederick .....Leicester.
Thompson, Thomas .....Guildford.
Turner, John .....Aylesbury.
Walton, William.....Manchester.
Ward, George .....Leeds.
Ward, William .....Sheffield Moor.
Yewdall, Edwin .....Leeds.
Young, John .....Newport, Monmouth.

EXAMINATIONS IN EDINBURGH.

November 19th, 1868.

MAJOR (registered as a Pharmaceutical Chemist).

Heron, James .....Edinburgh.

MINOR (registered as a Chemist and Druggist).

Finlay, James L. .....Edinburgh.

December 3rd, 1868.

Present—Messrs. Aitken, Brown, Buchanan, Kemp, Mackay, and Young.

Ten candidates presented themselves for examination; the following six passed, and were duly registered:—

MINOR (as Chemists and Druggists).

Blyton, John .....Liverpool.
Dodwell, John .....London.
Fitzgerald, Anthony.....Edinburgh.
Kennedy, Adam .....Edinburgh.
Patten, Samuel G. .....Alnwick.
Peebles, John .....Greenock.

MODIFIED EXAMINATION.

Eight candidates presented themselves for examination, and passed, and were duly registered as

CHEMISTS AND DRUGGISTS.

Buchanan, Dugald .....Greenock.
Dempster, Andrew .....Edinburgh.
Johnston, Alexander Edie .....Glasgow.
Purves, Samuel .....Edinburgh.
Smeaton, William Burnet .....Edinburgh.
Stewart, James Dickson .....Edinburgh.
Talbot, Andrew.....Greenock.
Thomas, Evan .....Edinburgh.

December 10th, 1868.

Present—Messrs. Ainslie, Aitken, Brown, Kemp, Mackay, and Young.

Four candidates presented themselves for examination, and passed, and were duly registered as under:—

MAJOR (as a Pharmaceutical Chemist).

Gilmour, Andrew.....Burntisland.

MINOR (as Chemists and Druggists).

Anderson, James L. .....Leith.
Millar, W. C. .....Glasgow.
Stewart, Robert .....Edinburgh.

MODIFIED EXAMINATION.

Fourteen candidates presented themselves for examination; the following thirteen passed, and were duly registered as

CHEMISTS AND DRUGGISTS.

Aitken, Alexander .....Dalkeith.
Alexander, William .....Edinburgh.
Armitage, George .....Greenock.
Black, James Hall .....Glasgow.
Dougall, David .....Edinburgh.
Dunn, Thomas .....Selkirk.
Geddes, George .....Aberchirder.
Harley, James.....Edinburgh.
Manson, Joseph .....Edinburgh.
Philip, Charles .....Leith.
Savege, Henry.....Brechin.
Shearer, David Brown .....Glasgow.
Stewart, John .....Glasgow.

December 17th, 1868.

Present—Messrs. Ainslie, Aitken, Brown, Buchanan, Kemp, Mackay, and Young.

Six candidates presented themselves for examination; the following five passed, and were duly registered:—

PHARMACEUTICAL CHEMISTS.

Cumming, Charles.....Edinburgh.
Davidson, James Noble.....Elgin.

MINOR (Chemists and Druggists).

Leitch, William.....Edinburgh.
Ross, William R. .....Dundee.
Scott, James .....Edinburgh.

REGISTERED APPRENTICE.

Fairley, James .....Leith.

MODIFIED EXAMINATION.

Fourteen candidates presented themselves; the following thirteen passed, and were registered as

CHEMISTS AND DRUGGISTS.

Bogie, Thomas.....Coupar-Angus.
Bruce, William Keiller .....St. Andrew's.
Fisher, Thomas, jun. .....Greenock.
Fleming, John.....Hamilton.
Galbraith, Walter Sloan.....Glasgow.
Gray, Ebenezer Hay .....Edinburgh.
Halley, Alexander .....Glasgow.
Inglis, James .....Glasgow.
Mitchell, Lewis .....Aberdeen.
Munro, Robert .....Edinburgh.
Raff, James .....Edinburgh.
Ranken, John .....Forfar.
Robertson, William Gardiner .....Edinburgh.

December 24th, 1868.

Present—Messrs. Ainslie, Aitken, Brown, Buchanan, Mackay, and Young.

MODIFIED EXAMINATION.

Eight candidates presented themselves; the following six passed, and were registered as

CHEMISTS AND DRUGGISTS.

Alexander, William Black.....Edinburgh.
Borthwick, Alexander John .....Kelso.
Clark, Andrew.....Edinburgh.
Morris, Alexander .....Dunfermline.
Reekie, Arthur .....Loanhead.
Robb, James .....Glasgow.

REGISTERED APPRENTICES.

NAME.		ADDRESS.
Davidson, William		.....Edinburgh.
Mackay, George Duncan	Mr. Mackay	.....Edinburgh.
Symington, Thomas		.....Edinburgh.

BENEVOLENT FUND.

SUBSCRIPTIONS AND DONATIONS RECEIVED DURING NOVEMBER AND DECEMBER.

SUBSCRIPTIONS.

LONDON.

	£.	s.	d.
Edwards, T. H., 58, Lambeth Walk	0	5	0
Farnfield, W. E., Lambeth	1	1	0
Jozeau, Gabriel, 49, Haymarket	0	10	0
Manley, Wm. Fredk., Peckham	0	10	6
Marshall, C. E., 67, Bedford Street, Mile End	0	5	0
M'Call, Edward W., 4, Kenno-way Terrace, Brixton	1	1	0
Nayler, J., 3, High Street, Bow	0	2	6
Potter, W. S., Plaistow, E.	0	5	0
Walker, W. H., 50, Compton St.	0	5	0

COUNTRY.

	£.	s.	d.
Aberayron, Jones, J. P.	0	10	6
Aberdare, Thomas, William	0	10	6
Alton, Monk, Albert Jeffery	1	1	0
Aylesbury, Turner, John	0	10	6
Bala, Jones, Thomas	0	10	6
Banff, Ellis, Bartlet	0	10	6
,, Low, Joseph	0	5	0
Barnoldswick, Livsey, Norman	0	2	6
Barton-on-Humber, Ingoldsby, William	0	2	6
Bath, Candy, William Gilbert	0	10	6
,, Ekin, Charles	1	1	0
Bethel, Williams, Hugh	0	10	6
Binbrook, Maughan, Samuel	0	10	6
Birmingham, Robinson, Eardley	0	10	6
,, Snape, Edward	0	5	0
Bishop Auckland, Armstrong, J.	0	2	6
Bishop Stortford, Speechly, Geo.	0	10	6
Bradford, Faull, John	1	1	0
Bude, Pellow, Bros.	1	1	0
Burton-on-Trent, Barnett, Jos.	1	1	0
Bury St. Edmund's, Hardwicke, J. E.	0	10	6
Caistor, Capes, George Test	0	5	0
Cambridge, Gillett, Crabb	0	10	6
Cardigan, Evans, John	0	5	0
Cullen, Seivwright, George	0	10	6
Deal, Clarabut, John Blaxland	0	10	0
Denly, Pym, J. William	0	5	0
Dorking, Clark, William W.	0	2	6
Douglas, Brearey, William A.	0	5	0
Dudley, Wilson, Rich. Bowes	1	0	0
Edinburgh, Brown, D. R.	1	1	0
Eltham, Rix, William	2	2	0
Faringdon, Ballard, Arthur	0	10	0
Gloucester, Curtis, Albert	0	10	6
Goole, Roulston, B. W.	0	10	6
Gosport, French, Benjamin	0	10	6
Gravesend, Drury, George S.	1	1	0
Grays, Soole, John Henry	0	10	6
Great Bedwin, Gerard, G. Rich.	0	5	0
Great Yarmouth, Walpole, W.	0	10	0
Heckmondwike, Stead, Walter	0	10	6
Helston, Wakeham, Charles	0	5	0
Holme-on-Spalding-Moor, Hudson, Herbert	0	10	0
Hunstanton, Twiss, William	0	10	0
Insch, Macmillan, William	0	7	6
Keith, Turner, William	0	5	0
Leamington, Barnitt, John	0	10	6
Leeds, Brooke, Thomas	0	10	6
,, Hurst, John Andus	0	10	6
Leith, Wilson, James	2	2	0
Leominster, Davis, D. F.	1	1	0
Liverpool, Haywood, Charles	0	2	6
Liverpool, Roberts, Hugh	0	2	6
Llandyhil (*Tregroes*), Evans, David	0	10	6
Llanegryn, Pugh, Hugh	0	2	6
Long Bennington, Bemrose, John	0	10	6
Maidenhead, Thompson, Chas. H.	2	0	0
Malton, Horsley, William	1	0	0
Manchester, Skellon, William	0	2	6
Millbrook, Rowe, Samuel	0	10	6
Minehead, Williams, Chas. E.	0	5	0
Oldbury, Briggs, George	0	10	6
Pensnett, Machin, Mrs. H.	0	5	0
Portsoy, Clark, James	1	1	0
Rhyddyan, Hughes, Robert	0	10	0
Rochdale, Bamford, J. W.	1	1	0
Rothiemay, Pirrie, Charles	0	5	0
Ruthin, Lloyd Brothers	0	5	0
Rye, Smith, A. W.	0	10	6
Sandbach, Clisby, S.	0	10	6
,, Gilbert, S.	0	5	0
Selkirk, Dunn, John	0	10	6
Settle, Tatham, John, and Son	0	10	6
Seymour, *Victoria*, Henshall, Samuel H.	0	2	6
Southend, Wheeler, James	0	10	6
St. Helen's, Thompson, Robert	1	0	0
St. Neot's, Dring, William	0	10	6
Stapleford, Barton, W. and J.	1	0	0
Streatham, Robinson, Chas. J.	0	7	6
Sydney, *Gloucester*, Smith, John	0	10	0
Troedyrhiw, Jones, William	0	5	0
Ulverston, Cooper, William	0	2	6
Wallingford, Payne, Sidney	1	1	0
Warrington, Whitby, John	0	5	0
Welwyn, Lawrance, Edmund	0	11	0
Wimbledon, Collier, James	0	5	0
Worksop, Scaife, Christopher T.	1	1	0
Wrexham, Rowland, William	1	1	0
Wyke, Drake, William	0	2	6
Yeovil, Manning, Thomas D.	1	1	0
Yspytty, Davies, Thomas	0	7	6

DONATIONS.

	£.	s.	d.
Balcomb, John, *Cheltenham*	2	2	0
King, Frederick R. M., *Gorleston*	2	2	0
Wynn, Frederick, *Horsforth*	0	10	6

PHARMACEUTICAL MEETING.

Wednesday, December 2nd, 1868.

MR. T. N. R. MORSON, IN THE CHAIR.

The Minutes of the previous Meeting having been read, the following

DONATIONS TO THE LIBRARY AND MUSEUM

were announced, and the thanks of the Meeting given to the respective donors thereof:—

Smithsonian Report for 1866,—Hildreth's Results of Meteorological Observations: from the Smithsonian Institution,—Guy's Hospital Reports for 1867: from the Hospital,—Medico-Chirurgical Transactions, vol. li.: from the Medical and Chirurgical Society,—Proceedings of the British Pharmaceutical Conference: from the Conference,—Withering's Arrangement of British Plants, 4 vols: from Mr. Deane,—Phillips' Remarks on the London Pharmacopœia,—Bate's Dispensatory,—Quincy's Dispensatory,—Pharmacopœia Parisiensis,—Brande's Experiments on the Angustura Bark,—Catalogus Rationalis Plantarum Medicinalium,—Annuaire Pharmaceutique, 1865,—Pharmaceutical Repertory, vol. i.,—British Annals of Medicine, vols. i. and ii.,—Catalogue of the Contributions from India to the London Exhibition of 1862,—Friderici Hoffmanni Observationum Physico-Chymicarum Selectiorum Libri III.,—Hippocrates Chymicus and Clavis. By Otto Tachenius,—Beguinus' Chymicall Essayes,—Abernethy's Surgical Observations on Local Diseases,—Cheselden's Anatomy of the Human Body,—Cheyne's Essay of Health and Long Life,—Moore's Outline of the History of Pharmacy in Ireland,—Sundry Pamphlets by the Society of Apothecaries: from Mrs. Warington,—Specimens of New Calisaya Barks from Eastern Bolivia discovered by Señor Pedro Rada: presented by Mr. Howard.

The following papers were read:—

CARBOLIC ACID PLASTER.

BY WILLIAM MARTINDALE.

Professor Lister, of the Glasgow Infirmary, having been led by the experiments of M. Pasteur, proving the germ theory of fermentation and putrefaction, and the action that carbolic acid has of destroying the vitality of these germs, has on these founded what is called "the antiseptic system of treatment in surgery," a series of papers on which he has published in the 'British Medical Journal.' The principle on which he proceeds is, that after the operation, air shall, as much as possible, be excluded from the wound, and that the dressings applied shall yield a constant supply of carbolic acid in the state of vapour, so that any "germs of organisms" which might obtain access to the part would become inert, their vitality being destroyed. By this means no sloughing takes place, putrefaction is entirely arrested, and the formation of unhealthy *pus*, which in the ordinary treatment causes such a drain upon the patient, is avoided. It is, in fact, "healing by the first intent."

Among the dressings employed, one of the first he used was a carbolic acid putty, made by mixing boiled linseed oil and whiting, with the addition of one part of carbolic acid to four of the oil. But this he found a somewhat clumsy and inconvenient preparation. He next tried a carbolic acid plaster, made by mixing *emplastrum plumbi* with one-fourth of beeswax to give it sufficient consistence, and carbolic acid in the proportion of one-tenth of the whole. This is spread on calico, in a layer of about one-twentieth of an inch. It is, however, inconveniently soft, and cannot be kept spread in stock. He says, "I have since found that by increasing the proportion of litharge, the lead-soap may be made to any degree of firmness that may be desired, provided that water

be not used in the manufacture. When the litharge and olive-oil are in the proportions directed by the Pharmacopœia, a certain quantity of water must be added to promote the combination of the fatty acids with the oxide of lead, and even then the process is a very tedious one. But it is an interesting fact, chemically, that if the litharge is used in about four times the Pharmacopœial proportion, although no water be employed, the combination proceeds under a brisk heat with great rapidity. It is upon this fact the following method of manufacture is based :—

"Take of

Olive-oil 12 parts (by measure).
Litharge (finely ground), 12 parts (by weight).
Beeswax, 3 parts (by weight).
Crystallized carbolic acid, 2½ parts (by weight).

Heat half the olive-oil over a slow fire, then add the litharge gradually, stirring constantly till the mass becomes thick or a little stiff ; then add the other half of the oil, stirring as before, till it becomes again thick. Then add the wax gradually, till the liquid again thickens. Remove from the fire, and add the acid, stirring briskly till thoroughly mixed. Cover up close and set aside, to allow all the residual litharge to settle ; then pour off the fluid, and spread upon calico to the proper thickness. The plaster made in this way can be spread by machine, and kept rolled in stock ; and, if in a well-fitting tin canister, will retain its virtues for any length of time."

But for almost all purposes the antiseptic lead plaster is superseded by his lac plaster, which is made in this manner :—

"Take of

Shellac, 3 parts.
Crystallized carbolic acid, 1 part.

Heat the lac with about one-third of the carbolic acid over a slow fire till the lac is completely melted ; then remove from the fire and add the remainder of the acid, and stir briskly till the ingredients are thoroughly mixed. Strain through muslin, and pour into the machine for spreading plaster ; and, when the liquid has thickened by cooling to a degree ascertained by experience, spread to the thickness of about one-fiftieth of an inch. Afterwards, brush over the surface of the plaster lightly with a solution of gutta percha in about 30 parts of bisulphide of carbon. When the sulphide has all evaporated, the plaster may be piled in suitable lengths in a tin box, without adhering, or rolled up and kept in a canister." The coating of gutta percha, through which the acid permeates freely, is given to prevent it adhering to the skin, as "it is desirable that such a dressing should adhere very slightly, if at all. It has this great advantage over the antiseptic lead plaster, that it cannot be softened either by a watery or an oily fluid." If made to contain much less than 25 per cent. of the acid, it is brittle, but this may be avoided by the addition of spirit of wine in an equivalent quantity, as this sample contains 12½ per cent. of acid and the same of spirit.

These plasters are generally kept applied to the part by means of ordinary adhesive plaster strapped round the edges of the piece employed. But to avoid any chance of germs getting access to the wound, to the adhesive plaster before spreading, he directs 1 per cent. of carbolic acid to be added.

Many other applications are used in this system of treatment, but these plasters being interesting pharmaceutical preparations, I have thought worthy of bringing under your notice this evening.

The samples exhibited were prepared in the Hospital Dispensary.

University College Hospital, Dec. 2, 1868.

In reply to an inquiry, Mr. MARTINDALE said there was but little loss of the carbolic acid by vaporization in making the plaster. The plaster might be kept for months without losing its pliable condition, or suffering any material deterioration in strength or quality.

LIQUOR OPII SEDATIVUS.

BY T. B. GROVES, F.C.S.

The valuable paper of Messrs. Deane and Brady, "Microscopic Research in relation to Pharmacy," read at the Pharmaceutical Conference Meeting at Bath, probably set many experimenting in the same direction; amongst them, myself.

On returning from Bath, I tried my hand on Liq. Opii Sed., but the results were not, I thought, worthy of publication. An additional fact or two having recently come under notice, I now offer a short *résumé* of experiments made during the years 1864–65.

Two fluid ounces of laudanum, mixed with four ounces of water, were evaporated to an ounce and a half, and set aside for a day.

During the evaporation, and subsequently, it deposited a considerable amount of quasi-resinous matter.

The filtered liquid, additioned with sp. vin. rect. ℥ss, formed Liq. Opii Sed. No. 1.

The resinoid precipitate, dissolved in sp. vin. rect. and acidulated with hydrochloric acid, was mixed with water, then heated to expel sp. vin. rect., and, when cold, filtered. The filtrate, containing all the principles soluble in acidulated water, reacted as follows:—Perchloride of iron caused an intense red coloration, indicative of meconic acid; ammonia, a permanent precipitate completely soluble in ether.

The ethereal solution, spontaneously evaporated, left a pale amorphous residue, that after treatment with sp. vin. rect., etc., gave an abundant crop of tufty and stellar crystals, with some polarizers of oblong figure. It seems clear, therefore, that proof spirit dissolves more meconic acid, narcotine, and narceine than does a similar bulk of pure water.

Liquor No. 1, evaporated on a glass slip side by side with Battley's, gave a microscopic figure very different from, and far inferior to it.

Both liquors had an acid reaction with litmus paper. Two drachms of each of them and of laudanum were separately evaporated to dryness, and the residues calcined under the same circumstances.

1. Battley's liquor gave	·4 gr.
2. No. 1	A trace.
3. Laudanum	·05 gr.

The ash of Battley's liquor consisted of sulphate and carbonate of lime, and its washing water was neutral in reaction. The ash of the laudanum consisted of deliquescent carbonate of potash and a lime salt.

Liquor No. 2 was made by boiling gently for half an hour two drachms of crude opium in two ounces of water, neutralizing the acidity of the decoction with milk of lime at the end of that time. The fluid, thrown on a filter, was washed up to fifteen drachms; then five drachms of sp. vin. rect., and four drops of dilute sulphuric acid were added. The use of lime and sulphuric acid was indicated by the composition of the ash of Battley's preparation.

The liquor gave a good yield of microscopic crystals, but less numerous than was expected. Narcotine was not present. It was found also that the whole of

the meconic acid had been removed. Two drachms evaporated, and the residue calcined, gave ·5 grain of ash, consisting of sulphate and carbonate of lime and chloride of calcium. The concentration of the liquor by evaporation rendered the crystallization indistinct; heat, therefore, long applied has an injurious tendency. This experiment was varied in several ways, without getting a better result.

Liquor No. 5 was prepared by boiling for a quarter of an hour three drachms of crude opium in two ounces of water. The fluid, thrown on a filter, was washed up to two ounces. The filter was then pressed, and the liquids mixed. The mixed liquids, digested with carbonate of lime to remove free meconic acid, and filtered, were reduced by cautious evaporation to eleven drachms, and four drachms sp. vin. rect. added. This addition caused a precipitation that was apparently of a double character, but on examination only meconate of lime could be identified. The chalk, etc., on the filter was washed with water and dissolved in dilute hydrochloric acid. The solution was bitter to taste, contained but a trace of meconic, and no sulphuric, acid. Ammonia in excess and ether removed from it a considerable amount of narcotin, which was obtained finely and distinctly crystallized. Subsequent agitation with acetic ether proved the absence of morphia.

The finished liquor gave evidence of the presence of meconic acid, and of another precipitant (? thebolactic acid) of peroxide of iron. Two drachms, evaporated to dryness and the residue calcined, gave ·4 grain of ash, consisting mainly of sulphate of lime, with just sufficient reduced sulphide to give it alkalinity. Spontaneously evaporated side by side with Battley's, it gave an inferior crystallization, nor was its flavour comparable with that of the "original." However, it contained no narcotine.

This experiment was varied several times, sometimes with a better, sometimes with a worse result.

Finally, the whole of the samples were mixed and set aside, and for some months forgotten. It was then observed that the bottle containing it had assumed the appearance characteristic of Liq. Opii Sed., and that the odour and taste of the liquid had sensibly improved. It was therefore tried again as to its crystallographic character, and it was found that the resinous precipitation on the bottle had freed the crystalline bodies from an impediment that had hitherto obstructed their assuming definite forms; the microscopic crystallization was, in fact, as good as could be desired, but, the liquor, having been reduced to the strength of laudanum before being put away, the crystals were only about half as numerous as in the case of the genuine Battley.

The formula I recommend for a Liquor Opii of the same strength as Tinct. Opii, B.P., is as follows:—

Take of Powdered Opium	1½ oz.
Prepared Chalk	¼ oz.
Rectified Spirit	5 fl. oz.
Distilled Water	q. s.

Boil gently for half an hour the opium and chalk with one pint of distilled water; filter; wash up to fifteen ounces, and add the spirit. After a few days' repose, filter again. It improves much by being kept. Of course, the finer the opium, the better the liquor.

Should the narcotine be thought worth recovering, the opium may be boiled with water alone, and the chalk subsequently added. The narcotine may be easily extracted from the dried chalk by boiling it with rectified spirit.

The physiological action of this preparation has been compared with that of opium. It has been found to produce the narcotic effects of that drug, without entailing the unpleasant after-effects so often complained of. I must explain that my Liq. Opii is not designed as a substitute for Battley's preparation, which

I invariably use when Liq. Opii Sed. is ordered. It may be regarded as a suggested improvement of Ext. Opii Liq., B.P.

The CHAIRMAN, in inviting discussion on this paper, remarked, that the preparation of a Liquor Opii that should be uniform in strength and composition, involved considerable difficulty, and they could not draw a just conclusion as to the value of the product obtained by the process given, without taking into account the great variation that occurred in different samples of opium. The quality of the opium, he thought, should be made the basis of any good process, for while differences occurred in the amount of morphia contained in different samples of opium to the extent of 200 per cent., there could be no uniformity where this was overlooked. Some samples of opium did not yield more than half an ounce of morphia from a pound, while other samples yielded two ounces. The use of carbonate of lime, as proposed, would, no doubt, tend to produce shortly what might otherwise be effected by evaporation, but he did not think that any such method was pursued in making the original Battley's solution, which he had reason to believe was simply an aqueous extract of good opium, the meconic acid of which was, to a great extent, destroyed in the process of evaporation. The free meconic acid and much of the extractive matter were thus got rid of, the latter being rendered insoluble. The great difficulty of all, however, was to get a normal opium that could be relied upon. The question had been asked, "What is opium?"—and this question was not so easily answered. He had had something to do with it during his lifetime, and sometimes he had thought that he knew something about it, but he believed there was still a great deal that remained to be made out, and even then there would be the difficulty that it was never twice alike. He had recently had some opium under his notice which had been made in Australia. He knew it to be perfectly genuine; it was of great beauty, as far as its external characters were concerned; it had the perfect odour of good opium, and it dissolved with the Persian character; but, singular to say, it contained very little morphia, but a great abundance of the other principles known to exist in opium.

Mr. WOOD said that a few months ago he was making experiments, with a view to ascertain the best method of producing liquor opii, and he was led to follow a suggestion thrown out by Dr. Redwood, in a lecture delivered before the Society some time ago, on Dialysis. In that lecture, Dr. Redwood suggested it might be possible to introduce a class of preparations called Diffusates, prepared from the crude drugs by the process of diffusion; and in the lecture, he (Dr. Redwood) exhibited a solution of opium which was called diffusate of opium. When he (Mr. Wood) was making the experiments to which he referred, he resorted to this process of diffusion as a likely one to yield a good liquor opii; and although, from want of time, he was not able to follow out these experiments with sufficient detail and accuracy, yet he succeeded generally in obtaining a liquor opii by a simple method of diffusion, which gave microscopically, so far as he could judge, a better crystallization than any other method that he tried. He tried the method which the Chairman had referred to, of repeatedly evaporating solution of opium, redissolving the extract, and again evaporating, and so on, until the resinous and extractive matter had been in a great measure separated, and that gave also a good crystallization. But it appeared to him that diffusion was in some respects the preferable method; certainly it subjected the opium to less heat, and that might be advantageous. He simply prepared a large ordinary floating dialyser standing in a pan of water, and put ordinary solution of opium into that, and left it for some days to diffuse. He changed the water twice or three times, and evaporated the whole diffusate, and thus obtained a kind of treacle, in which he determined the quantity of morphia by analysis; and then he diluted that up to such a strength that the liquor contained four grains of morphia to a fluid ounce.

Dr. ATTFIELD did not know whether they were quite agreed in what they wanted to obtain in liquor opii sedativus. If it were to be only the crystalline principles, then clearly the process which Mr. Wood had described would be the one they should adopt. If morphia was the only substance they were to keep their eye upon, and that would seem to be the case from the opinion of many therapeutists, as echoed by their Chairman that evening, then the logical conclusion to come to was, that the sooner they did away with liquor opii sedativus the better. He would like to do Mr. Groves the justice to revert to one sentence that he had written in his paper, in connection with what their Chairman had said regarding the value of liquor opii as depending upon the amount of morphia it contained. Mr. Groves did say that, "as a matter of course, the finer the opium, the better the liquor." Mr. Groves was not a man who was at all likely to lose sight of a point of that kind.

Mr. HASELDEN said that in making liquor opii there was no doubt that they must begin with the crude opium, and then they must manipulate so as to get out of the opium what they wished to have in the solution. If they pounded and macerated the opium, the probability was they would not get out of it all they required. The opium should be well worked up with the hand into a paste, and this done three or four times before they evaporated the solution, and then worked up again a fifth time before they would get what they required. To make good liquor opii the solution should be brought down to the consistency of a tolerably thick fluid. It should then be thrown into water, and redissolved and evaporated again; and that should be done three or four times before they would really get such an extract as they ought to have for making liquor opii. There was a curious thing in regard to this extract; he had noticed it in making aqueous extract of aloes. Each time they evaporated a clear solution, the extract, on being redissolved, left an insoluble residue. He thought, therefore, that in order to make good extract, it should be evaporated several times before it was employed for solution to make liquor opii sedativus. As regarded the quality of the opium, he suspected a good deal depended upon the nature of the soil as well as the clime from which it was imported.

Dr. REDWOOD would like to say a word or two with reference to what Mr. Wood had said about the application of dialysis to extracting the active principles from opium. As Mr. Wood had already stated, he (Dr. Redwood) did some years back make a great number of experiments with the view of ascertaining how far dialysis might be found applicable for obtaining a class of preparations which he proposed introducing in medicine, but he confessed that, with the single exception of the case of opium, from which alone he got any tolerably good results, his experiments did not prove favourable. Aqueous solution in a very diluted state must be used, and he had always found that, with most substances operated upon, before time enough could be given for the diffusion to take place to the required extent, decomposition set up in the solution. Where they used aqueous solution of vegetable substances, this generally occurred. One case in which he expected to get a satisfactory result was in the separation of the alkaloids from Cinchona bark, and there he entirely failed. He did not get any of the alkaloids to diffuse to an extent that would enable him to detect them by the ordinary tests; and, therefore, this method did not appear to be applicable to some of those cases where they would most desire to apply it, and altogether it involved difficulty. He should be sorry if, in stating this, he should at all discourage others from making further experiments in this direction. He had several times felt that probably he gave up the investigation rather too readily, and he had from time to time mentioned it to other persons with the view of inducing them to renew it. He confessed that beyond the single case of operating with opium, in which he did get, as Mr. Wood had

done, a tolerably satisfactory result, he got very imperfect and unsatisfactory results.

Mr. ABRAHAM thought the observation made by the President with respect to the necessity of carefully studying the quality of the opium employed, applied equally to the tincture of opium and to the fluid extract of opium of the Pharmacopœia; and the remarks he had made showed that those preparations must vary very materially in strength, particularly if they compared the preparation of one person with that of another. But he thought the remark made by Dr. Attfield was to the point, that they really did not know exactly what they wanted. A certain solution, called Battley's sedative solution, had acquired great reputation as possessing certain medicinal properties. Now, he wanted to make, not a substance which should contain either the alkaloids or any other particular extracted matter, but he wanted to produce a liquid which would produce the same sedative effects as Battley's solution, without producing the objectionable effects which were commonly ascribed to tincture of opium. The fluid extract of opium of the Pharmacopœia very much resembled the solution of opium of Battley and Watts; and, he did not know, but he presumed it was intended to be substituted for it.

ON METALLIC BISMUTH.

BY C. H. WOOD, F.C.S.

The issue of the discussion which has taken place in the Pharmaceutical Journal, on the Liquor Bismuthi et Ammoniæ Citratis of the British Pharmacopœia, is dependent on the nature and amount of the impurities present in commercial bismuth, and the efficiency of the nitre process for their removal. Although several communications from different contributors have been published upon this subject, no one has yet given any exact estimate of the quantity of impurity which the metal usually contains, and the proportion of this which can or cannot be removed by the Pharmacopœia method.

The officinal process for the purification of bismuth is in accordance with the method indicated by most chemical authorities. Gmelin, Watts, and other authors state that the impurities of bismuth are removed by fusion with nitre. Mr. Schacht's experiments sufficiently demonstrate the possibility of removing the whole of the arsenic by this means. It is true that, in some fusions, Mr. Schacht found a portion of the arsenic still remained in the metal, but we are not informed what the proportions were before and after, and we have every right to assume that, by continuing or repeating the process, the whole might have been removed in these as in the other cases. My own experiments have sufficiently satisfied me that the Pharmacopœia method is an efficient one for the complete removal of arsenic, antimony, and sulphur. The most careful application of Marsh's test has failed to detect either of the former substances in any sample of the metal I have purified.

Mr. Schacht and others, however, have brought forward experiments to show that the nitre process fails to remove the copper from bismuth, and have urged this point as one of the strongest objections to the Pharmacopœia method. It is certainly true that fusion with nitre is useless for the removal of very small quantities of copper. Down to what proportion it is possible to reduce the copper by this means, I am not prepared to say, and I do not know that any experiments have been published on the point. I cannot admit, however, that the nitre fails to remove any portion of this impurity, as some have implied; for the following experiment goes to show the contrary. Messrs. Johnson and Matthey were kind enough to prepare for me a piece of bismuth con-

taining 2·9 per cent. of copper. I fused this for ten minutes with one-fifth its weight of nitre, and then analysed the product. I found it to contain only 1·51 per cent. Consequently, nearly one-half the copper had in this case been removed. Nevertheless, I cannot deny that fusion with nitre fails to remove the last portions of copper, and is therefore useless as far as small percentages of this impurity are concerned.

Admitting this, it becomes important to know the exact amount of copper commonly present in the metallic bismuth of commerce. To ascertain this point, consequently, I have taken three commercial samples of metal, and have made quantitative determinations of the amount of copper in each. The analysis was performed as follows:—One hundred grains of the metal were dissolved in dilute nitric acid, and the solution evaporated until a pellicle formed. About an ounce of a saturated solution of sal ammoniac was then added, the mixture slightly warmed, and diluted to the bulk of thirty or forty ounces with cold water. All the bismuth was thus completely precipitated as insoluble oxychloride, leaving the copper, etc., in solution. After some hours' repose, the liquor was filtered, and the precipitate washed. The filtrate was evaporated to about two ounces, and a slight excess of ammonia added. After filtration, the liquor was acidified and precipitated by sulphuretted hydrogen. The sulphide was collected, washed with dilute sulphide of sodium, and dissolved in aqua regia. The solution was evaporated to dryness. The copper in the residue was then estimated, by precipitation with zinc in a platinum dish and weighing as metal, after the manner recommended by Fresenius.

The results obtained were as follows:—

Sample	No. 1	0·12 per cent.
,,	No. 2	0·07 ,,
,,	No. 3	0·05 ,,

Liquor Bismuthi prepared from the worst of these would contain about 0·0048 grain of copper in one fluid drachm; that is to say, less than the $\frac{5}{1000}$th part of a grain in a dose. Mr. W. L. Howie,* in a paper read before the Glasgow Chemists and Druggists' Association, in October, 1866, stated that he found the quantity of copper present in different samples of bismuth to vary from 0·04 to 0·1 per cent. My results are in close accord with this statement.

The fact that the nitre fusion fails to remove the copper constantly present in commercial bismuth has been the chief argument employed against the Pharmacopœia process for Liq. Bismuthi. When it is seen that the amount of copper in the metal need never exceed one part in a thousand, and will generally be much less, this objection, I think, loses much of its importance. The total impurities present in the doubly refined bismuth prepared and supplied for pharmaceutical and chemical purposes by Messrs. Johnson and Matthey are stated by the refiners never to exceed 0·5 per cent., and frequently to amount to not more than 0·3 per cent. I venture to think that such metal would bear comparison, in point of purity, with a very large number of chemical products now used in medicine.

But although, at the present day, all commercial bismuth contains an appreciable percentage of impurities, that is so only because there is no demand for a purer metal. In 1865, three years ago, Messrs. Johnson and Matthey exhibited in Dublin a large quantity of *chemically pure* bismuth. This metal was also shown at the Paris Exhibition last year. It can be produced in any quantity when required, and its price at the present time is 40*s.* per lb., the present cost of the commercial metal of good quality being 19*s.*, and that of the doubly-refined metal already referred to 22*s.* 6*d.* A sample of this bismuth was kindly lent to me by Messrs. Johnson and Matthey, and placed upon the table at the

* Pharm. Journ. Vol. VIII. p. 407.

last Pharmaceutical Meeting. No doubt the comparatively high price of this pure metal has hitherto prevented its use in pharmacy.

Mr. WATSON said he had found the same difficulty in the metallic bismuth of commerce that Mr. Wood had; namely, that of getting rid of all traces of copper. There were many different qualities of commercial bismuth in the market, but he had generally found that if they could only procure Saxony bismuth, it contained as little as 0·001 of copper and no arsenic; whereas the qualities generally met with contained 0·004 or 0·5 per cent. The bismuth that had been imported from Australia lately contained a much larger proportion of copper, and also traces of arsenic. He had frequently tried bismuth by fusion with nitre, but could not get rid of the last traces of copper.

Dr. ATTFIELD thought too much had been made of the presence of a trace of copper in bismuth, and too little of other impurities which were colourless. He should like to ask Mr. Wood whether his one part of copper in one thousand of bismuth gave much of a blue colour to the liquor, say, when they were looking at a Winchester quart; and he should like to ask Mr. Watson what sort of a result, so far as the eye was concerned, he got with bismuth containing 1-10,000th part of copper? Chemists and druggists generally, he feared, depended too much on the eye and too little on the test-tube.

The PRESIDENT remarked that there was another point of view in which he suspected they looked at it, and that was the cost. If it became a question simply of purity, there was not the slightest difficulty; but it was a question of cost. There had been imported into this country large quantities of bismuth from Australia and Peru, and many of these specimens of metal were certainly very impure; but there is one process which had been found to succeed, and that was at once to crystallize out the nitrate of bismuth, and by operating upon that they would get a bismuth which would be tolerably pure, the impurities remaining in the mother liquor almost entirely. That, however, was a long process, and they could do it with the other process quite well enough for medicinal purposes.

Dr. REDWOOD mentioned that there was not so much bismuth produced in Saxony now as formerly, the mines not being so fully worked as they used to be.

Mr. WATSON, in reply to Dr. Attfield's question as regarded the colour inseparable from the solution made by the best Saxon bismuth, said he had found they could trace it clearly by the eye by adding a few drops of ammonia. He remembered some few months ago sending out some bismuth to a provincial chemist, containing, he believed, not more than 0·05 of copper, and it was returned to them.

Mr. WOOD remarked, with reference to Dr. Attfield's inquiry, that the colour was due somewhat to the method of making the liquor. If the liquor were made with an appreciable excess of ammonia, and put into a wide bottle of some size, there would be a perceptible tint of colour. But it was not necessary to have that excess of ammonia; it was possible to re-neutralize that ammonia by acetic acid; and if they did that there would be no perceptible colour, or, at any rate, so far as his experience went, none which would at all interfere with the use of the product in pharmacy. No doubt the whole thing was a matter of cost and of hypercriticism, because he apprehended that if there were a slight trace of colour in the product, as a medicine it would not in the slightest degree interfere. But with regard to the cost he might state that, even in using the chemically pure bismuth which he had referred to, and which Johnson and Matthey sold at 40*s*., it was possible to make a liquor at 3*s*. a pound, which, he believed, was the price the original solution was sold at, although that was only one-third the strength of the solution made according to the

Pharmacopœia; so that, if chemically pure bismuth was required, its cost ought not to stand in the way.

THYMIC AS A SUBSTITUTE FOR PHENIC ACID.

BY M. BOUILHON, PHARMACIEN.

Creasote and phenic acid, although known and employed for some time with considerable success, have never really been favoured by the profession. This can only be attributed to their persistent odour, which most persons find disagreeable and repulsive. It is, in fact, almost impossible to dress a wound with phenic acid in a hospital without inconveniencing all the other patients; its application at home disgusts all those who are under the same roof. The operator himself, should he happen to get ever so little on his hands, which is almost invariably the case, is literally smoked, and notwithstanding all the washings and soapings imaginable, is condemned to carry during the rest of the day the disagreeable smell to the bedside of his other patients. These inconveniences, of a secondary nature, it is true, as far as regards the relief of the sick, have, however, their weight, and explain, to a certain extent, the very limited employment of phenic acid, consequently it has remained almost exclusively a commercial article.

As to creasote, it is only employed as an odontalgic by those who have tried all other remedies, and whose patience and repugnance have at length been overcome, unfortunately nearly always too late to receive any benefit from its application. Persons, completely ignorant of chemistry, have often asked this naive question,—Why do not chemists make inodorous creasote, or, at any rate, some which does not smell so bad? It is useless to try and make them understand that the properties of a body cannot be modified without changing its composition; the chemist must find it, unless he wish to pass for an ignoramus.

These considerations led me to try whether, among the many compounds of organic chemistry, one could be found resembling, as nearly as possible, the wished-for type. Thanks to the multifarious researches in this branch of the science, the series of phenols has been enriched with several homologous compounds; some have been discovered in the products of the distillation of pit-coal, their smell, however, like that of phenic acid, prevented their employment. One only, obtained from oil of thyme, was worthy of attention.

This body, rightly considered by Gerhardt as being a homologue of phenic acid, agrees with the general formula of the phenols, which is represented by

$$C_n + H_{n-6}, O_2.$$

Phenol, or phenic acid, has the formula—

$$C_{12} + H_6O_2$$

Cresylic acid—

$$C_{14} + H_8O_2$$

and the new homologue obtained from oil of thyme—

$$C_{20} + H_{14}O_2.$$

This compound known as thymol, and which I shall call thymic acid, for the same reason as phenol is called phenic acid, may be obtained in a crystallized state, in which it melts at 44° Centigrade, and boils at 230°, at a barometric pressure of 76 centimetres. Once melted, it often presents the peculiar property of remaining for an indefinite time in the liquid state.

Its odour is weak, agreeable, and resembles that of thyme. It is little soluble in water, very soluble in alcohol, especially if concentrated. It dissolves also

in ether and fatty bodies, and possesses no rotatory power when viewed with the polarizer. It combines easily with alkalies such as potash and soda, and forms soluble salts. Thymic acid possesses the important property of combining with skins and animal tissues, and rendering them completely imputrescible. When concentrated, it has an acrid and caustic taste; but in a very weak solution one can only discover a flavour of thyme, and a sensation of cold similar to that produced by essence of peppermint. Thymic acid is extracted from oil of thyme, in which it exists in combination with a carbide of hydrogen called thymene, isomeric with oil of turpentine, $C_{20}H_{16}$. In treating oil of thyme with an aqueous solution of potash or soda, the thymic acid is dissolved, and forms a soluble thymate, the thymine is thus separated, as it does not combine with alkalies. In decomposing the thymate by an acid, the thymic acid is liberated; it is then purified by washing, drying, and finally by distillation. Thymic acid can be obtained by submitting oil of thyme to extreme cold, in which case it crystallizes. That which is extracted by potash, even if submitted to ever so low a temperature, does not solidify, even if crystals of the modification obtained by freezing be thrown into it, so as to induce a formation of crystals. Therefore, thymic acid exists in two isomeric states. The product obtained from oil of caraway presents an analogous phenomenon. By the use of sulphydrate of ammonia, carvol is obtained, whilst the potash process furnishes an isomeric compound, carvacrol, which is distinguished from carvol by certain reactions.

This similarity of properties between thymic and phenic acids, as well as the agreeable smell of the former, induced me to employ it in medicine, and satisfactory results made me persevere in my researches.

Dr. Paquet willingly experimented on this new product, and last December a communication, presented to the Anatomical Society of Paris, confirmed the idea of its antiseptic properties. Since then, many have studied its properties, and it is to be hoped that ere long thymic acid will altogether replace phenic acid and creasote in medicine.

Dr. Attfield did not know in what relation the author of the paper might stand to the Pharmaceutical Society, but it must be very pleasant to know that a Continental pharmacist sent them a paper. It showed that an interest was excited on the Continent in favour of British pharmacy and the labours of the Pharmaceutical Society. There were some points adverted to by the author, of which he (Dr. Attfield) should like to notice three. The first was as to the commerce of carbolic acid. He did not think that the author could know the extent to which carbolic acid was used in this country, or he would have hesitated before saying that the article had not generally been accepted. Secondly, the author, in his opinion, seemed to lay too great stress on the value of chemical homology as indicative of the properties of bodies. He very properly noticed that thymic acid was a homologue of phenic acid, otherwise called carbolic acid; but it was separated to a pretty wide extent—as wide as that which separated acetic acid from valerianic acid; and no one would think of substituting one of these for the other. Then there was another matter of importance in a commercial point of view, which had not been touched upon by the author. He suggested this homologue of carbolic acid as a substitute for carbolic acid. They could obtain carbolic acid in large quantities, but where were they to obtain large quantities of thymic acid? So far as he knew, the garden thyme—*Thymus vulgaris*—gave something like sixty drops of oil per pound of substance, and the common thyme—*Thymus Serpyllum*—gave about the same quantity. Then there was thymic acid in horse-mint, he did not know to what extent, but he presumed it would not give them much more than the garden or common thyme. And, lastly, they had the same substance occurring in the essential oil of *Ptychotis Ajowan*, of which Dr. Stenhouse

gave them an elaborate analysis some eight or ten years ago. But all these put together yielded next to no quantity of the substance which the author proposed as a substitute for carbolic acid.

Dr. Redwood did not think it would be quite fair to discourage the inquiry that appeared to have been made by the author of the paper, and the suggestion he threw out for attempting to find some substitute for carbolic acid, especially on the grounds which had been urged. In reference to the author's having, in seeking a substitute for carbolic acid, sought among the homologues of carbolic acid,—surely there was nothing unreasonable in that! If Dr. Attfield had been seeking a substitute for acetic acid, he would most likely have looked among the class of acids which were homologous, and not amongst the class of alkaloids or salts. He would have looked amongst bodies analogous in constitution. But the author of the paper was not influenced in adopting thymic acid as a remedy by the mere fact that it was a homologue of the body for which he required a substitute. He took this, and very fairly submitting it to experiment, ascertained what its physiological properties were, and, finding those to coincide with carbolic acid, surely he could not have pursued a more correct method of investigation, or one more likely to bring him to a satisfactory result! And if they took the statement as given by the author,—and they had nothing else to guide them,—they must admit that, so far as properties were concerned, he had found a substance which appeared to answer the purpose of carbolic acid. And then, with reference to the supply, it was suggested that there was no probability of there being any adequate supply of this thymic acid. But they must not judge too hastily. Even admitting that they would find a great difficulty in getting any quantity of oil of thyme in this country, as they found it difficult to get any quantity of true oil of rosemary, it did not follow that the same difficulty would be experienced elsewhere. If it could be shown that the oil of thyme, or the acid which might be separated from it, possessed some decided advantage over another substance which they were now using, and if a demand were once created for it, he was not at all sure that the means of supplying it would not be provided. On the Continent oil of thyme was produced much more abundantly than it was in this country; and he believed that if the demand were increased, the supply would take place to a much greater extent. But they were not limited to that, for, as Dr. Attfield had stated, the oil of ajowan yielded exactly the same product; and he did not know—perhaps Mr. Hanbury could tell them—to what extent that was now produced in the East Indies. They must not too readily condemn and discourage what a gentleman had attempted to do in proposing a substitute for a substance which did possess some decided objections in regard to its physical qualities as applied in medicine.

Mr. Hanbury said that when he first heard this paper read, he felt the same objections as those stated by Dr. Attfield. But he could only suppose that the writer of the paper meant to imply that thymic acid might be prepared and used in a few rare cases where the odour of carbolic acid might be an objection. Under these circumstances, he thought there would be no difficulty in obtaining a sufficient supply; because, although all the oil of thyme in the world were a mere nothing compared with the present demand for carbolic acid, yet there was a sufficient quantity of it for the small amount that might be used in medicine. Oil of thyme was produced to a considerable extent, comparatively, in certain districts of the South of France, where the barren hills were entirely covered with our common garden thyme, and the oil was sold in this country for 2*s.* or 3*s.* per pound. With regard to the ajowan, that was an exceedingly common product in India: the seeds were used by the natives, and no doubt the oil could be produced in considerable quantities and imported into this country, but at present there was no demand for it.

The PRESIDENT then called attention to some interesting specimens of Cinchona bark, kindly sent to them by Mr. Howard; to a specimen of poison-bottle; and to a register of poisons from Mr. Mackay, of Edinburgh, which, he considered, would be very useful.

The meeting then adjourned to the 6th of January.

THE PROPOSED BYE-LAWS

TO BE SUBMITTED FOR CONFIRMATION BY THE PHARMACEUTICAL SOCIETY ON THE 14TH OF JANUARY.

PRELIMINARY.

In the following Bye-laws words importing the singular number shall include the plural number; and words importing the plural number shall include the singular number, unless there be something either in the subject or context repugnant to such construction. By the expression, "the Statute, 1852," shall be meant and intended the Statute, 15 & 16 Vict., cap. 56, intituled "An Act for regulating the qualifications of Pharmaceutical Chemists;" and by the expression "the Act, 1868," shall be meant and intended the Statute, 31 & 32 Vict. cap. 121, entitled "An Act to regulate the Sale of Poisons, and alter and amend the Pharmacy Act, 1852." All the Bye-laws heretofore passed are hereby repealed.

SECTION I.

QUALIFICATIONS, ELECTIONS, AND SUBSCRIPTIONS.

Charter, lines, 69, 89; Stat. 1852, sec. x.

1. Persons who have respectively become Members, Associates, and Apprentices or Students of the Society, pursuant to the Charter of Incorporation, the Statute, 1852, and the Bye-laws which have heretofore from time to time been in force, may continue to be Members, Associates, and Apprentices or Students respectively, subject to the Bye-laws in force for the time being.

Charter, lines 69, 89; Stat. 1852, sec. x.; Act, 1868, sec. xviii-xx.

2. Persons qualified to be elected Members, Associates, or Apprentices or Students of the Society, shall at a meeting of the Council be proposed and seconded by Members of the Council. The qualification of the proposed Member, Associate, or Apprentice or Student, shall be stated in a written resolution, which, when proposed and seconded, shall be submitted to the Council, and when passed, shall confer the right of becoming a Member, Associate, or Apprentice or Student.

Stat. 1852, sec. x.

3. Persons registered as Pharmaceutical Chemists under section 10 of the Statute, 1852, and desirous of becoming Members of the Society, shall make application to the Council in that behalf.

4. Persons who, at the time of the passing of the Act, 1868, were or had been in business on their own account as Chemists and Druggists, who shall be registered as Chemists and Druggists, and be desirous of becoming Members of the Society, in exercise of the privileges conferred by Sections 18 and 19 of this Act, 1868, shall make application to the Council in that behalf. Act 1868, sec. xviii. and xix.

5. Associates of the Society, who became such before the 1st day of July, 1842, shall be elected Members on the production of certificates of qualification satisfactory to the Council. Charter, lines 72, 73.

6. No persons other than those who have previously been registered as Pharmaceutical Chemists or Associates of the Society, who became such before the 1st day of July, 1842, or those who, at the time of the passing of the Act, 1868, were or had been in business on their own account as Chemists and Druggists, and have previously been registered as Chemists and Druggists, shall be elected Members, unless as Honorary or Corresponding Members. Stat. 1862, sec. x.; Act 1868, sec. xix. xx.

7. Persons registered as Assistants, and desirous of becoming Associates of the Society, under Section 10 of the Statute, 1852, and persons registered as Chemists and Druggists, by reason of having obtained certificates of qualification from the Board of Examiners, and desirous of becoming Associates of the Society, under section 20 of the Act, 1868, shall make application to the Council in that behalf, and no other person shall be elected an Associate. Stat. 1852, sec. x.; Act, 1868, sec. xx.

8. Persons registered as Apprentices or Students under Section 10 of the Statute, 1852, shall be eligible for admission as Apprentices or Students of the Society, and, if desirous of being admitted accordingly, shall make application to the Council in that behalf. Charter, lines 80, 88.

9. All persons on election as Members, Associates, or Apprentices or Students, shall sign a written declaration, stating their full names and addresses, and their willingness to comply with the regulations of the Society.

10. All Subscriptions for the current year shall become due upon election, and all annual subscriptions shall become due on the 1st day of January in every year; and if any Member, Associate, or Apprentice or Student shall not have paid his annual subscription before the 1st day of May in any year, his name shall be omitted from the Register of Members, Associates, and Apprentices or Students of the Society, certified by the Council at the Annual Meeting. It shall be competent to the Council to restore any defaulter to his former status in the Society on payment of his arrears and any fine which it may be thought fit by the Council to impose, not exceeding half-a-guinea. Charter, line 245. Act, sec. v. Charter, line 75.

11. All persons who have become Life Members of the Society Charter, lines 74, 76.

pursuant to Bye-laws which have heretofore from time to time been in force, shall be exempt from further contributions to the funds of the Society.

12. All persons becoming Members of the Society, in exercise of the privileges conferred and defined by Sections 18 and 19 of the Act, 1868, shall on election pay an entrance-fee or sum of two guineas, exclusive of an annual subscription.

Charter, lines 74, 76, 45.

13. All Members of the Society, except Life Members or Honorary and Corresponding Members, shall pay an annual subscription of one guinea.

Charter, line 245.

14. All persons who, before the 1st day of October, 1862, paid fees on, and passed the Major Examination, and who, by reason of registration as Pharmaceutical Chemists under the Statute, 1852, qualified themselves to be elected Members of the Society, shall have the option of becoming Life Members exempt from further contribution on payment of a life subscription of five guineas.

Charter, line 245.

15. All Members of the Society, other than those mentioned in the last preceding Bye-law, shall, after having paid the entrance fee, if any payable, have the option of becoming Life Members exempt from further contribution on payment of a life subscription of twenty guineas.

16. All persons who, prior to the first day of October, 1862, became Associates, Apprentices or Students, and who may not for the time being be entitled to exercise and be exercising any privilege created by Sect. 20 of the Act, 1868, shall be exempt from annual subscriptions to the funds of the Society, as Associates, Apprentices or Students respectively.

17. All Associates, Apprentices, and Students, other than those exempted by the last-preceding Bye-law and other than Associates entitled to continue and continuing Associates, being in business on their own account, shall pay an annual subscription of half-a-guinea.

Charter, lines 87, 88, 245.

18. All the Associates who, under Section 20 of the Act, 1868, are entitled to continue, and are desirous of continuing as such Associates, being in business on their own account, shall give notice to the Secretary in that behalf, and shall, in accordance with the same section, contribute to the funds of the Society the same subscriptions as Members, and in default thereof shall cease to be Associates.

19. Persons who have exercised the privilege of continuing Associates whilst in business on their own account, shall, on ceasing to be in business on their own account, give notice thereof to the Registrar, and the Registrar shall thereupon, without fee, amend the Register of Associates, in accordance with such notice, and the Associates shall, whilst so ceasing to be in business, pay the annual subscription of half-a-guinea.

SECTION II.

HONORARY AND CORRESPONDING MEMBERS.

1. The Council shall at their discretion elect as Honorary and Corresponding Members of the Society such scientific men as have distinguished themselves in any of the branches of knowledge embraced in the educational objects of the Society. Charter, lines 204, 207.
2. The Council shall from time to time determine the number of persons to be Honorary and Corresponding Members, and there shall be a book kept by the Council, in which Members of the Council shall enter the names of persons whom they may consider eligible for election, and at the meeting of the Council in April of every year names shall be selected from the book so to be kept, not exceeding in number the vacancies in the list of Honorary and Corresponding Members, and the names of the persons so selected shall be exhibited in the Library until the meeting of the Council in the ensuing month, when the Council shall proceed to the election.

SECTION III.

COMMON SEAL.

1. The Common Seal of the Pharmaceutical Society of Great Britain shall consist of the armorial bearings, crest, and motto, registered in Her Majesty's College of Arms. Charter, line 30.
2. The said seal shall be deposited at the house of the Society, in a box having a lock and two keys, one of which shall be in the custody of the President, and the other in that of the Vice-President.
3. The Common Seal shall not be set or affixed to any deed, instrument, or writing whatsoever, unless in the presence of the Council of the Society, and in pursuance of an order or minute entered in their books.

SECTION IV.

BYE-LAWS.

The making, altering, or abrogating any Bye-law shall be in the following manner:—

1. A written formula for any proposed Bye-law, or for altering or abrogating any Bye-law, being delivered by a Member of the Council to the Chairman, shall thereupon be read, and, if seconded and approved, shall be referred to two subsequent ordinary or special meetings of the Council for confirmation, and then to a Special General Meeting of the Members of the Society, and afterwards to the Privy Charter, lines 226, 256, 263.

Council, according to the provisions of the Statute, 1852, as amended by the Act, 1868.

2. A copy of the Bye-laws shall be given to every Member and Associate of the Society on his election, and shall at any time be delivered to any Member, Associate, Apprentice or Student of the Society on his applying for the the same, and paying one shilling.

SECTION V.

ELECTION OF COUNCIL AND AUDITORS.

1. Two-thirds of the Members of Council shall go out of office in every year according to the provisions of the Charter; seven of them shall consist of those Members who remained in the Council after the lot was taken in the last preceding year, or their representatives; the other seven shall be taken by lot from the remaining fourteen Members.

Charter, lines 148, 163.

2. The retiring Members of the Council shall be ascertained and determined at the monthly meeting held in February of every year, and the names shall be advertised on or before the 10th day of March in every year.

3. Any person qualified to vote desirous of nominating any Member for election as a Member of the Council or as an Auditor, shall give notice in writing with the name and address of the nominee, and if for the Council disclosing whether such nominee be or not a Pharmaceutical Chemist, to the Secretary of the Society, on or before the 24th day of March in every year, and the Secretary shall on or before the 26th day of March then instant address and send by post to each nominee a notice of his having been so nominated, and inquiring whether he will accept office if elected, and in default of a written reply from such nominee, declaring his readiness to accept office if elected being received on or before the 31st day of March then instant, such nominee shall not be deemed eligible or willing to be elected.

Stat. 1852, sec. ; Act, 1868, sec. xix.

4. The Council shall at their monthly meeting, held in April of every year, prepare a list of all persons nominated for election and eligible and willing to be elected Members of the Council and Auditors for the ensuing year, and disclosing the qualifications of nominees for the Council; and in default of the nomination of a sufficient number of persons eligible and willing to accept office, the Council shall nominate as many as may be required to form a complete list of eligible and willing persons to fill all the vacancies in the Council, and a complete list of five Auditors. No nominations shall be received or made after the 24th day of March, except such as may be made by

Charter, line 153, and Act 1868, sec. xix.

the Council, in the matter and under the circumstances aforesaid, at the monthly meeting in April.

5. The Secretary shall issue to every person residing in Great Britain and qualified to vote, not less than ten days prior to the meeting at which members of the Council and Auditors, or either of them, are to be elected, a Voting Paper for such elections. The names and residences of the Members eligible and willing for election, and whether they are or not on the register of Pharmaceutical Chemists, shall appear in such Voting Papers, and in all Voting Papers for the election of Members of the Council, the names of the Members who remain in office, and whether they are or not on the Register of Pharmaceutical Chemists shall also appear. Stat. 1852, sec. iii.; Act 1868, sec. xix.

6. At all elections of Members of the Council and Auditors, votes may be given by ballot, either by personal delivery of the said Voting Papers at the time of election, or by the said Voting Papers being transmitted under cover to the Secretary, so that the same shall be received by him not less than one clear day prior to the day on which the election is to take place, and the Voting Papers shall be in the following form:— Charter, line 135; Stat. 1852, sec. iii.; Act 1868, sec. xxi.

Voting Paper to be delivered personally on the day of election, May , 18 , or transmitted under cover to the Secretary, so that it shall be received by him prior to the election. An envelope duly addressed accompanies this.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN,

17, Bloomsbury Square, W.C.

For the election of Fourteen Members of the Council.

NAMES OF MEMBERS ELIGIBLE AND WILLING FOR ELECTION.

1*	_____	11	_____
2	P.C. _____	12	_____
3	_____	13	_____
4*	P.C. _____	14	_____
5	_____	15	_____
6	_____	16	_____
7	_____	17	_____
8	_____	18	_____
9	_____	19	_____
10	_____	20	_____

The names to which Stars are prefixed, are those of Members of the present Council who are eligible for re-election.

The names to which the letters P.C. are prefixed, are those of Pharmaceutical Chemists.

The names to which the letters P.C. are not prefixed, are those of persons who are not on the Register of Pharmaceutical Chemists.

INSTRUCTIONS FOR VOTING.

Every person voting must erase the names of all the Candidates for whom he does not intend to vote. If more than fourteen names be left, the Voting Paper will be rejected. Section 19 of the Act, 1868, is printed below.

The Voting Paper, after the erasure of names, should be folded up, and must be transmitted under cover to the Secretary, so that the same shall be received by him prior to the election, or delivered by the voter personally at the time of election.

To prevent imposition, the person voting must sign his name and address on the line on the outside of the cover.

The following are the Members who remain on the Council:—

P.C._____

_____

P.C._____

P.C._____

_____

_____

P.C._____

The names to which the letters P.C. are prefixed, are those who are Pharmaceutical Chemists.

Section 19 of the Act, 1868, is as follows:—

19. Every person who is or has been in business on his own account as a Chemist and Druggist as aforesaid at the time of the passing of this Act, and who shall become a Member of the Pharmaceutical Society, shall be eligible for election to the Council of the Pharmaceutical Society, but the said Council shall not at any time contain more than seven Members who are not on the Register of Pharmaceutical Chemists.

—— is the utmost number of Members not Pharmaceutical Chemists who can be elected on the Council on the present occasion.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN,

17, Bloomsbury Square.

Voting Paper, May, 18 , *for the election of Five Auditors.*

CANDIDATES.

1_____

2_____

3_____

4_____

5_____

6_____

7_____

INSTRUCTIONS FOR VOTING.

Every person voting must erase the names of all the Candidates for whom he does not intend to vote. If more than five names be left, the Voting Paper will be rejected.

The Voting Paper, after the erasure of names, should be folded up, and must be transmitted to the Secretary, so that the same shall be received by him prior to the election, or delivered by the voter personally at the time of election.

To prevent imposition, the voter must sign his name and address on the outside of the cover.

Form of Address, etc., on Envelope.

VOTING PAPER.

Voter's Signature_____

Voter's Address_____

To the Secretary of the Pharmaceutical Society, 17, *Bloomsbury Square, London, W.C.*

The Voting Paper must be returned to the Secretary, so that the same may be received by him before the election, or be delivered personally at the time of election.

7. Before the votes are taken, the persons constituting the meeting shall appoint from amongst themselves four or more Scrutineers, of whom four shall form a quorum.
8. The Voting Papers to be delivered personally shall be received at the General Meeting, and the Voting Papers duly transmitted under cover to the Secretary, shall be opened by or in the presence of the Scrutineers.
9. The Scrutineers shall ascertain the number of votes given for each Member nominated for election, and in any case of an equality of votes, the Chairman of the Meeting shall have a second or casting vote. Charter, line 100.
10. It being provided by Section 19 of the Act, 1868, that the Council shall not at any time contain more than seven Members who are not on the Register of Pharmaceutical Chemists, the Scrutineers shall, after the voting on any election of Members of the Council, certify to the Chairman of the Meeting whether or not the number of Members not on the Register of Pharmaceutical Chemists nominated for election is more than seven, or more than may with any like Members remaining on the Council make up the number of seven; and if they shall certify that the number of Members not on the Register of Pharmaceutical Chemists nominated for election is more than seven, or more than may as aforesaid make up the number of seven, then they shall further likewise certify the number of votes given in favour of each of such Members so nominated, and which of such Members so nominated to the number of seven or the lesser number, sufficient to make up as aforesaid the number of seven, have a majority of votes over the remainder of such Members, and that such of the said Members as have not the said majority are in a minority of their class. Act 1868, sec. xix.

11. The Scrutineers shall make to the Chairman a return, signed by them, of the names of the Members nominated for election, but in the case of an election of Members of the Council, such return shall be exclusive of the names of such, if any, Members not being Pharmaceutical Chemists as may be certified to be in a minority of their class, and the said return shall disclose the number of votes given for each Member named therein.
12. The Chairman of the Meeting shall declare the result of every election; and, in cases where there shall have been a poll, shall declare the election to have fallen on the Members who, according to the return of the Scrutineers contemplated by the last-preceding Bye-law, shall appear to have a majority.
13. The Chairman at any Meeting for the election of Members of the Council or Auditors, shall have the power of adjourning such Meeting from time to time, with a view to the reception of the Report of the Scrutineers, but no such adjournment shall extend beyond a period of four days.

SECTION VI.

COUNCIL.

Charter, line 179.

1. The Council shall meet at the Society's house on the first Wednesday in every month at eleven o'clock in the forenoon. Seven Members shall constitute a quorum, and without that number being present no business shall be transacted; before other business is entered on, the minutes of the preceding monthly and of any subsequent meeting or meetings shall be read.

Charter, line 185.

2. All motions or proposals shall be written, together with the names of the mover and seconder, and upon being put shall be decided by a show of hands, except in cases of a ballot, which may be demanded by any Member. Should the numbers be equal, the Chairman shall have a second or casting vote. It shall be lawful for the Chairman to postpone or adjourn to the next meeting any motion whereof notice in writing has not been given at a prior meeting.

Charter, lines 97, 10.

3. All resolutions carried at the Meetings of the Council, except such as relate to the Bye-laws, shall be acted upon without confirmation.
4. The Council shall elect from among themselves a Committee for General Purposes, a Committee of Finance, a Committee for the Library, Museum, and Laboratory, and from time to time such other Committees as may be necessary. The President and Vice-President shall be *ex officio* Members of all Committees, and if present, one of them shall preside.

SECTION VII.

COMMITTEE FOR GENERAL PURPOSES.

1. This Committee shall consist of not less than twelve Members, four of whom shall constitute a quorum. The Committee shall meet as often as may be required, and its proceedings shall be reported to the Council.

SECTION VIII.

COMMITTEE OF FINANCE.

1. This Committee shall consist of not less than four Members, two of whom shall constitute a quorum. The Committee shall meet once or oftener in every month.
2. It shall be the duty of this Committee to regulate and examine the accounts, to check the receipt of all moneys, to examine all bills, and to present at the monthly meetings of the Council such as shall have been approved for payment, with the signature of a quorum attached. This Committee shall also prepare a balance sheet for the Auditors previous to the annual meeting.

SECTION IX.

THE COMMITTEE FOR THE LIBRARY, MUSEUM, AND LABORATORY.

1. This Committee shall consist of not less than four Members, two of whom shall constitute a quorum. The Committee shall meet once in every month, and report from time to time to the Council.
2. It shall be the duty of this Committee to superintend the arrangement and preservation of the books, specimens, and apparatus, to inspect the Laboratory, and to make regulations for the admission of visitors and students to the Library, Museum, and Laboratory.

SECTION X.

EXAMINERS—EXAMINATIONS—FEES.

1. The Board of Examiners heretofore appointed shall continue in office until the first monthly meeting of the Council after the general meeting in the year 1869.
2. The Council shall, at the first monthly meeting of the Council after the general meeting in 1869, and in every subsequent year, appoint such competent persons as they shall think fit, to be examiners to conduct all such examinations as are provided for or contemplated by

Charter, line 196; Act, sec. viii. ix.

the Charter or by the Statute, 1852, and the persons so appointed shall constitute and be called the Board of Examiners for England and Wales.

3. The Council shall, at the first monthly meeting of the Council after the general meeting in 1869, and in every subsequent year, appoint fit and proper persons in Scotland to be examiners, and to meet in Edinburgh or Glasgow, or such other place or places as the Council may think desirable, and to conduct there all such examinations as are provided for or contemplated by the Statute, 1852, and the persons so appointed shall constitute and be called the Board of Examiners for Scotland.
4. The President and Vice-President of the Society shall, *ex officio*, be members of the Boards of Examiners, and shall preside at all meetings of such Boards at which they shall be present.
5. The Council shall not after the first day of January, 1871, appoint any person who has attained the age of sixty-five years at the time of the appointment to be an Examiner, unless such person shall be the President or the Vice-President of the Society.
6. No person shall be appointed an Examiner who at the time of appointment is, or who during one year prior to the time of appointment has been, a Member of the Council, other than the President or Vice-President; and the election of any Examiner to be a Member of the Council shall vacate his appointment as an Examiner.
7. The Board of Examiners for England and Wales shall consist of not more than twelve nor less than eight Pharmaceutical Chemists, exclusive of the President and Vice-President of the Society. The Board of Examiners for Scotland shall consist of not more than eight nor less than four Pharmaceutical Chemists, exclusive of the President and Vice-President of the Society. The Council of the Society may from time to time appoint professors of science to assist either of the Boards of Examiners at any of their examinations. Eight members of the Board of Examiners for England and Wales, and four members of the Board of Examiners for Scotland, exclusive in each case of assistant professors, shall constitute a quorum.

Charter line 197.

8. The Council of the Society shall from time to time supply any vacancy in the office of examiner, and may remove any member of the Board of Examiners, and substitute another person in his place, and may also from time to time appoint a Special Examiner, or Special Examiners, to conduct any examination as to knowledge of the Latin language.

Act, sec. viii.

Act, sec. viii.; Charter, line 231.

9. As the Act, 1868, contains a provision that all such persons as have from time to time been appointed to conduct

examinations under the Pharmacy Act shall be and are thereby declared to be examiners for the purposes of that Act, provided that no person shall conduct any examination for the purposes of that Act until his appointment has been approved by the Privy Council, the Secretary shall from time to time submit to the Privy Council for approval all appointments of Examiners made by the Council of the Society, and shall also give notice to the Privy Council of all Examinations to be held for the purposes of that Act, stating the times and places at which such Examinations will be held, at least three days *prior* to the holding of the same. Act, 1868, sec. vi.

10. The Boards of Examiners respectively shall meet as often as may be required for the purpose of conducting examinations at such times as the Council of the Society from time to time shall direct; and such Boards respectively shall report the result of every examination to the Council of the Society at the Monthly Meeting immediately following the same. Charter, line 231.

11. The Boards of Examiners shall conduct all examinations according to the Bye-laws in force in that behalf, and according to such regulations as shall be made or adopted by them from time to time, and as shall have been approved by the Council of the Society. Such regulations shall from time to time be inserted in the published report of the Transactions of the Society. Charter, lines 226, 231.

12. All persons who shall tender themselves to the Examiners for examination, in accordance with the Charter and the Statute, 1852, shall be examined in their knowledge of the Latin language, in English Grammar, and Composition, and Arithmetic, which examination shall be called the first examination. Such of the said persons as shall desire Certificates of competent skill and qualification to be engaged or employed as Assistants shall be examined in the first examination, and also in the translation and dispensing of Prescriptions, in Botany, in Materia Medica, in Pharmaceutical and General Chemistry, the Chemistry of Poisons and Posology, which examination shall be called the Minor Examination; and such of the said persons as shall desire Certificates of competent skill and qualification to exercise the business or calling of Pharmaceutical Chemists shall be examined in the Minor Examination, and in more extended knowledge of Botany, Materia Medica, the translation and dispensing of Prescriptions, Pharmacy, General Chemistry, the Chemistry of Poisons and Posology, which examination shall be called the Major Examination. Stat. 1852, sec. viii.

13. All persons who shall tender themselves to the Examiners for examination, under the provisions of the Act, 1868, excepting only those specified in the next following Bye-law, shall be examined in the Minor Examination.

14. All persons entitled to be registered as Chemists and Druggists on passing a modified examination, who shall tender themselves to the Examiners for examination under the provisions of the Act, 1868, shall pass the Modified Examination, which the Council of the Pharmaceutical Society, with the consent of the Privy Council, have declared to be in their case sufficient evidence of skill and competency to conduct the business of a Chemist and Druggist, as the same is set out in the Schedule hereto, or such other modified examination as may in like manner be declared such sufficient evidence.

Act, 1868, cl. 4.

15. The Examiners shall grant or refuse to such persons as have tendered themselves for the Minor Examination and the Major Examination respectively, as in their discretion may seem fit, Certificates of competent skill and knowledge and qualification, and such Certificates or duplicates thereof or cards of like purport shall be delivered by the Examiners to the Registrar.

16. All persons before registration as Apprentices or Students shall pass the first examination, and shall pay a fee of Two Guineas, whereupon they shall be registered as Apprentices or Students.

17. All persons desiring registration as Assistants under the Statute, 1852, or as Chemists and Druggists under the Act, 1868, excepting those named in the next following Bye-law, shall pass the Minor Examination, and shall pay fees of Three Guineas if previously registered as Apprentices or Students, or otherwise fees of Five Guineas, whereupon they shall be registered accordingly.

18. All persons entitled to be registered as Chemists and Druggists, on passing a modified examination, and desiring so to be registered, shall pass the Modified Examination, and shall pay a fee of One Guinea, whereupon they shall be registered accordingly.

19. All persons desiring registration as Pharmaceutical Chemists under the Statute, 1852, shall pass the Major Examination, and shall pay a fee of Five Guineas if previously registered as Assistants, or otherwise a fee of Ten Guineas, whereupon they shall be registered accordingly.

SECTION XI.

REGISTRAR AND REGISTRATIONS.

Stat. 1852, sec. iv.

1. The Registrar shall receive and preserve certificates, cards, or tickets issued by the Examiners, signifying that examinations have been passed.

Stat. 1852, secs. v. x.

2. The Registrar shall from time to time make out and maintain a Register of all persons being respectively Members, Associates, and Apprentices or Students of

the Society, also a Register of all persons entitled to be registered under the Statute, 1852, and also a Register in accordance with the provisions of the Act, 1868, of all persons who shall be entitled to be registered under that Act, with proper indices of such Registers respectively. Act, 1868, sec. x.

3. The names of persons registered as Apprentices or Students of the Society, shall, upon their Registration as Pharmaceutical Chemists, Associates, Assistants, or Chemists and Druggists, be removed from the Register of Apprentices or Students.
4. The names of persons registered as Associates or Assistants shall, upon their registration as Pharmaceutical Chemists, be removed from the Register of Associates, or the Register of Assistants, as the case may be.
5. Persons who have not been examined under the said Statute, 1852, who have been registered as Pharmaceutical Chemists by reason of their election as Members of the Society, and who have not paid life subscriptions, shall pay the annual subscription required from Members; and the names of all such Members as last mentioned who fail to pay their annual subscription before the first day of May in any year, shall be omitted from the Register of Pharmaceutical Chemists. Stat. 1852, sec. v. & vi.; Charter, lines 74, 98, 245.
6. The Registrar shall comply with such Orders or Regulations for regulating the Register to be kept under the Act, 1868, as may from time to time be made by the Council. Act 1862, sec. ix.
7. All the said Registers shall be revised annually and laid before the Annual General Meeting of the Society. Charter, line 98; Stat. 1852, sec. v.; Act 1868, sec. x.
8. The Registrar shall, in the month of January in every year, at the expense and for the profit (if any) of the Society, cause to be printed and published and sold a correct Register, as required by the Act 1868, and in so doing shall comply with such rules and regulations as may from time to time be in that behalf made by the Council. Act 1868, sec. xiii.

SECTION XII.

TREASURER.

1. It shall be the duty of the Treasurer to receive all moneys, to pay such accounts as the Council may order by the signature of six Members of the Council in Council assembled, and to render his account at each monthly meeting. Charter, lines 176, 229.

SECTION XIII.

SECRETARY.

1. The Secretary shall have authority over the servants of the establishment, whose wages he shall pay. He shall be in attendance at his office from 9.30 a.m. to 5 p.m. Charter, lines 177, 229.

every day, except Saturday, and be present at all meetings of the Council and Committees, General and Special Meetings, and also at the Evening Meetings and Lectures. It shall be his duty to superintend the affairs of the Society under the direction of the Council and Committees. He shall keep the books of the Society in a neat and orderly manner, shall conduct the correspondence, and issue all summonses, take the minutes of all Meetings for business, and read them, and make a report of all matters that come under his cognizance for the information of the Council and Committees. He shall consult the President or Vice-President on any business requiring attention, between the various meetings, and be responsible for the safe custody of all the documents and property belonging to the Society which shall be under his control; he shall find security in the sum of £500, and shall receive all subscriptions, fees, and donations, and give a printed receipt for the same, and no other, checking each receipt. He shall every Saturday transact any business of the Society that may be required out of doors, and pay to the Treasurer the amount of moneys received by him during the week. He shall receive such a sum in advance for current expenses as the Council may order, and account for the same to the Finance Committee. He shall also superintend the transmission of the Transactions.

SECTION XIV.

AUDITORS.

Charter, line 227.

1. The Auditors shall meet at least one month previous to the Annual Meeting; it shall be their duty to inspect the Accounts of the Society, and the Balance-Sheet prepared for them by the Finance Committee, which must be certified and signed by them, and be presented to the Council at their Meeting in May.

SECTION XV.

SUMMONSES.

FOR ALL MEETINGS OF THE COUNCIL, EXAMINERS, COMMITTEES, OR AUDITORS.

Charter, line

1. Printed summonses shall be issued by the Secretary, with his name attached, and if left at the place of business, or transmitted by post, addressed to the place of business or residence of the person summoned, shall be considered as received.
2. All summonses shall be issued at least three clear days previous to the Meetings, inclusive of the day of issuing

the same, except in the case of Special Meetings; and all notices of motion shall be inserted therein, and also notice of such matters as require particular consideration.

3. The Secretary shall issue summonses, notices, or advertisements convening all Special, Council, or General Meetings. If for the latter, not less than ten clear days' previous notice shall be given; and such summonses, notices, or advertisements shall contain full notice of the business to be discussed at the Special Meeting. Charter, lines 120, 180.

4. Cards of invitation to the Pharmaceutical Meetings and Evening Lectures shall be issued by the Secretary in the name of the Council, to such persons as the Council may direct; and each Member of the Society may, on application to the Secretary, obtain a card for the admission of a friend, to which his own signature must be attached.

SECTION XVI.

FILLING UP VACANCIES BY DEATH, RESIGNATION, OR REMOVAL.

1. In the event of any vacancy occurring in the office of President, Vice-President, or Treasurer, the Secretary shall report the same, and the cause thereof, in the summons for the next Meeting of the Council, who shall thereupon find and declare such vacancy, and immediately proceed to elect from their remaining number a proper person to fill such vacant office. Charter, line 236.

2. In the event of any vacancy occurring in the Council or Auditors, or in the several Committees, during the current year, the Secretary shall report such vacancy and the cause thereof, in the summons for the next Meeting of the Council, at which some Member of the Council, or of the Society, as the case may require, shall be nominated to fill up such vacancy. Charter, lines 155, 236. Act 1868, sec. 18–19.

3. In the event of a vacancy occurring in the office of Registrar or Secretary, the President or Vice-President shall appoint some person, *pro tempore*, to fulfil the duty of the office, and in the summons for the next Meeting of the Council the vacancy shall be declared; and some person or persons being proposed and seconded at such meeting, the election shall take place, but shall not be final, unless confirmed at the next meeting of the Council. Charter, line 236.

SECTION XVII.

REMOVAL OF OFFICERS AND MEMBERS.

1. Every Member of Council who shall commit any act or acts which appear to the Council derogatory to the honour of his office, shall give an explanation of the same to the Charter, lines 165 to 170. Charter, line 236.

Council, on being required so to do, and in default thereof, or if such explanation be unsatisfactory to the Members present, he shall be liable to the censure of the Council, or, if it be deemed expedient, a notice may be given by any Member of the Council for a motion of removal from the Society of the Member so offending, which notice shall be inserted in the summons for the ensuing Meetings of the Council until disposed of, and shall be taken into consideration at the first ensuing Meeting of the Council at which not less than twelve Members thereof shall be present.

Charter, lines 165 to 170.

2. If any report be made to the Council by a Member of the Society in writing, with his name attached, that another Member or any Associate has been guilty of any act or conduct which is contrary to, or subversive of, the interests of the Society, or a violation of its laws and regulations, and if the Council be of opinion that the alleged act or conduct is of such character, the Secretary shall write to the Member or Associate so accused for an explanation, and in default of explanation, or if the same be unsatisfactory, two Members of the Council shall be deputed to communicate, personally or by letter, with such Member or Associate, and shall report the result to the Council; when any Member of the Council shall, if he think it expedient, give notice of a motion for the removal of such Member or Associate from the Society. This notice must be inserted in the summons for the ensuing meetings of the Council until disposed of; and be taken into consideration at the first meeting thereof, at which twelve Members are present.

Charter, line 245.

3. Any Member or Associate, Apprentice or Student, desiring to retire from the Society, shall send notice thereof to the Secretary in writing, together with the certificate or diploma of membership, if any, held by him. No Member or Associate shall be released from his obligation to pay his annual subscription until such time as the certificate or diploma of membership, if any, shall have been returned.

SECTION XVIII.

FUNDS AND PROPERTY.

Charter, lines 36 to 65.

1. The Council of the Society shall from time to time cause such part of the funds in the hands of the Treasurer as may not, in their judgment, be required for carrying on the business of the Society, to be invested in Government or real securities in the corporate name of the Society.

Charter, lines 212 to 225.

2. The property and funds of the Society, other than monies from time to time in the hands of the Treasurer or Secretary, shall not be disposed of, or otherwise dealt with, except in pursuance of an order of the Council of the So-

ciety, signed by six Members, at the least, in Council assembled.

SECTION XIX.

BENEVOLENT FUND.

1. The Benevolent Fund shall consist of donations and subscriptions, and such grants as may from time to time be made by the Council from the General Fund towards the particular objects of such Fund, in addition to the sum already invested in respect of the same Fund. Charter, line 210.
2. Donations in aid of the Benevolent Fund shall be invested in Government or real securities; and no part of the invested capital of such Fund shall be distributed among the recipients of relief. Charter, line 212.
3. The interest accruing from the invested portion of the Benevolent Fund, together with annual subscriptions and grants made from the General Fund in aid thereof, shall be applicable, in the discretion of the Council, towards the relief of persons eligible to receive the same according to the provisions of the Act, 1868, and any unapplied portion of the same in any year may be invested and thenceforward form part of the invested Fund. Act 1868, sec. 22.

SECTION XX.

ANNUAL AND SPECIAL GENERAL MEETINGS.

1. The Council shall prepare a Report of their proceedings during the past year, together with a statement of the funds, which shall be read at the Annual General Meeting, and inserted in the published report of the transactions of the Society. Charter, lines 90 to 100, 113 to 127.
2. The Council shall meet previous to the General Meeting, and arrange the business to be transacted thereat; and the proceedings of the General Meeting shall be considered perfect in themselves without the necessity of reading or confirming the minutes of the preceding Annual Meeting.
3. No business shall be brought forward at any Special General Meeting but that for which it is convened, and of which due notice has been given to the Members of the Society, pursuant to the preceding Bye-law, No. 3, under sec. 15. Charter, line 120.

SECTION XXI.

DIPLOMA AND CERTIFICATES.

1. Every Member of the Society shall be entitled to possess and use a Certificate of Membership. Charter, lines 200, 245.
2. Persons registered as Pharmaceutical Chemists under

Charter, lines 200, 243.

Section 10 of the Statute 1852, shall be entitled to possess and use a Diploma stamped with the seal of the Society.

Stat. 1852, sec. viii. Act 1868, sect. vi.

3. All persons examined, pursuant to the Bye-laws, shall, after having passed their examinations and been registered, receive appropriate Certificates.
4. All plates used from time to time for printing the several forms of Diploma and Certificate shall be deposited at the house of the Society, in a box having a lock and two keys, one of which shall be in the custody of the President and the other in that of the Vice-President.
5. No print shall be taken from the said plates, or any or either of them, without an express order of the Council. All prints taken shall be in the custody of the Secretary.
6. Every Diploma and every Certificate of Membership shall be signed by the President and Vice-President, and countersigned by the Secretary or Registrar. Every Certificate of Examination shall be signed by the Board of Examiners, or at least four members thereof.
7. Diplomas and Certificates shall be in such form as shall from time to time be determined upon by the Council.
8. Every person ceasing to be a Member of the Society shall forthwith deliver up to such person as the Council shall order the Certificate of Membership furnished to him, pursuant to the preceding Bye-laws.

Stat. 1852, sec. ii.

9. All persons pirating or imitating or improperly using any Diploma, or any or either of the Certificates, or the Common Seal of the Society, or falsely holding themselves forth to the public by means of advertisements, handbills, labels, circulars, or otherwise, as Members of the Society, or registered under the Statute, 1852, or Act, 1868, will be subject to legal proceedings, and the Council shall from time to time order the same in their discretion.

SECTION XXII.

JOURNAL AND TRANSACTIONS.

Charter, line 6.

1. The PHARMACEUTICAL JOURNAL (the copyright of which now belongs to the Society) shall be edited, printed, and published in such manner as the Council shall from time to time direct.

Charter, line 125.

2. The Transactions of the Society required by the preceding Bye-laws to be published, shall be inserted in the said Journal, and all notices or advertisements shall be considered duly made or given if inserted therein.

SECTION XXIII.

PHARMACEUTICAL MEETINGS.

1. Evening Meetings may be held at the house of the Society, as the Council shall from time to time direct, for the read-

ing of papers and discussion of subjects relating to the objects of the Society.

2. Notice of such Meetings shall be given in the PHARMACEUTICAL JOURNAL next preceding.
3. All communications intended to be made at such Meetings shall be submitted to the President, or, in his absence, to the Vice-President, or to the Chairman of the Meeting, for his sanction, and without such sanction no subject shall be introduced.

SCHEDULE.

THE MODIFIED EXAMINATION FOR ASSISTANTS UNDER THE PHARMACY ACT, 1868.

AS APPROVED BY THE PRIVY COUNCIL.

Candidates will be examined in the following subjects:—

PRESCRIPTIONS.

Candidates will be required to read Autograph Prescriptions, translate them into English, render a correct Translation of the Directions for Use, and detect Unusual Doses.

PRACTICAL DISPENSING.

To weigh, measure, and compound Medicines, write the Directions in suitable language, finish and properly direct each Package.

MATERIA MEDICA AND QUALITY OF SPECIMENS.

To recognize the Pharmacopœia Chemicals in frequent demand, and specimens of Roots, Barks, Leaves, Fruits, Resins, and Gums in ordinary use; the following Plants, either in a fresh or dried state, or from plates:—Belladonna, Stramonium, Hyoscyamus, Conium, Aconitum, Digitalis, and Sabina; also to estimate the quality of each specimen submitted, and its freedom from adulteration.

PHARMACY.

To recognize the Preparations of the Pharmacopœia which are not of a definite Chemical Nature, such as Extracts, Tinctures, and Powders, and give the proportions of the more active ingredients.

FORM OF BEQUEST.

TO THE GENERAL OR BENEVOLENT FUND.

"*I give and bequeath the sum of* *unto the* PHARMACEUTICAL SOCIETY OF GREAT BRITAIN, *the same to be paid out of my pure personal estate, and to be applied for the purposes of the* GENERAL OR BENEVOLENT FUND *of the said Society.*"

N.B.—Devises of land and bequests of money savouring of realty, or, in other words, connected in any way with land, will be void.

THE SANDFORD TESTIMONIAL FUND.

LIST OF CONTRIBUTIONS—*continued.*

	£.	s.	d.
Amount published in the December Journal	298	19	6

	£	s.	d.
Abingdon, H. J., Ringstead ..	0	5	0
Adams, R. W., Dover	0	5	0
Alexander, J. S., Greenock ..	0	5	0
Allcock, J. F., North Walsham	0	10	0
Allen, A. W., Lymington....	0	5	0
Andrews, F., Bayswater	0	5	0
Anness, S. R., Ipswich	0	5	0
Ansley, J. W., Bath	0	3	6
Atherton, J. H., Nottingham.	0	10	6
Babington, C. H., Bridlington	0	5	0
Badcock, H., Lymington	0	5	0
Bailey, H. F., Brighton.....	0	10	6
Bailey, G. W., North Walsham	0	2	6
Baker, C. P. & G., Chelmsford	1	1	0
Baldwin, G., Greenwich Rd...	0	5	0
Barber, J., Red Lion Sq.	0	5	0
Bardsley, Henry, Ryecroft ..	0	2	6
Barrtt, F. J., Newark	0	2	6
Barry, J. and E., Northampton	1	1	0
Bass, William T., Enfield....	1	1	0
Bayley, John L., London	1	1	0
Bayley, J. T., Brownhills....	0	3	0
Bayley, E., Walworth Road..	0	10	6
Beale, E. J., Ilford	0	5	0
Bell, W. H., Bath	0	5	0
Bell, W., Yarmouth	0	2	6
Bell, Mr., Bradford	0	10	6
Bennet, R., Tunbridge Wells.	0	5	0
Bimrington, J. R., Filey	0	5	0
Bingley, Mr., Northampton..	0	10	6
Bishop, Alf., London	1	1	0
Black, Jas., Leven	0	2	6
Blackburn, Mr. B., Bradford .	1	1	0
Blacklock, J. D., Brighton ..	0	5	0
Blanchford, T. C., Yarmouth	0	5	0
Bland, J. H., Stourbridge....	0	10	6
Bowring, J. W., Cardiff	0	10	6
Boyce, Alfred	0	2	6
Braddock & Bagshaw, Oldham	0	5	0
Braithwaite, J. C., 54, Kentish Town Road	1	1	0
Brearey, W. A., Douglas, Isle of Man	0	5	0
Brew, T. A., Brighton	1	1	0
Broad, Jno., Hornsey Rise ..	0	10	6
Brodie, R., Glasgow	0	2	6
Brooks, C., Wandsworth Rd...	0	5	0
Broughton, H., Leeds.....	0	5	0
Brown, P., Glasgow	0	5	0
Brown & Smart, 27, Aldgate..	0	10	6
Browne, W., Walworth Rd...	0	2	6
Buchanan, J., Edinburgh	1	1	0
Buchanan, D., Greenock	0	2	0
Buck, J., Kingsland	0	10	6
Burgess, W., Stourbridge....	0	5	0
Bush, T., Poulton, near Bristol	0	5	0
Butler, E. D., London	0	5	0
Bygott, W. T., Huddersfield .	0	5	0
Cannon, C., Islington	1	1	0
Carr, H., Tunbridge Wells ..	0	10	0
Chalmers, Robert, Greenock..	0	2	6
Chaplin, J. L., Colchester....	0	5	0
Chapman, H., Ipswich	0	5	0
Chapman, W., Colchester....	0	2	6
Chase, Thos., Holborn	0	10	6
Chater and Son, Watford	0	10	0
Cheverton, G., Tunbridge Wells	0	5	0
Chubb, Mr., 102, St. John St., E.C.	0	10	6
Clarabut, J. D., Deal	0	5	0
Clarence, F. R., Colchester ..	0	5	0
Clark, G. B., Woburn.....	0	10	6
Cleaver, E., 63, Oxford Street	1	1	0
Cleminshaw, Mr., Bury.....	0	2	6
Clifton, Mr., Bury	0	5	0
Cock, John, Falmouth	0	5	0
Cole, F. A., Colchester	0	5	0
Coleman, E. J., Cardiff.....	0	5	0
Collings, Jas., Littlehampton .	0	2	6
Collins, H. G., Windsor.....	0	5	0
Cooper, M. W., Bridlington..	0	5	0
Corbin, G. D., Lymington....	0	5	0
Cornell and Cornell, Ipswich .	0	10	6
Crapper, John S., Hanley....	0	5	0
Cripps, J., Reepham	0	5	0
Cross, W., Cardiff	0	5	0
Cunningham and Sparrow, Pimlico.....	2	0	0
Cushion, H., Colchester.....	0	2	6
Dadford, Mr., Northampton..	0	5	0
Davis, D. F., Leominster	0	10	6
Delondre, A., Sèvres	0	4	0
Dickins, J., Bridlington Quay	0	5	0
Dickinson, J., Gt. College St.	0	10	6
Dickinson, Mr., Stamford....	0	5	0
Drane, P., Cardiff	0	5	0
Drury, G. S., Gravesend	0	10	6
Duncan, Flockhart and Co., Edinburgh	2	2	0

	£	s.	d.
Duncan, S., Greenock	0	2	6
Dyer, A. J., West Brixton....	0	5	0
Edes, G. A., Grandhurst	0	5	0
Edisbury, J., Liverpool.....	0	5	0
Edwards, J. J., London.....	0	5	0
Eedes, J. W., Marsden	0	3	0
Ekin, Chas., Bath	0	10	0
Ellis, T. W., Loddon.....	0	5	0
Farrer, W., Wrentham	0	5	0
Fells, John, Clapham.....	0	2	6
Fentiman, G., E. Smithfield..	0	5	0
Ferguson, J., Greenock.....	0	5	0
Fisher and Sons, Ramsgate. ..	1	1	0
Forge, C. H., Bridlington Quay	0	5	0
Forrest, R., 20, Cork Street ..	1	1	0
Forster, Mr., Dover	0	5	0
Foster, Edward, Preston	0	2	6
Fox, G., Birmingham	0	2	6
Fox, W. and Son, Shoreditch.	1	1	0
Freeman, R., Kennington Park Road.....	0	5	0
Freeman, R. T., Lewisham...	0	5	0
Friend, *per* G. Patterson	0	2	6
Gale, H., 3, Millbrook Place, Harrington Square.....	0	10	6
Gankley, W. B., Arnold	0	2	6
Gardener, C., Tunbridge Wells	0	10	6
Gardner & Ainslie, Edinburgh	1	1	0
Gaunt and Fuller, Union Street, Borough	0	10	6
Gedge, W. S., Clerkenwell...	0	10	6
Gill, G. W., Walworth Rd...	0	2	6
Gillet, C., Cambridge	0	5	0
Glanville, Francis, London ..	0	5	0
Godfrey, F., Newton Abbot ..	0	2	6
Goodwin, J., Lower Clapton..	0	5	0
Gower, A., Tunbridge	0	10	6
Graham, J., Greenock	0	2	6
Greaves, E. S., Cardiff	0	5	0
Green, R., Greenwich	0	10	0
Greenall, A., Everton	0	2	6
Greig, W., Glasgow	0	5	0
Griffin, H. S., Burton-on-the-water	0	5	0
Griffin, J. E., Bolton	1	1	0
Grindall, Mr., Hull	0	2	6
Gristock, T., South Street. ...	0	5	0
Groves, H., Florence	1	1	0
Guest, E., Brentwood	0	10	6
Gunner, J., Lambeth Walk..	0	5	0
Guthrie, P., Glasgow.....	0	5	0
Gwatkin, J. T., Brighton....	0	10	0
Hâley, Richard	0	5	0
Hallaway, J., Carlisle	0	5	0
Hammerton, E., Colchester ..	0	5	0
Hamp, J., Wolverhampton ..	0	5	0
Hands, J., Campden	0	10	0
Hargreaves, H. L., Oldham ..	0	5	0
Harris, G., Crickhowell	0	5	0
Harrison, J. P., Carlisle	0	5	0
Harrison and Parkinson, Bradford	1	1	0
Harney, T., Leeds	0	5	0
Hart, H., Glasgow.....	0	2	6
Harwood, E. J., Bolton.....	1	1	0
Hatrick, R., Glasgow	0	5	0
Hawkes, R., Colchester.....	0	2	6
Heeley, J., Kennington Rd...	0	5	0
Heuthorn, J., Oldham	0	2	6
Hicks, Mr. J., Bradford	0	10	6
Hickey, Evan L., London....	0	5	0
Higgins, Mr., Stamford	0	5	0
Hill, W. T., Cardiff	0	2	6
Hillridge, George, Preston ..	0	2	6
Hodgson, G. S., Greenwich ..	0	5	0
Hook, E., Dover.....	0	2	6
Hornsby, J. H., Odiham	0	2	6
Houghton, William, Preston .	0	5	0
Howard, R., Tunbridge Wells	0	10	6
Howard, Geo., Greenwich....	0	10	0
Howell, Maurice.....	0	10	6
Hughes, S., Stourbridge	0	10	6
Hughes, H. D.	0	5	0
Hunter, James, Dewsbury ..	0	5	0
Hutchison, M., Greenock	0	5	0
Hyne, W. F., Greenock	0	2	6
Hyslop, J. C., Edgware Rd...	0	5	0
Jaap, J., Glasgow	0	5	0
Jackson, Mr., Stamford.....	0	2	6
Jackson, Bros., Middleton ..	0	2	6
Jackson and Co., Westwood..	0	5	0
Jackson, James, Heywood ..	0	2	6
James, J. P., Cardiff	0	10	6
Johnson, B., Tottenham Court Road.....	0	12	0
Johnson, J., 152, Upper St., N.	0	10	0
Jones, F., Flint	0	5	0
Jones, H., Llangollen	0	5	0
Jones, James, Salford	0	5	0
Jones, W., Shepherds' Bush..	0	5	0
Jones, J. T., Milford Haven..	0	3	0
Jones, R. Y., Stourbridge....	0	5	0
Joy, F. W., Cardiff	0	10	6
Kaye, H., 205, Holloway Rd..	0	10	6
Keen, J., Southwark Street ..	0	2	6
Kemp, R., Huddersfield	0	5	0
Kennedy, W., Glasgow.....	0	5	0
Kennerstone, F., Hoxton	0	2	6
Kent, Mr., Bath.....	0	5	0
Kerr, Jos., Greenock.....	0	2	0
King, Mr. (late Hodgkinson, Luckombe, and King)	2	2	0
Kinninmont, A., Glasgow ..	1	1	0
Kirk, C., Kimberley	0	2	6

	£	s.	d.
Lane, J. W., Southwark St...	0	2	6
Laurence, John, Glasgow	0	5	6
Lear, Mr., Bath	0	10	0
Leguera, H. L., Aldgate	0	10	6
Loverock, Henry, Stourbridge	0	5	0
Lyon, R., Ipswich	0	5	0
M'Carthey, C. G., Cardiff....	0	5	0
M'Creery, J., Kennington Pk...	0	5	0
M'Dearmid, Mr., Deal	0	5	0
M'Minn, J., Manchester	0	2	6
M'Minor, J., Manchester	0	2	6
Macpherson, A., Stornoway ..	0	4	0
Maddock and Harrow, Tunbridge Wells	0	10	6
Mainprize, E., Bridlington ..	0	2	6
Manning and Son, Yeovil....	0	10	6
Manthorp, F. W., Colchester..	0	2	6
Manthorp, R., Colchester	0	2	6
Manthorp, S., Colchester	0	5	0
Marchant, C., Ipswich	0	5	0
Mayger, Mr., Northampton..	0	10	6
Merrikin, Mr., Bath	0	10	6
Meyrick, Mr., Northampton..	0	5	0
Middleton, J., Middlesbro' ..	0	5	0
Mildren, W., Hayle	0	2	6
Miller and Co., Tunbridge Wells	0	10	6
Miller, H., Battersea	0	2	6
Millidge, T. E., Tunbridge ..	0	5	0
Milne, G., Arbroath	0	2	6
Milne, P., Arbroath	0	10	0
Moore, J., Pembroke Dock ..	0	5	0
Morgan, Frank G., Petworth.	0	5	0
Morris, T., Southwark St.....	0	2	6
Moss, W., Carlisle	0	5	0
Mousley, William, Redditch..	0	5	0
Mumbray, H. G., Manchester.	0	5	0
Mumbray, R. G., Richmond ..	0	5	0
Newey, J. T., Bloomsbury Sq.	0	5	0
Newton, W., Saddleworth ..	0	2	6
Nicholson, A., Tunbridge Wells	0	10	6
Nix, J., Billericay, Essex	0	5	0
Nix, J., jun., Billericay, Essex	0	5	0
Noakes, Rich., Brighton	0	10	0
Orpe, T. M., Old Kent Rd. ..	0	10	6
Owers, R. C., Southwark St...	0	2	6
Owles & Son, Yarmouth	0	10	6
Paget, J., Loughborough	0	5	0
Panes, G., Southborough	0	5	0
Parry and Garnham, London Bridge	0	10	6
Pars, R. C., Thrapston	0	5	0
Pasmore, James, London	0	5	0
Patterson, G., Stamford	0	5	0
Pearce, Josh., Crewkerne	0	10	0
Perks, F., Stourbridge	0	5	0
Phillips, W., New Cross Road.	0	5	0
Philpot, J. K., Newnham	0	5	0
Pickering, B., Brompton, S.W.	0	10	6
Pitts, R. C., Norwich	0	10	0
Plank, A. C., Dover	0	2	6
Poll, W. S., Yarmouth	0	2	6
Ponsford, J., Newton Abbot..	0	5	0
Pooley, J. C., Bath.....	0	5	0
Potts, Mr., South Audley St..	1	0	0
Preston, A. P., Blackman St...	0	2	6
Price, E., Cardiff	0	5	0
Price, J., Southwark Street ..	0	1	0
Prosser, E. T., Colchester	0	5	0
Provost, Mr., Stamford	0	5	0
Pullin, Mr., Northampton ..	0	5	0
Quarrington, Mr., Bath.....	0	5	0
Quibell, Thos. O., Newark ..	0	5	0
Quiller, C. R., London	0	10	6
Radley, Wm. V., Sheffield ..	1	1	0
Raimes, Blanchard, and Co., Edinburgh	1	1	0
Ramsbottom, Geo., Waterfort	0	5	0
Randall, F., Colchester	0	2	6
Rawling, J., Hackney Rd....	0	5	0
Rayner, Lloyd, Poplar	0	5	0
Rees, Mr., Stamford	0	2	6
Richards, H., Southwark St...	0	2	6
Richards, W. R., Camberwell Road.....	0	10	6
Robertson and Co., Edinburgh	1	1	0
Robertson, W., Elgin	0	5	0
Robinson, J., Middlesbro'	0	2	6
Robinson, J. C., sen., North Shields	0	5	0
Roderick, Thos., Pontypool ..	0	5	0
Rogerson and Son, Bradford .	1	1	0
Rose, Mr., Glasgow	0	2	6
Rouse, F. J., Clapham	0	5	0
Rowe, C. R., Middlesbro'	0	2	6
Russell, C. J. L., Windsor ..	0	10	6
Saukerhen, W., Bath.....	0	2	6
Savidge, J. Mason, Nottingham	0	5	0
Sawyer, J., Carlisle	0	5	0
Sealy, W., Southwark Street..	0	2	6
Sells, R., Tunbridge Wells ..	0	10	0
Shenstone, J., Colchester	0	5	0
Shenstone, W. A., Colchester.	0	2	6
Shipman, Mr., Northampton..	0	5	0
Silverlock, H., 17, Earl St., E.C.	1	1	0
Silvers, Mr., Yarmouth.....	0	2	6
Silvester, J., 86, King's Road Bridge	1	1	0
Simpkins, J., Minchinhampton	0	5	0
Simpson, Mr., Colchester	0	2	6
Slater, Thomas, Stone, Stafford	0	5	0
Slater, T., Stoney Stratford ..	0	5	0
Smart, N., Littlehampton....	0	5	0
Smith, W. P., Bridlington ..	0	5	0

	£	s.	d.
Smith, J., Bridlington	0	2	6
Smith & Wilkinson, Seaham..	0	10	0
Smith, C. S., Cirencester	0	10	0
Smith, Mr., Ipswich	0	2	6
Smith, T. & H., Lond. & Edin.	2	2	0
Smith, Simpson, Middlesbro' .	0	5	0
Southall, Son, and Dymond, Birmingham	2	2	0
Sowerby, R., Middlesbro'	0	2	6
Speechly, G., Bishop Stortford	0	5	0
Speller, J., Southwark Street.	0	2	6
Stagg, J. H., Yarmouth.....	0	2	6
Stansfield, R., Haverstock Hill	0	5	0
Stevens, P. A., Hoxton	0	10	6
Stewart, Chas. S., Cardiff....	0	10	0
Sughs, W. G., Cardiff	0	5	0
Summer, R., & Co., Liverpool	2	2	0
Sutcliffe, J., Clapham	0	2	6
Sutton, F., Norwich	0	10	6
Tait, W., Edinburgh	1	1	0
Taylor, R., Ryde	0	10	6
Taylor, W. J., Middlesbro' ..	0	5	0
Taylor, W. R., Middlesbro' ..	0	2	6
Taylor, H. H., Middlesbro' ..	0	2	6
Thetford, H., Ilminster.....	0	10	0
Thomas, H. J., Bath	0	5	0
Thomas, R. and J., Burnley .	1	1	0
Thomas, Samuel, Stanstephen	0	2	6
Thompson, A., Carlisle	0	5	0
Todd, L., Preston	0	5	0
Turner, John, Aylesbury	0	10	6
Tylee, Mr., Bath	0	10	6
Tyron, W. G., Landport	0	5	0
Uttley, Mr., Liverpool	0	5	0
Vinter, T. D., Sunderland ..	0	10	6
Walker, Mr., Bradford	0	10	6
Walker, W., Preston.....	0	2	0
Walsh, J. E., Tunbridge Wells	0	10	6
Warin, J., Blackman Street..	0	5	0
Wastie, F., Kennington Cross	0	5	0
Watson, J. B., Chippingwell..	0	2	6
Watson, H., Cambridge.....	0	5	0
Watterton, W., Wandsworth Road	0	2	6
Welch, J., Stourbridge	0	2	6
Welch, J. J., Stourbridge	0	2	6
Welchman, Mr., Northampton	0	5	0
White, F., Nottingham.....	0	5	0
White, W., Greenock.....	0	2	6
Whiteman, T., Ipswich.....	0	5	0
Whittaker, W., Runcorn	0	5	0
Whittle, E.C.C., St. John's Wood	0	5	0
Whitwell, G., Stourbridge ..	0	5	0
Wiggin, J., Ipswich	0	5	0
Wiggins, Henry	0	7	6
Wild, W., Oldham.....	0	5	0
Wilkins, G. M., Colchester ..	0	2	6
Wilkinson, Bridge, and Co., Regent Circus	0	5	0
Williams, J., 5, New Cavendish Street	2	2	0
Williams, G. L., Burnham ..	0	2	6
Williams, C. G. T., Bath	0	2	6
Williams, W. H., Hayle	0	2	6
Williams, R., Brixton	0	5	0
Williams, T., Cardiff.....	0	10	6
Williamson, J., Scarborough .	0	5	0
Willsher, S. H., Tenterden ..	0	5	0
Wilmer, L. M., Tunbridge ..	0	5	0
Wilson, Dr. J. A., London ..	1	1	0
Wilson, Richard, Clay Cross .	0	5	0
Wilson, S., *per* H. Bardsley ..	0	2	6
Wilson, William, Hanley....	0	5	0
Wilson, J. F., Essex Road ..	0	5	0
Wright, G. H., 7, Poultry ..	1	1	0
Wright, G., Birmingham	0	5	0
Wright, G. F., Gloucester Pl.	0	2	6
Wright, J., Yarmouth	0	1	0
Young, R. F., New Barnett ..	0	10	6
Young, William	0	5	0
Young, Richard, Preston	0	2	6

MICHAEL CARTEIGHE, 172, *New Bond Street, London, W.*
JOHN MACKAY, 119, *George Street, Edinburgh.*
HENRY MATTHEWS, 60, *Gower Street, London, W.C.*
Hon. Secs.

N.B.—Donations should be made payable to the Treasurer, Mr. B. B. ORRIDGE, or to ELIAS BREMRIDGE, 17, Bloomsbury Square, London, W.C.

The Hon. Secs. request the Members of the Committee and the Local Secretaries to send their lists to London as soon as possible, a few only having been received.

PROVINCIAL TRANSACTIONS.

LIVERPOOL CHEMISTS' ASSOCIATION.

Third General Meeting, held at the Royal Institution, November 12, 1868; the President, Mr. J. F. Robinson, in the chair.

The following gentlemen were elected members:—Mr. Tanner, Fairfield, and Mr. H. Smith, West Derby Road.

Donations were announced of the Proceedings of the American Pharmaceutical Association, 1867; the Proceedings of the Liverpool Architectural Society; the Proceedings of the Liverpool Polytechnic Society; Report of the Liverpool Naturalists' Field Club; New York Druggists' Circular.

Thanks were voted to the donors.

Mr. Tate mentioned some recent applications of oxide of zinc in medicine for the cure of consumption, epilepsy, delirium tremens, etc.

Mr. Betts asked if the Pharmacy Act was now in force so far as related to the registration of poisons.

Mr. Abraham said that in his opinion no part of the Act came in force until the 1st of January except the registration of names.

Mr. Sharp said that Mr. Flowers, a magistrate in London, had decided that the registration of poisons was now required.

Mr. Abraham invited subscriptions to the Sandford Testimonial Fund, and said that Mr. Sandford was entitled to the greater part of the credit due for the passing of the Bill. He thought that they had reason to be thankful both for what the Bill did and did not contain.

Mr. Samuel exhibited "Flor de Copey," a product of a tree growing in Cuba, containing a large quantity of resin, said to be good as an application to wounds.

Mr. A. N. Tate, F.C.S., then read the first part of a paper on "The Study and Practice of Pharmacy, with special reference to the new Pharmacy Bill."

He gave a short account of the history of Pharmacy, reading several extracts from Homer. He advocated the division of labour, considering that Pharmacy was quite sufficient for the occupation of one man, without combining with it the duties of the physician and surgeon, and gave his views as to the proper sphere of each. He approved of the use of Latin in writing prescriptions, and gave as a list of subjects with which a pharmaceutist should be acquainted, English, Latin, French and German, Chemistry, Botany, Materia Medica. He thought that apprentices went to the business too young, and preferred pupilage to apprenticeship.

The President said that as the time was then far advanced, it would be better to postpone discussion until the remaining portion was read.

After a vote of thanks to Mr. Tate had been passed, the meeting adjourned.

Fourth General Meeting, held November 26th, 1868; the President in the chair.

Mr. Edward Roberts, Sandhills Lane, was elected a member, and Messrs. J. Clough and G. A. Redford, Associates.

Mr. Tate read an extract from the 'Courier' relative to the Pharmacy Bill, and a letter which he had received from Mr. Sandford about the registration of poisons.

Mr. Bird exhibited a specimen of cold cream, and gave the following proportions for making it:—

White Wax	1 oz.
Spermaceti	1 oz.
Almond Oil	8 oz.
Water	4 oz.
Borax	100 to 120 grains.

Mr. Robinson exhibited a bottle with poison shield, invented by Mr. Jarvis, New Brighton.

Mr. Shaw called the attention of Chemists and Druggists to the necessity of registering before the 31st of December, if they would avoid the payment of a heavy fee.

Mr. Tate then read the second part of his paper on "The Study and Practice of Pharmacy with special reference to the new Pharmacy Bill."

Continuing his remarks with regard to apprentices, he said that there should be a compulsory examination in Botany and Chemistry before apprenticeship; that masters should pay more attention to the studies of apprentices, giving them time during the day, and facilities for attending lectures. At the conclusion of the apprenticeship he recommended a course of laboratory study, and another compulsory examination before taking an assistant's situation. He feared that young men, by laziness and neglect of their present opportunities, sometimes deterred masters from affording more. He thought it desirable that local examinations should be held.

In the practice of pharmacy, he held it the duty of the chemist to examine the drugs which he received, and to adhere rigidly to the Pharmacopœia. He disliked secret formulæ, and denounced the sale of patent medicines as a system of quackery from beginning to end, especially those for the cure of secret diseases.

Mr. ABRAHAM said that the Minor examination was originally intended for assistants, and would meet Mr. Tate's views if it were rendered compulsory before an apprentice could become an assistant.

Mr. SHARP was disappointed with the paper, as it contained no practical information or suggestions to chemists and druggists as to their position under the new Act. He had no sympathy with the present excessive rage for scientific learning, which would not allow a joiner to make a table unless he knew all about the botany of the trees which yielded the wood with which he worked. With regard to pupilage, he thought that at present it was more in use than apprenticeship; that it was impossible to make chemists' shops laboratories or schools of pharmacy; and in country places he would tolerate counter-prescribing in simple cases.

Mr. SYMES differed from the last speaker with regard to scientific knowledge. He did not think that pupilage would answer, and believed that apprentices lost much time that they might very well improve. He thought that a chemist could find time, and ought, to analyse his drugs, and that he should have an ever-present feeling of his responsibility.

Mr. REDFORD said that the members must feel that the labour and research of Mr. Tate deserved their thanks, and proposed a vote to that effect.

Mr. Sharp seconded the vote, which was carried unanimously.

THE MANCHESTER CHEMISTS AND DRUGGISTS' ASSOCIATION, FOR MANCHESTER AND DISTRICT.

LECTURE ARRANGEMENTS FOR THE PRESENT SESSION.

Chemistry.—A course of twenty lectures on chemistry, with special reference to pharmacy, will be given at Owens College, Manchester, on Wednesday evenings, at six, P.M., commencing January 13th, 1869, when Professor ROSCOE, B.A., F.R.S., Ph.D., etc., will deliver the introductory lecture. The course will be continued by C. SCHORLEMMER, Esq., F.C.S. Fee 7*s.* 6*d.* It is hoped that Principals, as well as Assistants and Apprentices, will take tickets for this course, and be present at Professor ROSCOE's lecture. Non-Members will be admitted to this course only at 10*s.* 6*d.*

Materia Medica.—A course of twelve lectures will be delivered at Union Chambers, 15, Dickinson Street, Manchester, on Monday evenings, at 7.30, P M., by A. SOMERS, Esq., Lecturer on Materia Medica, at the Manchester Royal School of Medicine, commencing January 11th, 1869. Fee 6*s.*

Latin.—Classes will be held at Union Chambers, 15, Dickinson Street, Manchester, on Monday evenings, at six, P.M., by J. SMITH, Esq., B.A., commencing January 11th, 1869. Fee for the course of twenty lessons, 5*s.*

The course of lectures on botany has been postponed till the summer, sufficient names not having been sent in to justify its immediate commencement.

The room at 15, Dickinson Street, will be kept open on Monday evenings, after the conclusion of Mr. SOMERS's lecture, till ten, P.M., for the use of Members and Associates for reading and social intercourse.

The next monthly meeting of the Association will be held at 15, Dickinson Street, on the *second* Friday in January, at three, P.M., the *first* Friday being New Year's Day.

Gentlemen willing to contribute papers or objects of interest, for these meetings, are requested to communicate with the Secretary at their earliest convenience.

Tickets for admission to the lectures and classes are now ready, and can be obtained of F. Baden Benger, *Hon. Sec.*, 1, Market Place, Manchester.

HULL CHEMISTS' ASSOCIATION.

The annual dinner of the above Association was held at the Paragon Hotel, Dec. 10. There was a good attendance, and the chair was occupied by Mr. Burn, and the vice-chair by Mr. Hammond. The Chairman, having given the loyal and patriotic toasts, proposed "The Town and Trade of Hull." Mr. A. Smith responded to the toast, remarking upon the development of the trade and commerce of the town. Mr. Stanning proposed the toast of the evening, "Success to the Association," and, in doing so, alluded to the great success which had attended its operations. Mr. Hammond acknowledged the toast and endorsed the observations of Mr. Stanning, and his remarks were received with general applause. Mr. Hollingsworth proposed "The Secretary and Treasurer." Mr. Bell responded in a very able speech. Mr. Dobson proposed "The Ladies," and Mr. J. B. Marsden, in a very humorous and singularly appropriate speech, responded.

DUNDEE CHEMISTS AND DRUGGISTS' ASSOCIATION.

The first meeting of the second session of the Dundee Chemists and Druggists' Association was held in Lamb's Hotel, on Wednesday evening, December 9th, Mr. William Laird in the chair. The first business of the meeting was to elect office-bearers for the ensuing year, but it was resolved first to consider the propriety of increasing the rate of subscription for membership, so that a greater amount of funds might be at the disposal of the Society for carrying out the idea of procuring a suitable meeting-room, gradually forming a library, and being in a position to take advantage of any opportunity for laying the nucleus of a museum, and otherwise to make the Association more worthy of the support of every member of the profession in town. After several opinions had been elicited, it was moved, seconded, and passed unanimously, that members' subscriptions should be doubled in the case of masters and assistants, that of apprentices remaining as before. Office-bearers were then elected as follows:—President, Mr. David Russell; Vice-President, Mr. William Laird; Treasurer, Mr. W. P. Henderson; Secretary, Mr. James Hodge. Committee—Messrs. D. H. Ferrier, William Doig, Charles Kerr, William Park, George Jack, P. J. Donald, and the office-bearers *ex officio*: Mr. Doig, convener. The paper for the evening was on "Heat," by Mr. Jack, which he treated in a most lucid and popular manner; it was of a lengthy character, and being well illustrated by diagrams and several successful experiments, was listened to with much attention throughout. Several of the members, in noticing the paper, took occasion to enlarge on the great use of the physical sciences in the profession to which they belonged, lamenting that the teaching of such branches was conducted too much in a negative fashion, and hoping that the younger members of the business would endeavour to qualify themselves in such matters, as well as simply to attend to the ordinary routine of counter-work. There being no other business of importance, a vote of thanks to the chairman, and to Mr. Jack for his able paper, terminated the proceedings.

ORIGINAL AND EXTRACTED ARTICLES.

NOTES AND ABSTRACTS IN CHEMISTRY AND PHARMACY.

BY C. H. WOOD, F.C.S.

The Sulpho-Carbolates. Sulpho-Carbolate of Zinc.

The sulpho-carbolates have been recently introduced into medicine. Dr. Sansom exhibited some time since the sulpho-carbolates of potassium, sodium,

and magnesium, at a meeting of the Medical Society, and recommended their use for the antiseptic treatment of cholera and zymotic diseases generally. In the 'Lancet' of December 7, an account is given of the use of sulpho-carbolate of zinc in King's College Hospital, by Mr. John Wood. It is prescribed in aqueous solution of from 3 to 6 grs. to the ounce, as an injection in the treatment of gonorrhœa, and also as a dressing for wounds and sores. Mr. Wood has found it of great service in all cases to which the use of carbolic acid is applicable.

The sulpho-carbolates are readily prepared by heating pure carbolic acid with oil of vitriol, diluting the mixture with water and saturating the solution with a base. By evaporation the sulpho-carbolate of the base may be obtained in crystals.

Sulpho-carbolate of Sodium.— Two volumes of pure carbolic acid are mixed with one volume of oil of vitriol in a glass flask, and the mixture heated to 280° or 290° F. This temperature is maintained for about five or ten minutes, and the liquid is then allowed to cool. About six or eight volumes of water are added, and the solution carefully neutralized with carbonate of soda. The liquor is evaporated and allowed to crystallize. The salt is deposited in rhombic prisms, which should be well drained on white filtering-paper, and dried by exposure to the air. The mother-liquor possesses a pinkish-brown colour, but with care this may be completely drained away, leaving the crystals colourless and pure.

Sulpho-carbolate of Zinc.—Two volumes of pure carbolic acid are mixed with one of oil of vitriol, and heated for five minutes to 290° F., then cooled, diluted with water, and gently warmed with a slight excess of pure oxide of zinc. The solution is filtered, evaporated, and allowed to crystallize. The salt separates in brilliant right rhombic plates, which are quite colourless after they have been well drained on bibulous paper. They should be dried by exposure to the air. Sulpho-carbolate of zinc is freely soluble in water and in alcohol.

The other sulpho-carbolates are obtained in a precisely similar manner to the foregoing. The magnesium salt forms white needle-shaped crystals, the ammonium salt is deposited in scales, the barium salt in spherical groups of microscopic needles, and the silver salt crystallizes indistinctly. They are all soluble in water and in alcohol.

These salts in solution give no precipitate with chloride of barium, but if a crystal be boiled for several minutes with concentrated nitric acid, and the liquid diluted with twice its volume of water, an abundant deposit of picric acid is formed, and the filtrate then gives the characteristic reaction of sulphuric acid with a salt of barium.

Sulpho-carbolic acid has been obtained by exactly decomposing sulpho-carbolate of baryta with sulphuric acid, and evaporating the filtrate *in vacuo*. It forms slender needle-shaped crystals.

Sulpho-carbolic acid is analogous to sulpho-vinic acid, having the composition

$$(C_6H_5)\,HSO_4.$$

The formula for sulpho-carbolate of sodium is

$$(C_6H_5)NaSO_4+Aq,$$

and that of sulpho-carbolate of zinc—

$$(C_6H_5)_2Zn''(SO_4)_2+Aq.$$

Synonyms.—Sulpho-carbolic acid is otherwise named sulpho-phenic acid o phenyl-sulphuric acid.

Syrup of Iodide of Iron and its Preservation.

M. Jeannel, taking advantage of the power glucose possesses to reduce a per-salt of iron at ordinary temperatures, recommends the following formula for the preparation of a solution of iodide of iron which shall remain unchanged by exposure to the air.

Iodine	8·2 parts.
Iron filings	4·0 ,,
Distilled water	20·0 ,,
Honey	70·0 ,,
Tartaric acid	0·5 ,,

Mix the iodine, iron, and water, in a flask, and when combination is complete, filter the green solution, and add the honey and tartaric acid. The product will contain 10 per cent. of iodide of iron. This preparation, after remaining exposed to the air in a phial simply closed with paper for two months, was still bright and free from colour. It contained no free iodine, or ferric salt.

M. Jeannel has observed that the addition of one five-thousandth part of tartaric acid to syrup of iodide of iron, which has become bad, renders it clear and, at the same time, notably diminishes its inky taste.

The Purification of Sulphide of Carbon.

M. Millon recommends the following method for purifying sulphide of carbon :—The sulphide is first washed several times with water, and then introduced into a large retort with a quantity of quicklime. After twenty-four hours' contact, the sulphide is distilled from the lime, and received in a flask containing a large quantity of copper turnings, which have been previously calcined to remove organic matters, and then reduced by heating in a current of hydrogen.

The lime from which the sulphide has been distilled is deeply coloured, and resembles crude soda ash in appearance. The sulphide of carbon thus purified has an ethereal odour, which, if not actually agreeable, is quite different from the offensive smell of commercial sulphide. It is with sulphide of carbon thus purified that MM. Millon and Commaille have separated the perfume of the most delicate flowers, and from cows' milk have been able to recognize the odours of plants eaten by the animals.

A New Test for Hydrocyanic Acid in Vapour.

M. Schönbein has given to the French Academy of Medicine a description of a new and extremely delicate reagent for the detection of hydrocyanic acid in the state of vapour. It consists of paper imbued with resin of guaiacum, and moistened with a solution of sulphate of copper at the moment of use. In contact with hydrocyanic acid, the prepared paper immediately assumes a blue colour. Three parts of resin of guaiacum are dissolved in a hundred parts of rectified spirit. White filtering-paper is steeped in this solution and dried. The paper should remain white. A solution is prepared of one part of sulphate of copper in five hundred parts of water. To employ the test, a slip of the paper is moistened with this solution of sulphate of copper, and brought in contact with hydrocyanic acid, either dissolved in water or diffused in the air, when it immediately becomes blue. The sensitiveness of the reaction is shown by the following experiments :—

A single drop of a solution of hydrocyanic acid containing 1 per cent. of real acid, is placed in a vase of 20 litres capacity. A strip of the prepared paper is suspended by a wire in the middle of the vase, which is then covered. The blue tint rapidly becomes apparent. A drop measures $\frac{1}{20}$th of a cubic centimetre, and the vase holds 20 litres, or 20,000 cubic centimetres ; consequently, the rela-

tion of the drop to the vase is 1 to 20 times 20,000, or 1 to 400,000. But the drop contains only 1 per cent. of real acid, therefore the proportion of hydrocyanic acid in the vase is 1 in 400,000 × 100, or 1 in 40,000,000. The author states that this division may be pushed even further, and that 1 in 120,000,000 of air may be detected.

The following experiment indicates the value of this test in toxicological inquiries:—A piece of fresh meat, weighing 600 grammes, was divided into two equal parts; one part was sprinkled with 20 drops of the 1-per-cent. solution of hydrocyanic acid, and then exposed to the air for twenty-four hours. At the end of this time it was placed in a vase of 25 litres capacity, and a piece of the test paper suspended over it. In two minutes the coloration of the paper commenced, and a few minutes later was complete. The other piece of meat was kept for comparison, and exposed in another vase in precisely the same manner, but no reaction was obtained. Careful experiments were made with this paper upon the vapours of other acids, but these exerted no influence. The colour developed on the paper by hydrocyanic acid remains for a long time, but diminishes as the paper dries. After several days it passes to a greenish-grey, but revives slightly on remoistening the paper.

Turpentine an Antidote to Phosphorus.

M. Vigla states that, in a certain lucifer factory, the workmen who dip the matches wear on their chest a little vessel containing essence of turpentine, which is said to preserve the operators from the evil effects of the phosphorus vapours. It is well known that the vapour of turpentine, and many other hydrocarbons completely extinguishes the phosphorescent light which phosphorus ordinarily emits when in contact with air, and apparently prevents the slow combustion from taking place. Its influence in protecting the workmen may be due to this property.

Dr. Andant relates in the 'Bulletin Général de Thérapeutique,' a curious case to show the influence of turpentine in phosphorus poisoning. A workman, sixty-three years old, wishing to commit suicide, masticated the tipped ends of a boxful of wax matches. Immediately afterwards, thinking to assist the action of the poison, he swallowed about half an ounce of essence of turpentine mixed with a pint of water. After some time, finding the poison did not act, he chewed the ends of two more boxfuls of the matches, and then lay down, as he thought, to die. He suffered from extreme thirst, some pains in the bowels, accompanied by constipation, but nothing more. He had taken the phosphorus contained on about a hundred and fifty matches, but, thanks to the turpentine, he recovered, enduring no ill effects, and with no medical treatment beyond a dose of castor-oil.

EDIBLE FUNGI.

Dr. Bull, of Hereford, to whom the first prize for Fungi was awarded on Tuesday last at South Kensington, offered, at the request of the Council, in the unfortunate absence of our great mycologist, the Rev. Mr. Berkeley, some most interesting remarks on a few of the more prominent kinds in the different collections exhibited. The subject was one, he said, that was surrounded with difficulties, owing to the vast amount of ignorance and prejudice with which it was associated. Esculents of other descriptions were sought for with avidity; but although the ground teemed with Fungus food, it was allowed to be wasted. The first species to which he specially alluded was what is aptly called the Vegetable Beefsteak (*Fistulina hepatica*), of which a very fine specimen was shown. This is said to be the best possible addition to a beefsteak, and, indeed, if properly cooked, a steak in itself. Cut in slices, stewed for half an hour, and then fried with gravy, it was said that it might easily be mistaken, if one's eyes were shut, for the animal diet after

which it is named, and to which, indeed, it has considerable resemblance. Another esculent Fungus, two of which were shown by Mr. Reeves, the chairman, is the Giant Puff-ball (*Lycoperdon giganteum*). A specimen of this, which had been sent a short time ago to Dr. Bull, measured 3 feet 6 inches in circumference, and weighed 6 lb. Sliced and fried with yolk of egg, bread crumbs, and fine herbs, the Puff-balls were excellent,—in short, as good as a French omelette. The chief thing was to use them in a young state, and certainly before decay had in any way set in; for it should be remembered, that where there is such rapid growth as there is in Funguses, decay also takes place with proportionate speed. Dr. Bull stated that all Puff-balls are wholesome when young. Even *Lycoperdon cælatum* is perfectly wholesome in a young state, but its flavour is too rank to be generally esteemed. Certainly a case was related the other day (p. 989), in which some inconvenience was experienced from eating *Scleroderma;* but, he added, the specimens eaten were old and black. Any one knowing the different Funguses would have this advantage—that between June and November, if he went into the fields, it would be unusual if he came home without some good thing in that way to eat. He did not mean to say that all Funguses were as good as the common Mushroom; but some were decidedly superior to it in flavour, as, for instance, the Parasol Agaric (*Agaricus procerus*), and the Orange-milk Agaric (*Lactarius deliciosus*). The Parasol Agaric may be cooked in any way, and yet is excellent in all. The chairman had brought the largest specimen, but not the best as regards flavour. The smaller kinds grown in upland meadows are of much finer flavour, and when young and quickly grown are more light and digestible than ordinary mushrooms. This Agaric may be readily known by its dry scaly top, loose ring, and the snake-like marks on its stem. There was, however, a species present which bore so much resemblance to this *A. procerus* that it might easily be mistaken for it, and that was *Agaricus naucinus*, which, however, has a fixed ring and white stem. Of this Dr. Bull and friends freely partook and enjoyed, thinking it was the *A. procerus*, except that it was remarked "it did not seem quite so good as usual." It, however, proved to be *A. naucinus*, of which many beautiful specimens were shown. It is a delicate Agaric, which may be cooked in all ordinary ways with a satisfactory result. There was, he said, no difficulty in determining these two kinds, both of which were very wholesome; indeed, he said that all those at all like *A. procerus* were wholesome. There was one, *A. rachodes*, of which Mrs. Hussey said, "if the Parasol Agaric is the King of Funguses, Rachodes makes an excellent Viceroy." Attention was then directed to the *Coprinus comatus*, the Maned Agaric, which may be almost called the Agaric of civilization, since it is to be met with in abundance, not only in every bye-way and waste piece of ground, but also even in cultivated places within short distances of our dwellings. It has a very delicate flavour, which is considered by some to be equal to that of any Agaric grown, and may be generally found during four or five months in the year. Of the Horse Mushroom (*Agaricus arvensis*) it was stated that it was often substituted for the common mushroom. For every plate of the true kind found in Covent Garden Market there were perhaps three of the Horse Mushroom, which was a fine-looking and very wholesome kind, and this year very abundant. Sometimes it measured as much as 18 inches in diameter, but in that condition it was only fit for ketchup. It may be cooked like the common mushroom, but requires rather longer time. By many it is thought equally delicious with the ordinary mushroom. This one, Dr. Bull said, every one liked, even if cooked in any miserable way.

The best edible Fungus grown, according to the Rev. Mr. Berkeley, said Dr. Bull, is the Fairy-ring Champignon (*Marasmius Oreades*), which comes up on every grassplot, even at the thresholds of our kitchens, and yet we won't take it in and cook it. Soyer's receipt is best for this Agaric: "Put it on toast; salt, pepper, and butter (or add a little clotted or scalded cream); put a clove on the toast, cover with a glass, and bake or broil before the fire, for twenty minutes; serve up without removing the cover." Dr. Bull added that a common kitchen basin would do as well as a glass, but was not quite so elegant, and they would find that this was the best way of cooking all Fungi. Next came under notice *Agaricus prunulus*, the dainty Orcella, or Vegetable Sweetbread, a delicate Fungus, requiring light cooking. This had been called the Kid-leather Fungus, from the smooth soft texture which it possesses.

Lastly, among the edible Fungi was named the Chanterelle (*Cantharellus cibarius*), of which a very fine specimen was shown. This, well cooked, is excellent in every way;

and, by itself, sliced and stewed, with butter, pepper, and salt, makes an excellent dish, with a mushroom flavour peculiarly its own. If anything unusual is to be done in the culinary way by a French cook, he would ask for Chanterelles, which would probably cost as many guineas as they ought to do shillings, though they are not uncommon near London.

Some fine specimens of the following were shown, connected with which useful information as respects cookery was given:—*Agaricus melleus:* "steep in vinegar and water for half an hour; peel and fry with butter, pepper, and salt, with the addition of a little Harvey sauce or a clove or two, and it will make a better dish than has been represented." *Lactarius deliciosus*, the Orange-milk Agaric, which Dr. Badham terms tender lamb's kidneys: when cooking it, "slice to one uniform size; place the pieces in a pie-dish, with a little pepper and salt, and a small bit of butter on each side of every slice; tie paper over and bake for three-quarters of an hour; serve in the same hot dish." *Gomphidius viscidus:* "those who are fond of a mucilaginous Agaric will like this when nicely cooked." *Coprinus atramentarius:* "stewed with gravy and the usual condiments, this is very good in the absence of better Agarics. Its chief use is for making ketchup." *Hydnum repandum:* "steep in hot water, and drain in a cloth; cook in the ordinary way, and there is no better."

Passing from edible to poisonous Fungi, Dr. Bull remarked that the proportion which the latter bear to the former is not greater than that of poisonous to wholesome plants. Poisonous plants were known and avoided, and it was just that knowledge which was required with regard to Fungi. Dr. Bull thought the Royal Horticultural Society had done well to encourage an exhibition of Fungi, for though figures and descriptions in books were very useful, they were not equal to the actual specimens; moreover, if the wealthy did not first begin to use them, he was sure the poor would never be induced to do so.

Among poisonous Fungi the following were those to which Dr. Bull directed attention:—*Boletus luridus*, which becomes green and subsequently blue after being cut, was first noticed. Next came one remarkable on account of its beauty, viz., *Agaricus muscarius*, of which fine examples were furnished by the chairman. This was said to be one of the most poisonous Fungi known. Dr. Badham, it was related, had sent specimens of it to some ladies to be sketched, intending shortly to call and speak to them about it; but some case of extreme urgency prevented his doing so. The ladies, thinking that what came from such an authority was sure to be good, after sketching the specimen, had it cooked, and partook of it, and when Dr. Badham subsequently visited them he found them suffering from intoxication, the usual result of eating this Fungus. This Agaric is, indeed, employed in Russia for the purpose of inducing intoxication. In connection with this circumstance, Dr. Bull took occasion to mention that a Parisian medical man undertook to eat any Fungi that might be brought to him, whether poisonous or not, the only precaution taken being to thoroughly steep them in vinegar and water before they were cooked. Other poisonous kinds named were *Agaricus fascicularis*, a not uncommon kind; *A. sulphureus*, a rarity, with a handsome yellow top, and possessing a strong sulphury scent; *A. squamosus*, a handsome kind, of which he had seen as many as 75 in a cluster; *Cyathus vernicosus*, *C. striatus*, and *Sphærobolus stellatus*. Amongst brightly-coloured sorts, in addition to those already mentioned, attention was directed to the scarlet Peziza, and *Russula rubra; Bulgaria inquinans*, growing like little black buttons on the bark of a Cherry-tree, was also brought under the notice of the meeting.

Mr. W. G. Smith, 12, North Grove, Mildmay Park, to whom the second prize for a collection of Fungi was awarded, gave the following account of the seeds or spores of Fungi:—He stated that nearly all Fungi with white spores or seeds were edible, and that as regards form such spores were for the most part roundish or oval, whilst spores of poisonons Fungi generally took angular shapes, and one, of which he made a drawing, had them covered with spines. The colour of the spores of Fungi, he said, was mostly the same as that of the gills, and he added that all pink spores were angular, and that they belonged to poisonous species.—*The Gardeners' Chronicle, October* 10, 1868.

NOTES ON THE CULTURE OF AND COMMERCE IN OPIUM IN ASIA MINOR.

BY E. R. HEFFLER, OF SMYRNA.

The difficulties that surround agriculturists in this country are great and numerous, arising principally from the scarcity of labourers, want of capital, roads, etc.; and so heavily do they press, that, were it not for the advantage of a fine soil and climate, very little cultivation indeed could exist. The agricultural implements are of the most primitive description, and an idea of them can be formed by the fact that the plough does not go deeper into the soil than, say, four inches; another proof of the superiority of both climate and soil is, that all the crops are produced without irrigation. In the case, however, of the opium grower, there are other difficulties besides entirely beyond his control, viz. the very sensitive nature of the poppy plant and particularly perilous condition of the crop when about being collected, which render its cultivation by far the most hazardous.

The poppy, unlike other plants, is generally sown at three different times in one season. For instance, the grower who intends sowing three acres of land, will do so one at a time, and will begin with one acre about the middle of November or so, after the first winter rains; a second acre he will sow in December, and a third or last between February and March. The first sowing is called *Giuzmaly*, the second *Kishmaly*, and the third *Yazmaly*. Two are the reasons for this practice, both of which are of paramount importance. First, by this arrangement the chance of a total failure of the crops is obviated, and, secondly, as it makes a difference of about a fortnight between the time the first and last sowings arrive at maturity, it economizes labourers, as in fact there would not be sufficient hands to gather half the quantity, if this system were not in a great measure pursued; as it is, when the crops succeed well, fully one-fourth of them is lost for want of hands.

A moist soil is indispensable to the success of the plant; too much moisture, on the other hand, is injurious; it therefore follows that with a wet winter it grows best on hilly grounds, and with a dry winter in low plains.

Owing to the difference of climate between the upper and lower country, in the former, which is the coldest, the first crops are gathered in July, and in the latter in May; just about the time the plant is maturing, should it happen to shower, a very great increase of the crop is obtained.

The capsule of the poppy, better known under the name of poppy-head, is that part of the plant whence the opium is extracted. It is considered to have arrived at maturity when it has changed to a lighter green hue, and the extraction is then effected in the following manner:—

An incision is made with a knife across the poppy-head, half round, horizontally, and sometimes horizontally and vertically too; this is generally done in an afternoon, and by the next morning it is found to be covered with milk or juice, that during the night has oozed from it, which the gatherer scrapes with his knife, transferring it from the latter to a leaf of the poppy he holds in his left hand. At every alternate scraping the knife is wetted with saliva by drawing it through the mouth to prevent the juice from adhering to it.

Great precision is required in making the incison. Should it be too deep, and the interior coating containing the seed be also cut, the opium is lost, as the juice would then run into the poppy-head; and again, if the incision is not deep enough, all the juice would not ooze out.

The repugnant practice of using saliva, and which is not always limited to the wetting of the knife, has been remonstrated upon, and water suggested as its substitute; but as this would entail more trouble and perhaps loss of time, they pretend that, unless saliva is used, the opium would turn or ferment.

As soon as a sufficient quantity of the juice or opium is collected to form a ball, it is wrapped in poppy leaves, and put to dry in the shade for a short time only. There is no given size for cakes of opium, and they vary very much, being from a few ounces to two or more pounds, but in some villages they are made, on an average, larger than in others.

Short as is the time between making the incision and collecting the opium, it is still the most precarious one of all, for either a shower, by no means an unusual thing at

that time of the year, a heavy dew, or a strong wind would suffice to destroy the crop of all those fields that the day previous had been prepared for collecting.

As a rule, every poppy-head is only cut once, but as each plant produces several heads which do not arrive together at maturity, the operation of the incision and gathering of the juice is generally gone over twice or thrice, in the same field, when the opportunity is taken of recutting such heads as exceed the usual size.

Amongst the peculiarities of the poppy there is this, that its yield does not entirely depend upon its condition, the amount of dew falling the night after the incision is made having the greatest influence on both quantity and quality. The heavier it is, as long as it is not so heavy as to wash away the milk, the greater the yield, but in proportion to this increase is also the weakness or inferiority of the production; this accounts for the greater proportion of inferior opium usually found in large crops.

The opium-grower is generally a small land proprietor, who cultivates as much as his own family circle can attend to; nor would it be possible for large landholders to grow this article on a large scale, owing to the want of hands; but even supposing that labourers could be obtained, such would be the necessary expenditure for the same, that it is very questionable whether it would pay.

From the grower the opium passes into the hands of the merchants of the interior, who, after collecting it together, pack it in grey calico bags, which they seal and place in a wicker basket of oblong shape; a very light weed is strewed between the cakes, to prevent them from sticking together, and in this condition it is brought down to Smyrna. And here it must be mentioned that, while Smyrna is the market proper for all the opium grown in Asia Minor, nevertheless a very small quantity finds its way to the Constantinople market direct. The opium remains in the baskets undisturbed till sold, and it is only on reaching the buyer's warehouse that the seals are broken, and that the cakes are for the first time exposed. This takes place before buyer, seller, and public examiner, the last mentioned of whom then goes through the process of examining it piece by piece, and should either buyer or seller entertain a different opinion than his respecting any of the pieces, they are put aside and carefully re-examined at the end.

There are three qualities of opium, viz. the prime,* the current, and the inferior opium, or Chikintee; a fourth quality might be said to exist, if we take to account the adulterated cakes, which are either entirely false, or a mixture of opium with sand, gums, eggs, etc., in fact anything considered least liable to detection. The prime consists either in the extra examination of the baskets, or what is more generally the case, in the opium grown at certain districts. The current is the mercantile or bulk of the crop, and the Chikintee is that rejected from both the prime and current qualities. Quality, however, is generally understood by the name of the place the article is grown at, and, admitting that some places, on the whole, produce superior opium to others, how far this may be correct in the case of a particular purchase is too obvious to require any comment. Besides, if place was a reliable guide as to quality, we come to the question, how is that of one place to be distinguished from that of another; of this we have a good illustration. The sales effected at the end of the season, as opium coming from the renowned districts, often amount to three and four times the quantity those districts can possibly produce; this anomaly is only a proof as to the capacity of other places of producing a quality equal to that of the famed ones.

Commercially speaking, there is no rule by which one can become a judge of opium, of however moderate aspirations; this ability can only be acquired through many years' practice. In examining this article the use of nearly all the faculties is required: colour, appearance, weight, scent, etc., serve as a guide, for often a dark-coloured cake is as good as a light one, or both may be bad; one scent as good as another; soft or hard, etc. etc., may both be good or bad. To be a judge of opium, therefore, one must be guided by a combination of circumstances, so variable in themselves that, as before mentioned, it can only be acquired by great experience. Such being the case, it may easily be imagined what people think here of the system pursued in some markets, where it is mostly judged by its external appearance.

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* Known in this market under the name of *Yerly*, which word means "of this place," viz. that grown round about Smyrna, implying thereby that only this, and the whole of it, is prime; so far from this being correct, there are in the vicinity of Smyrna some places producing very bad opium, while in some of the furthest districts the quality is first-rate.

The first baskets of opium arrive in Smyrna about the end of May or beginning June, but for several reasons it is not safe to effect any shipments before the month of August. First, too fresh opium is liable to get heated; secondly, the Chikintee is not so easily detected; and thirdly, it gives a loss in weight.

Apart from agricultural causes, the crop of opium, like that of all other productions, depends in a great measure on the ruling prices at the close of the season, which influences its greater or lesser sowing, so that after a large crop, with low prices, a small crop, and of course high prices, are almost sure to follow, and *vice versâ*. As a guide to the probable ruling prices of a season, the extent of the crop is, of course, a very good criterion; to ascertain this, however, with any degree of accuracy, the greatest difficulty is encountered. First of all, the merchants-stockholders, who know well the influence of quantity on price, are always ready to misguide one, and secondly, no account can be obtained from the Government tax gatherer, as the tithes are usually sold by auction; it is only by dint of great exertions and experience that anything like the truth can be ascertained.

The best time for effecting purchases, as a rule, is at the commencement of a season; with a small crop, however, the chances are often most in favour to the buyer at the end of a season, for, according to the remark that after a small crop comes a large one, prices are generally affected towards the close by the coming crop.

From a record published by the writer, some months ago, respecting the crops and shipments of opium for the last ten years, viz. from July, 1857, to June, 1867, the following items may be deducted:—

Average Crops.

1857–58.	3026 cases.	Average price		16·28*
1859–60.	3013	„	„	„ 18·58
1860–61.	3381	„	„	„ 17·29
1863–64.	2866	„	„	„ 17·88

3000 cases at 17*s.* 6*d.* being the average quantity and price for the above four years.

Short Crops.

1858–59.	1439 cases.	Average price		19·76
1862–63.	2236	„	„	„ 18·01
1866–67.	2246	„	„	„ 16·92

2000 cases at 18*s.* being the average quantity and price for above three years.

Large Crops.

1861–62.	4180 cases.	Average price		14·39
1864–65.	3893	„	„	„ 15·20
1865–66.	4135	„	„	„ 13·83

4000 cases, at 14*s.* 6*d.*, being the average quantity and price for the above three years.

The total for the ten years is 30,415 cases, or an average of 3000 cases per year, at 16·39, say 16*s.* 4½*d.*

The months of June represent the smallest shipments, viz. 1326 cases, or an average of 132 cases per month.

The months of October the largest, viz. 4979 cases, or an average of 497 cases per month.

Before the epoch at which the writer's record begins, a fair crop consisted of only 2000 baskets, and the average price was about 11*s.* 6*d.* The established progress of this article in so short a time is without parallel, the crops having nearly doubled themselves, and prices risen to fully 50 per cent. It would have been natural to suppose that, with such an increased production, prices would have lowered in proportion, which no doubt would have been the case, if demand had not also kept pace. This, to-day, cannot be properly satisfied under a supply of say 3500 baskets, beyond which only prices give way. It must not, however, be supposed that they can possibly go lower than the average of a full crop, for then it would not pay the agriculturist to cultivate this article,

* These prices are calculated in shillings, and hundredths of shillings, per English pound, free on board.

and would cause him to turn his attention to other and more profitable productions; this would naturally have the effect of diminishing considerably the ensuing crop and raising its price. It is only in the furthest districts from Smyrna that the grower is obliged, as it were, to cling to opium; for the expense of transit prevents the exportation of all other articles, which, remaining for local consumption, command only a low price. But as opium alone, on account of its small bulk in comparison to value, can bear the forwarding charges, it is almost, under any circumstances, the best paying article for the said districts.

The fact must not be overlooked, that the demand is still slowly but steadily increasing, and that, on the other hand, the productive capacities of the opium districts are at their climax. When, therefore, prices are under or about a corresponding crop out of the last ten years, the opportunity should not be missed.

With reference to the average price of some twelve to fifteen years ago, it must be observed that the necessaries of life were at that time so much cheaper, that the then 11*s.* 6*d.* was perhaps more remunerative than the 16*s.* 6*d.* of the last ten years.

[NOTE.—This paper was published in Smyrna (Asia Minor), in April, 1868, in pamphlet form, by the author, who, in prefatory notes, states that it was given at the request of several friends, and is based on his personal knowledge.]—*American Journal of Pharmacy.*

EXPERIMENTS WITH PAPER FILTERS.

The filter most commonly employed in analytical laboratories is a circular piece of paper folded twice upon itself into the form of a quadrant, and supported on a glass funnel with straight sides. This filter, though commendable in so far as it is capable of supporting the weight of a considerable column of liquid without breaking, is objectionable, inasmuch as liquids cannot pass through it so rapidly as is desirable. Since at almost every point the paper is in close contact with the glass, but little of the liquid can flow off between the filter and the sides of the funnel.

Several schemes have at various times been proposed for opening waterways between the glass and the paper; the interposition of straws, glass-rods, and splinters of wood between filter and funnel, as well as fluted funnels and plaited filters—are all devices looking to this end.

The advantages of the plaited filter are so great that some chemists prefer to use it, even in quantitative analysis, instead of the common form, in spite of its greater liability to break, and the difficulty of washing the precipitate.

In the laboratories of Professors Lawrence, Smith, and Ordway, among the most accurate of American analysts, plaited filters are said to be employed to the almost total exclusion of the plain form.

Another excellent method of increasing the speed of filtration, first suggested in this country by the German chemist, Fleitmann, consists in placing one plain filter within another of coarser fibre; for instance, a fine plain filter of Swedish paper may be placed within another plain filter of coarse German paper, supported, as usual, on a funnel.

In experimenting upon these various forms of filters, it occurred to me to fold the plain qualitative filter in two operations instead of one. In place of folding the filter doubled upon itself down the middle in the usual way, I proposed to turn down on each side of the paper a fold equal to one-quarter of the semicircle, and then to fold the sectors of 45° arc thus formed back upon themselves.

The filter is then opened without disturbing the folded portions, and placed upon the funnel. In this form the triple side of the plain filter is broken up, and the folded portions keep open passages, instead of hindering filtration.

This filter, as tried against the plain form, gave, 1st, 133 : 100. 2nd, 111 + : 100. 3rd, 205 + : 100.

Two plain filters ran equally in several trials; each was changed into the other's funnel, and No. 1 ran 33 per cent. less than No. 2. No. 1 was dried and folded into my form; remaining in the same funnel, it ran 32 per cent. faster than the other. Both filters were then opened, and showed no tear or weakness when held against the light.

As these filters gave different results in different funnels, I thought I would ascertain the cause. The water seemed to be retarded in its passage by the attraction of the

glass; therefore, those funnels having the greater portion of the paper free from the glass would be the best; that is, *a broad-throated funnel, other things being equal, will filter faster than a narrow-throated funnel.*

To test this point I selected two *large* funnels; No. 1 had three times as broad a throat as No. 2. With the first filters they ran:—

117 : 100 123 : 100 133 : 100 118 : 100.

The reason for this low difference was found in a thin spot near the point of No. 2.

Other sets of filters gave:—

2nd set,	292 : 100	318 : 100	
3rd set,	288 : 100	335 : 100	
4th set,	300 : 100	burst.	
5th set,	384 : 100	407 : 100	482 : 100
6th set,	242 : 100		

In the last set a porous filter, though off the same sheet as No. 1, was given to No. 2. Throughout the whole series of experiments every fair advantage was given to the weaker party, it being the first filled and the last emptied.

To make assurance doubly sure, I tried filters in like funnels, stopping the pores of the paper at various points. Paraffin applied whilst liquid was the substance first used to prevent filtration.

Two filters were chosen from the same sheet and of as uniform a texture as possible. No. 1 was stopped over one-third the radius from the point. No. 2, all but one-third the radius at the point.

They filtered at nearly the same rate, No. 1 slightly the faster. The paraffin made the paper stiff, and as water does not adhere to it, free passage was allowed between it and the funnel to the water of the upper part of No. 2.

Here we see that one-ninth of the surface of the filter, when free, did as much work as eight-ninths adherent to the glass. The experiment was repeated with glycerin instead of paraffin. No. 1 ran 28 per cent. the faster. It might be objected that glycerin would wash out; so a pap of paraffin and spirits of turpentine was used to repeat the experiments. Each filter, after being painted, was wetted to prevent the spread of the mixture by capillary action. The trials were not sufficiently numerous to find a true mean, but the free point invariably ran the most—from 4 or 5 per cent. excess to 100 per cent. The point was assumed to be a circle one-third the radius of the filter.

I understood the idea of the Fleitmann filter to be this, that, likening a plain filter to a peat-bed resting upon an impermeable subsoil, it might be compared to a porous substratum interpolated between the swamp and the clay bottom.

To test this idea, a Fleitmann filter was made and wetted, carefully patting down and smoothing out any irregularities. It was tried against a plain filter which was placed in a funnel with but two-thirds as wide a throat as that of the Fleitmann. It ran 114 : 100; that is, the passages kept open by the elasticity of the paper, the creases and abutting edges liken this filter to tile drainage.

To increase the size and number of passages I tried putting the inner filter into a plaited filter of coarse paper. Changing the filters after each trial, I found this form gave the following results as compared with the plain filter, calling the latter one hundred:—

1st trial,	184 : 100	4th trial,	66 : 100
2nd „	201 : 100	5th „	170 : 100
3rd „	250 : 100		

I afterwards found a thin spot in the plain filter of the fourth trial.

Next a precipitate of sulphate of calcium was tried; the filtrates were as 131 : 100. On weighing the precipitates collected they were as 200 : 100.

This form of filter was abandoned, since it does not filter as fast, is not as strong, takes more time to make and care to use than the form next to be described. It is, however, better than the plain filter as regards speed of filtration, equal to the plaited in this respect and stronger than it.

To admit the use of very broad-throated funnels, the number of outside filters was

increased to two; these overcoats were pierced with long, narrow apertures, running from the point to the circumference.

In the following experiments, the improved filter was tried against the *plaited* form. The improved filter, on account of its great strength, was allowed a funnel with a throat once and a half as broad as that given to the plaited filter. It would have borne one three times as broad.

1st trial,	121 : 100	3rd trial,	112 : 100
2nd „	125 : 100	4th „	115 : 100

The fifth trial was made with a precipitate of sulphate of calcium; the filtrates were 82 : 100. Here the new filter seemed at fault, but on weighing the precipitates collected, they were as 140 : 100. The new filter being last filled, got the thicker portions each time, while the plaited filter got the weak top liquor.

The outer jacket is cut by folding the filter as a plain filter and taking out a sliver on each edge; repeating the process increases the number of apertures. If the filters are to be used double, as in broad-throated funnels, the openings should extend nearly to the vertex; if they are used single in common funnels the openings need not extend so far, and the extreme point may be removed.

A thick porous felt might be used for acid liquors as an outer filter. Cotton cloth would serve in alkaline solutions; gun cotton could be used with either. If asbestos cloth could be procured, it would probably be the best. It might be cleansed by burning, and would be unaffected by anything likely to be filtered in quantitative analysis, nor would it harm the filtrate when estimations are to be made by permanganate of potassium.

Most coarse filter-paper is "stuffed" with mineral matter; such paper must, of course, be leached in acidulated water before being used for quantitative work, where the filtrate is to be saved.

When the precipitate is dry, the outer filters are thrown away, only the fine inner filter being burned.

Plaited and plain filters were tried in like funnels; calling the plaited filters No. 1, we had:—

	I. II.		I. II.
1st trial,	116 : 100	3rd trial,	236 : 100
2nd „	237 : 100	4th „	136 : 100
5th „	with sulphate of calcium precipitate,		231 : 100

The precipitates weighed 166 : 100.

I then tried plain filters off the same sheet against each other in like funnels; usually the results varied but a few per cent., though sometimes much more; the greatest difference noticed was 2 to 1; several times the results corresponded exactly on repeated runs of 500 cubic centimetres.

Experiments were made to determine the difference in efficiency between the single and the triple sides of filters. No. 1 had its triple side covered with paraffin, leaving the single side free. No. 2 had the triple side free, while the single was covered; with paraffin the result was 175 : 100; glycerin was then tried with the result 200 : 100, showing the additional paper considerably retarded the flow.

I thought, since the adhesion of the water to the glass is the cause of slow filtration, I might increase the flow by coating the funnels on the inside with paraffin, to which water does not adhere. No. 1, being coated, No. 2, left clean, I got

	I. II.		I. II.
1st trial,	200 : 100	3rd trial,	100 : 100
2nd „	184 : 100	4th „	137 : 100

The filters in the third and fourth trials were the same, but the funnels were changed about.

The outside or skeleton filters, above described, may be cut the same size as the inner filter; if much smaller the upper part of the inner filter clings to the glass; if larger, a part of the precipitate is liable to adhere to the outer filter, and even with great care a part of the precipitate would creep up and be lost.—*Abstracted from an article by Charles E. Avery, in the 'American Journal of Pharmacy.'*

ETHERIZED COD-LIVER OIL.

In a paper recently published in the 'British Medical Journal,' by Dr. Balthazar A. Foster, there are certain results of his investigation and observation stated, on the advantage of combining ether with cod-liver oil, which, although in the main, for the consideration of the physician, may not be uninteresting, nor perhaps unimportant, to the pharmaceutist. Taking it as an established fact, that the difficulty of assimilating fat is a constant characteristic of the dyspepsia of phthisis, and further, that a marked improvement in such patients is observed when the ability to digest fatty matter is restored, Dr. Foster has set himself to work to determine the best means of "*augmenting the secretions which are specially devoted to the digestion of fatty matters*," and has determined to his own satisfaction that, "*ether not only obtains for us the secretions required to digest fats, but promotes the absorption of these fats when digested.*" In some cases the ether has been given in water alone before the oil; but the favourite method seems to be to combine the two, in the proportion of from ten to twenty minims of ether purus, P.B., to two drachms of oil. One advantage of the combination seems to be the power of the former to mask the unpleasant properties of the latter. Dr. Foster recites many cases to prove that where cod-liver oil by itself had failed to produce improvement and to arrest the wasting, the addition of ether has been eminently successful in allaying nausea, and producing a decided increase in the weight of the patient.

OZONIC ETHER.

The substance called ozonic ether, and which is now creating so much interest in the profession, is peroxide of hydrogen in ether. The mixture thus formed was first made by myself; I was testing the action of the peroxide of hydrogen on various substances, organic and inorganic, and having one day added a strong solution of the peroxide to some ether, I was surprised to find that a portion of the peroxide seemed to pass to the ether, the ether, when decanted off, having a very strong taste of peroxide, and yielding oxygen freely when treated with oxide of manganese. On being kept, the ether was discovered to undergo further change, the oxygen becoming more stable and fixed. The addition of a little alcohol to the ether facilitates the absorption of the peroxide. The combination of the oxygen with the ether and some water, although it is very slight, is persistent, for the mixture has been sent to Australia without deterioration. The compound is, without doubt, a useful agent. I think I may claim it as an addition to our list of remedies likely to hold its place.

I used it in the first instance for diffusion in the air of the sick-room, dispersing it in the form of spray. It is quick in action, and effective for purifying the air; it does not charge the air with moisture, and it does not irritate the breathing organs. The disadvantage of it is that it cannot be safely used near a light or fire. It should be sprayed through a glass tube.—*Dr. Richardson, in 'Medical Times and Gazette.'*

HAIR AND HAIR DYES.

The attention which we called, some time since, to the new and perfect black hair dye which Dr. M'Call Anderson lately incidentally hit upon, produced a long series of commentaries from accomplished dermatologists and others, well qualified to speak on the not uninteresting subject. Mr. Erasmus Wilson, a leader amongst the professors of dermatology, now enters upon, and discusses the whole question in a series of very interesting observations in the 'Journal of Cutaneous Medicine.' He observes, that the hair owes its property of dyeing to its porosity; which is evidently greater than its physiological structure would lead us to infer. Another of its properties, namely, the presence of sulphur in its constitution, renders it prone to darken under the use of certain mineral substances; for example, lead and mercury, whose compounds with sulphur are black. Thus if a weak solution of lead or mercury be brushed into the hair, a certain quantity of the solution will penetrate the hair, and a dark colour will be produced in consequence of the formation of a sulphuret of lead or sulphuret of mercury. The depth

of the shade of colour will depend upon the quantity of sulphur present in the hair, and as red hair and light-coloured hair contain more sulphur than dark hair, the result will in that case be comparatively greater. But where the amount of sulphur is too minute to produce the dye, science suggests the means of introducing more sulphur, as is illustrated, by a reversal of the process, in the following quotation from a paper by Dr. M'Call Anderson on *Eczema marginatum*:—"During the treatment I accidentally discovered what promises to be the most perfect black dye for the hair which has been seen. After having used the bichloride lotion for some weeks, I changed it for the lotion of hyposulphite of soda; and the morning after the first application, the hair of the part which before was bright red, had become nearly black. One or two more applications rendered it jet-black, while neither the skin nor the clothing was stained. I saw this patient a couple of weeks later, and there was not the least deterioration of colour; although, of course, as the hair grows the new portions will possess the normal tint." The reason of the escape of the epidermis, while the hair was so thoroughly dyed, is that it contains no sulphur. Mr. Balmanno Squire, in a commentary on the above process, observes that if instead of the hyposulphite of soda one of the more common mordants be employed—say, for example, the sulphide of ammonium, "instead of a black, a bright red colour will result. The *modus operandi* of Dr. Anderson's dye is this. The hyposulphurous acid, on being liberated from the soda, decomposes into sulphurous acid and sulphur. The sulphurous acid reduces the bichloride of mercury to the chloride, and the sulphur converts the chloride into (black) sulphide. The effect of the sulphide of ammonium on bichloride of mercury is to produce the (red) bisulphide which is the common vermilion of commerce." Another commentator on "hair dyes" observes that, with the barbers the "sheet-anchor appears to be lead and lime." And again it is recommended to "first wash the hair with a solution (ten grains to the ounce) of nitrate of silver; then use a weak solution of pyrogallic acid, and wash." An interesting article on the subject, from the pen of an able chemical writer, Dr. Scoffern, may be found in the May number of 'Belgravia,' under the head of "Cosmetics for the Hair." Dr. Scoffern reminds us that the Persians employ indigo to procure a blue-black dye, and the Turks and Egyptians a "pasty writing-ink," composed of pyrogallic acid in combination with a native ore of iron, while in the West the chief constituents of hair-dyes are metallic bodies and walnut-juice. The metals chiefly in use as "capillary chromatics" are silver, lead, and arsenic; while others applicable to a similar purpose are gold, bismuth, iron, copper, cadmium, titanium, uranium, and molybdenum. Lead, in its crudest form, is represented by the leaden comb; but as the process by this means is slow, a compound of oxide of lead or litharge, with lime, and made into a paste with water, is more commonly employed. This is smeared on the hair at night, the evolved gases being imprisoned by an oilsilk cap, and in the morning the dried paste is brushed out, and the hair refreshed with pomatum. Or, if a so-called brown, a "smothered" or "fusty black" be required, the paste should be mixed with milk instead of water. The night is preferable for these remedies, because the hair is supposed to exhale more sulphur at this period than during the day. These preparations remind us of a lotion in common use at the present time, consisting of a drachm of acetate of lead with twice the quantity of sulphur to half a pint of water. The nitrate of silver is another common form of dye, but is open to the objection of staining the skin, and, in fact, everything it touches, and also of becoming iridescent on exposure to light, producing, as Dr. Scoffern observes, a "chromatic play of tints," which is very undesirable. Bismuth presents the same characteristics as lead, but is not much used; and when iron is employed to produce a black tint, it requires for its mordants either the pyrogallic acid or the hydrosulphate of ammonia. Brown is produced by the chloride of gold alone, as also by a solution of sulphate of copper with a mordant of the prussiate of potash (ferrocyanide of potassium); and titanium, uranium, and molybdenum, judged by their chemical behaviour, would give rise to similar results. The "golden-yellow colour," so much in fashion of late, is produced by a solution of arsenic with a mordant of the hydrosulphate of ammonia. And cadmium would probably give rise to a similar result. In the case of dyeing the lighter tints, however, it becomes necessary to submit the hair to a process of bleaching, which is commonly effected by a solution of one or other of the alkalies, by chlorine, by the chloride of soda or lime, or by sulphurous acid, bisulphate of magnesia or lime, or peroxide of hydrogen. In general, the dyes requiring mordants do not stain the epidermis.—*The British Medical Journal.*

HALF-YEARLY REPORT OF THE CHEMISTS' ASSISTANTS' ASSOCIATION,

14, Air Street, Regent Street, W.

The Committee have the pleasure of reporting the continued progress of the Association. During the past half-year the following subjects have been introduced for discussion:—"Granulation," Mr. Bletsoe; "Manufacture of Earthenware," Mr. Porter; "Subjects to be studied in Pharmacy," Mr. Mathews; "The Steam Engine," Mr. Shann; "Mem. on Nitrous Oxide," Mr. Porter; "Solanaceæ and Atropaceæ," Mr. Cottrill; "Milk," Mr. Stiles; "Prescriptions," Mr. Beynon; "England's Progress," Mr. Wilby; "Copper from Sulphide of Copper and Iron," Mr. Porter; "Flowers," Mr. Benyon; "Amended Pharmacy Act," Mr. Willmott; "Ammonium and its Salts," Mr. Stiles; "Petroleum," Mr. Sands; "Suppositories," Mr. Taubman; "Wines," Mr. Hunt; "Common Salt," Mr. Cottrill; "Dispensing," Mr. Haddock; "Philosophy of the Ocean," Mr. Trask; "Human Hair," Mr. Smith. The manner in which these subjects have been treated reflects great credit on their authors, and the ensuing discussions show an increased scientific knowledge amongst the members.

The Committee report on the improved financial position of the Association, full details of which will be laid before the members.

The Committee report with regret the resignation of the President before the expiration of his term of office; but they have his assurance that he will still retain a lively interest in the prosperity of the Association.

During the last session, the Pharmacy Act has been amended, and the Committee trust its working will be found beneficial to the interest of the trade generally.

It is gratifying to the Committee to know that various Provincial Societies have been established on the model of this Association, and their success is most encouraging.

The Association has now been established five years, and the Committee whose term of office expires this evening, would earnestly impress upon the members of the Association the great importance of regular attendance at its meetings to ensure its continued progress.

T. H. Hall, *Chairman.*
J. T. Porter, *Hon. Sec.*

December 3rd, 1868.

BIRMINGHAM CHEMISTS' ASSISTANTS' ASSOCIATION.

The Assistants of this town, in forming a trade association, have succeeded in accomplishing that which has more than once baffled their employers.

The society, which has now been eleven months in existence, held its Second General Meeting, December 2nd, at the Globe Hotel, Bull Street; the President, Mr. Churchill, in the chair.

It was reported that about forty members were on the books, and a balance of £2. 10*s.* 6*d.* in hand.

The Materia Medica class, under the able superintendence of the President, was reported as numbering twenty-one members, and as progressing favourably.

Mr. Churchill, President, and Mr. Turton, Vice-President, were unanimously re-elected. The Committee of Management was elected, consisting of Messrs. Churchill, Turton, Mucklow, Jones, Bliss, Sharples, and Swinn. Mr. Mucklow was then requested to continue his services as Secretary and Treasurer. Several members of the Association were reported to have recently passed the Minor Examination of the Pharmaceutical Society.

The President, in a few remarks, dwelt upon the satisfactory state of the Association, as shown by the books; and also on the hard work, research, and ability that had been displayed by the members who had contributed papers during the session.

ROYAL COLLEGE OF SURGEONS, EDINBURGH

At a meeting of the College, held recently, there was read an opinion by Mr. A. R. Clark, advocate, in regard to the operation of the Pharmacy Act, of which the following is an excerpt:—"I am of opinion that the memorialists and their licentiates are legally qualified Apothecaries within the meaning of the Pharmacy Act, and that they are entitled to keep open shop and to dispense medicines. The Pharmacy Act is not of universal application. By the sixteenth section it is enacted that it shall not extend to, or interfere with, the business of any 'legally qualified apothecary.' The question, therefore, is, whether the memorialists and their licentiates are within the exception. They hold a diploma which authorizes them not only to practise as surgeons, but also to 'exercise the office of a pharmaceutist.'"

THE NEW PHARMACY ACT.

A numerously attended meeting of the Chemists and Druggists and Pharmacists of the town was held in St. George's Hall, Bradford, on Tuesday night, Dec. 22nd, to take into consideration the position of the trade in relation to the Pharmacy Bill passed last session, which will come into operation on the 1st January. Mr. F. M. Rimmington was requested to take the chair, and the following resolution was unanimously agreed to:—"As the Legislature has imposed great restrictions and onerous responsibilities upon those following the business of chemists and druggists, this meeting is of opinion that it is desirable the members of the trade form an association for the purpose of acting with greater unity; for discussing such matters as may arise affecting the interests of the body, and for promoting the study of such branches of science as are requisite for assistants and apprentices, to enable them to pass the necessary examinations of the Pharmaceutical Society." A committee was appointed to consider the best means of carrying out this resolution, and another meeting will be held to receive the report.—*Bradford Observer*, Dec. 24.

THE PHARMACY ACT AND THE RIGHTS OF MEDICAL PRACTITIONERS.

We recently referred to the resolution taken at the last meeting of the Executive Committee of the General Medical Council to take the opinion of counsel as to the probable interference of the provisions of the Pharmacy Act, and especially Clauses 1, 16, and 23, with the rights of registered medical practitioners under the Medical Act, to dispense or sell drugs used in the practice of medicine. We understand that the opinion of counsel, which has been received and circulated for the information of the members of the Executive Committee, affirms the rights of practitioners under the Medical Act, which protects those registered under it from any interference on this score. The opinion of the Hon. George Denman has been taken by Mr. Ouvry, upon a case elaborately stated, and he asserts decidedly that the rights of registered practitioners to dispense and sell medicines are in no way affected by the Pharmacy Act. We had already, some weeks since, received and promulgated the like opinion from a sound legal authority, in reply to a correspondent.—*British Medical Journal.*

ACCIDENTAL POISONING BY OPIUM.

Mr. Emsley, the borough coroner of Leeds, held an inquiry respecting the death of Elizabeth Scurrah, aged four weeks. It transpired that on Thursday evening the mother, the child being unwell, had given it a dose of paregoric, which she had obtained previously at Mr. Aldridge's, druggist, North Street, for a child four years old. After taking the medicine the child became so ill that Mr. Seaton, surgeon, was sent for. That gentleman discovered that the child was suffering from the effects of opium, the essential ingredient of paregoric. Mr. Seaton's efforts to save the child's life were unavailing. In reply to the coroner, Mr. Seaton stated that it was dangerous to administer

such medicines to children of such tender ages. It was, however, very common, and it was surprising that more fatal cases did not occur. The jury, in returning their verdict, did not attribute the slightest blame to Mr. Aldridge, as he had sold the medicine under the belief that it was for a child of mature years. They also acquitted the mother of any blame, their verdict being to the effect that she had administered the medicine in entire ignorance of the fearful consequences that followed. They appended to their verdict a hope that mothers would be careful in administering medicine to their children, and advised that when there was apparent danger, a medical man should be consulted. During the inquiry it was stated that the new law regulating the sale of poisons would be in force at the beginning of next year, and its provisions were said to be of such a nature that a great benefit to the community would be the result.

REVIEWS.

Histoire Naturelle des Drogues Simples, ou Cours d'Histoire Naturelle Professé à l'École de Pharmacie de Paris. Par N. J. B. G. Guibourt, Professeur à l'École supérieure de Pharmacie de Paris, Membre de l'Académie de Médecine. Ouvrage couronné par l'Institut (Académie des Sciences). Sixième édition, corrigée et augmentée, par G. Planchon, Docteur en Médecine et Docteur ès Sciences, Professeur à l'École supérieure de Pharmacie de Paris. Avec plus de 900 figures intercalées dans le texte. Paris: J. B. Baillière et fils. 1860. 8vo. Tome I. et II.

When the late Professor Guibourt retired from the active duties of the Paris School of Pharmacy in the year 1866, it was his intention to prepare a new edition of the useful and excellent work with which his name is so intimately associated; but the project was frustrated by his death at the age of 77 in the following year. A copy enriched with his own annotations remained, and his unrivalled collection was happily not dispersed:—aided by these materials, his successor Dr. Gustave Planchon has undertaken the task of placing the *Histoire des Drogues* once more before the public, with such alterations and additions as the progress of science has rendered necessary. In doing this he has thought it right to allow the book to retain the original and we may say *personal* character which distinguished it. We have often admired this feature of the work: our author tells us what he has observed and thought about this and that substance, sometimes giving the date of his earliest observations. Thus in treating the order *Lauraceæ* he remarks that about the year 1805, the period at which he commenced the study of pharmacy (being then in his fifteenth year), the bark sold in Paris as *Cassia lignea* differed from other barks of the Cinnamon group by its *complete want of smell and taste*, and he adds that when about 1812 or 1813, certain specimens designed for the grand pharmacological collection of the Pharmacie Centrale des Hôpitaux were sent for from Holland ("*afin que leur qualité fût mieux assurée*"), this same inodorous bark was supplied as *Cassia lignea*. We cite these remarks because they show the observant habits which distinguished Guibourt even when a youth, and because we once had the pleasure of handing him a specimen of this curious sort of Cassia found in the London market, which the accuracy of his description enabled us to recognize.

The first volume of the work before us is devoted to mineralogy, a subject embraced n the course of study through which a French pharmacien has to pass. The concluding 70 pages are descriptive of the principal mineral waters used in medicine.

The second volume comprises a portion of the vegetable Materia Medica, commencing with plants of the lowest organization and advancing as far as *Styracaceæ*; and here Dr. Planchon's care as Editor is conspicuous in the numerous additions of new and valuable information.

The nature of Ergot which has been so fertile a subject of speculation and research among naturalists was discussed with great interest by Guibourt, and with conclusions which approached more nearly to the truth, as afterwards elucidated by Tulasne, than those of any previous author. To Guibourt in fact is due the first figure of fructifying ergot, if we may so speak of the *Claviceps purpurea* of Tulasne, though we must admit that he regarded it rather as a parasite of the ergot than as the ultimate development of that substance. This somewhat rude woodcut has been replaced in the new edition

by a more elegant figure, side by side of which are representations of the ergots of wheat and of the Algerian *diss* (*Ampelodesmos tenax*, Link), both lately recommended in France as substitutes for Ergot of Rye.

The observations of Berg on the botanical origin of Gum Euphorbium and those of Flückiger on its chemical constitution, have not been forgotten. Doubts have long existed as to the plant affording this drug. *Euphorbia Officinarum* L., *E. Antiquorum*, L., *E. tetragona* Haw. and *E. canariensis* L. have all been named as yielding it; but the first two are plainly different from the remains of the plant which are found in the packages of the gum, and one of them is moreover indigenous to India, while the drug itself is a production of Morocco. *E. tetragona* is also native of another region to that affording Gum Euphorbium, as mother-plant of which it cannot therefore be accepted. There remains then *E. canariensis*, to which Pereira thought the gum might with very little hesitation be referred. But closer examination led Berg to a different conclusion, and induced him to claim the euphorbium-plant as a distinct species under the name of *E. resinifera*. This plant at present only known in a dry state from the remains picked out of the Gum Euphorbium of commerce, differs from *E. canariensis* in its stems of one-third the thickness, and (which is a character of far more importance) in having its flowers in stalked umbels instead of almost sessile. The recent chemical researches of Flückiger on euphorbium have proved the existence to the extent of 20 per cent., of a peculiar crystallizable substance termed *Euphorbon*, to which it owes its drastic qualities. Euphorbon has the formula $C_{26}H_{22}O_2$, is soluble in ether, amylic alcohol and chloroform, but not in water. The large proportion of malate of lime occurring in euphorbia and other fleshy plants is a curious fact, the significance of which is not yet apparent.

Besides being supplemented with much interesting fresh matter, the second volume is supplied with a considerable number of new woodcuts, some of which appear of a lower style of execution than those of the old edition. The figure of *Pogostemon Patchouli* (p. 457) which is without character, of "*Styrax-benzoin*" (p. 599) where the name seems misapplied, and of *Batatas edulis* (p. 514) where the tuber has the appearance of an immense fruit, will justify this censure. In the main however the work is still excellent, and we rejoice to think that the reputation of Guibourt is maintained by so competent and devoted a successor as Dr. Gustave Planchon.

A Dictionary of Materia Medica and Therapeutics. By Adolphe Wahltuch, M.D., L.R.C.P. Lond., Fellow of the Obstetrical Society of London, Honorary Member of the Medical Society of Prague, etc. London: John Churchill and Sons, New Burlington Street. 1868.

The purpose of this work is to give a tabular arrangement of all the drugs specified in the British Pharmacopœia of 1867. Every table is divided into six parts,—1. *The Name and Synonyms of the Drug.* 2. *Character and Properties, or Composition.* 3. *Physiological Effects and Therapeutics.* 4. *Dose and Forms of Administration.* 5. *Officinal Preparations.* 6. *Prescriptions*, being selections from the formulas of eminent practitioners in the different countries of Europe and America. In fact, everything is tabulated of importance, in reference to drugs, except in the case of those of vegetable and animal origin, where no mention is usually made of the names of the plants or animals from which they are derived, or of their geographical sources. We hope the author will make these additions when another edition is called for, as also in the new work which he contemplates issuing, should the present be well received, to contain notices of all the drugs, except those of the British Pharmacopœia, as we believe the value of both works will be thereby increased.

In a work involving much labour and research, we cannot but expect some few omissions and errors; but, upon a general perusal, we have detected none of importance. We congratulate the author on having produced a valuable work out of the beaten track, and one which cannot fail to prove a most useful book of reference to the medical practitioner and pharmacist.

A Manual of Elementary Chemistry. By George Fownes, F.R.S. Tenth edition, revised and corrected.

The great and well-sustained success which has attended the publication of a large number of editions of Fownes's Manual, and the favourable estimation in which the

work has been held for so many years after the death of the author, may in great measure be ascribed to the concise yet explicit style of its composition, and to the judicious manner in which the various topics have been brought into greater or less prominence, in accordance with the extent of their claims upon the attention of the student. The work was originally intended as a student's manual, and it is in this character that it has continued to have so large a circulation. For several years past, however, it has hardly maintained its position as an exponent of modern chemistry, and it has been necessary for students to refer to other works for explanations of many modern theories which have given a new aspect to the whole system of chemical science. The caution which has been observed in making a complete and comprehensive change from the old to the new system ought not to be complained of in a work of this description, for it would have been unwise to adopt the new views of enthusiastic investigators and theorists until they had stood the test of prolonged trial under various conditions, and received the sanction, slow but concurrent, of all classes of chemists. The time had come when it was necessary, in bringing out a manual of chemistry for the use of students, to adopt a notation and arrangement of subjects different from those used in the previous editions of this work. Mr. Watts, the well-known author of the 'Dictionary of Chemistry,' recently completed, has been associated with Dr. H. Bence Jones in preparing this edition, and certainly the work could not have fallen into better hands. That the extent of the work has been increased has resulted from the great accession of new matter which modern research has brought to light in this department of science. In its present form, Fownes's Manual may be taken to represent the science of chemistry as it is now taught by the most eminent of its professors. To give it this character, it has been necessary to rewrite and rearrange a great part of the work as it had previously existed, but the former style and leading features have very generally been maintained, and we have no doubt it will continue to support its long-sustained reputation.

The Ship Captain's Medical Guide. Compiled by Harry Leach, Resident Medical Officer Hospital Ship "Dreadnought." Second Edition. London: Simpkin, Marshall, and Co., Stationers' Hall Court. 1868.

The objects and scope of the compiler of this work are thus stated in the preface:—

"This work is written solely for the use of masters and mates of vessels at sea. It is confined strictly to a plain and brief description of accidents and diseases that occur on board ship; and much care has been taken to show as clearly as possible how these accidents and diseases can be best treated by a non-professional man. So little choice is given in the treatment of each malady, that the reader is urged to do absolutely all that is recommended, in the belief that no more than is here laid down can be accomplished safely without the assistance of a doctor."

After a careful inspection of this little work, we can speak highly of its merits. Its directions are clear, concise, and accurate, and given in simple non-technical language. No master or mate of a vessel should leave shore without taking a copy with him.

Index to the Nature and Scientific Names of Indian and other Eastern Economic Plants and Products. Originally Prepared under the Authority of the Secretary of State for India in Council. By J. Forbes Watson, M.A., M.D., F.L.S., F.R.A.S., etc., Reporter on the Products of India. London: Trübner and Co., 60, Paternoster Row. 1868.

A work evidently of great labour and research, and indispensable to all who desire a complete acquaintance with Indian and other Eastern Economic Plants and Products. We trust to be able to notice it fully in a future number.

Cabinet of Materia Medica for the "Modified Examination." Published by Evans, Lescher, and Evans, London; and Evans, Sons, and Co., Liverpool.

This Cabinet, which has been specially arranged for students preparing to pass the "Modified Examination" of the Pharmaceutical Society, contains sixty-seven specimens of the principal drugs and chemicals of the British Pharmacopœia, and the several plants required by the Board of Examiners.

When we state that the specimens are the best commonly found in commerce, that they are compactly arranged in a well-made cabinet, that each specimen has a descriptive label, and that the whole may be purchased for fifteen shillings, surely no one can now have any excuse for presenting himself at the "Modified Examination," and pleading ignorance of having had no opportunity of inspecting the principal drugs, etc., of the British Pharmacopœia.

BOOKS RECEIVED.

First Lines for Chemists and Druggists preparing for Examination before the Board of the Pharmaceutical Society. By J. Steggall, M.D., etc. Third Edition. London: John Churchill and Sons, New Burlington Street. 1869.

The Half-yearly Abstract of the Medical Sciences. July to December, 1868. Vol. XLVIII. London: John Churchill and Sons; Edinburgh: Maclachlan and Co.; Dublin: Fannin and Co.

PREPARING FOR PUBLICATION.

The "Modified Examination" of the Pharmaceutical Society; a Guide to the Principal Points in Prescriptions, Dispensing, Materia Medica, and Pharmacy. By F. Harwood Lescher. London: J. Churchill and Sons.

We hear that the above work is just ready for publication. It is intended to serve as a guide to the principal points in the several subjects comprised in the "Modified Examination." So far as we can form an opinion from a knowledge of its general plan and arrangements, we believe it will prove a real boon to those who are preparing for the Modified Examination.

THE CHEMISTS' BALL.

The Chemists' Ball having hitherto proved such a success, it has been decided to hold a similar *réunion* at Willis's Rooms, on Wednesday, the 20th of January; and judging from the support it has already met with, from the list of Stewards and Committee, we anticipate that it will prove a most successful and agreeable entertainment.

TO CORRESPONDENTS.

Persons having seceded from the Society may be restored to their former status on payment of arrears of subscription and the registration fee of the current year.

Those who were Associates before the 1st of July, 1842, are privileged (as Founders of the Society) to become Members, and by virtue of membership to be registered as *Pharmaceutical Chemists*.

The Secretary and Registrar desires to intimate that no anonymous communications, or letters signed with initials only, will be answered.

On the Syrupus Ferri Iodidi.—Mr. Hughes, of St. Leonard's, referring to some remarks by Mr. Holloway on this syrup, says, "My preparation is still colourless, and will remain so."

X. Y. Z.—Certainly not. They appear to be *Uva Ursi* leaves, but the specimen forwarded was broken into small pieces.

"*Botanist*" (Sunderland).—The new edition is in a forward state.

"*In a Fog.*"—(1, 2, and 3.) Not required.

C. M.—We think an examination by the Pharmaceutical Society would *not* exempt n the case referred to.

T. W.—The best remedy would be to prepare for, and pass, the Minor and Major examinations.

W. F. Gardner, General Advertising Agency.—Communication received.

"*Pharmacist.*"—A correspondent observes that Mr. Ince's suggestion is a very good one, and that "if all entitled to use the name were to have it so printed, whenever any new labels were required, it would soon familiarise the public with the term."

We have received a note from Mr. Ince, in which he states that a simple rule may be applied in the formation of derived words ending in *ist*, namely, take the root, add *ist*, and anglicise if necessary. This will obviate seeming anomalies. With regard to Pharmacy, many Greek words may be quoted as an illustration—amongst them φαρμακεία ipsa medicandi actio; ipsa medicamenta, and other meanings. Φαρμακεὺς—veneficus, also φαρμακεύω v. φάρμακον, medicamentum, first meaning venenum. Φαρμακοπώλης, seller of medicines. Φαρμακὸς, φαρμακόω v. poet. Here is one invariable root, anglicise and write it Pharmac- add *ist*, *i. e.* Pharmacist. The rule is best proved by apparent exceptions. 'Sophistry' does not become *Sophistrist*, because we find Σοφία, Σοφίζω, Σόφισμα, Σοφὸς, sapiens. Take the root, anglicise and write it Soph, add *ist*, *i. e.* Sophist. On the other hand, Anatomist, Chiropodist, etc., offer familiar examples of regular formation. There is an art called Chemistry—the man who practises it is not a Chemistrist, still less a Chemistreutist, but a Chemist, for a definite reason—finally, for the term "Pharmaceutist" there does not appear any reasonable philological defence.

M. P. S. (Oxton) is thanked for his communication. The subject is deferred, pending the completion of the "Regulations."

Mr. W. C. Halls (Brighton) is thanked for his communication respecting syrup of iodide of iron.

"Zn, SO_4, 7 H_2O" (Liverpool).—Refer to any elementary work on Chemistry.

T. H. K. (Bristol).—We think the employer is morally bound to sign the certificate in question, but under the circumstances would recommend application to one of the other parties named in the Act, whose signature would have equal weight.

"*Statim*" (Brixton).—*Pepsine Wine*, Vol. VI. (N.S.) page 192.

"*Dispenser*" (Chipping Sodbury).—Not eligible for the "Modified Examination."

C. F. (Guildford).—The letterpress is correct.

"*Botanist*" (Ipswich).—Yes. New editions of both works are in course of preparation.

"*Nec Caput nec Pedes.*"—(1.) Yes. (2.) Not difficult with moderate application to study. (3 and 4.) Yes. (5.) Dr. Attfield's 'Pharmaceutical Chemistry.'

I. R. F.—A paper on "Wheat Phosphates" will be found in this Journal, Vol. VII. (N.S.), page 525.

"*A Registered Student.*"—Tomes's 'Dental Surgery.'

"*An Apprentice*" (Stockport).—(1, 2.) No. See last number of the Journal.

A. S. (Clevedon).—It would be better to use the new editions of the works named.

E. C. E. (Thornbury).—Faraday's 'Lectures on a Candle,' through any bookseller.

"*Dispenser*" (Aberdeen).—(1.) Come to London the day before the Examination, and you will then be able to see what you desire in the library of the Pharmaceutical Society, or in any good library. (2.) If asked, you will be required to give the tests.

Appointment.—Mr. Alexander Young Stewart, F.C.S., late assistant to Dr. Thomas Anderson, F.R.S. Edin., Professor of Chemistry in the University of Glasgow, has been appointed chemical operator to the Society of Apothecaries, in the room of Mr. George Warington, resigned.

Instructions from Members and Associates respecting the transmission of the Journal before the 25th of the month, to ELIAS BREMRIDGE, Secretary, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Messrs. CHURCHILL, New Burlington Street. Other communications to the Editors, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. X.—No. VIII.—FEBRUARY, 1869.

PREPARING FOR EXAMINATION.

The new era we have entered upon in pharmacy has opened out a widespread inquiry for the means of acquiring technical knowledge where systematic instruction has not hitherto been provided. Scraps of learning picked up incidentally will no longer serve to fit the pharmaceutical student for his intended position. Crude, undigested, and disjointed facts, with a little practical knowledge of the routine of shop duties, are insufficient to qualify him for the certificate he must obtain from a board of examiners before he can present himself to the public as a competent pharmaceutist. The voluntary system of pharmaceutical education, which has been in operation for the last quarter of a century, has been too partial in its operation, and the means of applying it have not been sufficiently diffused throughout the country, to enable all those now requiring instruction, under the altered circumstances of their position, to enter at once upon an efficient method of preparing for the ordeal to which they must submit themselves.

How shall the young men who have commenced the study of pharmacy, who are still apprentices or assistants without any certificates of qualification, or with only such as were granted at the commencement of apprenticeship,—how shall these prepare themselves for the examinations to be passed before they can be registered as Chemists and Druggists or Pharmaceutical Chemists? This question is asked from month to month by hundreds of anxious youths who became pharmaceutical students before examinations were compulsory, and who, with limited means, are now compelled to seek the easiest method of bringing themselves within the requirements of the law.

We would willingly assist these young men to accomplish their object by pointing out the way in which they may make self-instruction available for the purpose. In doing so, however, it must be clearly understood that we deprecate any system of mere cramming. Knowledge, to be permanent and useful, must be built up, like a house or other permanent building, by successive additions judiciously made upon a solid foundation. It is not by heaping together any materials that may happen to come to hand, nor even by putting together the proper materials without any consideration of the order in which they are arranged, that a satisfactory result will be obtained. In the first place, there must be a well-defined conception of what the structure is to be, and what purpose it is intended to fulfil. Without a clear notion of design, of the adaptation of one part to another, and of the order in which the several parts should be placed, no satisfactory progress can be made in the work of construction. Great pains must be taken in laying the foundations well. The foundation-

stones may be few in number; they should be solid, as simple in form as possible, and so laid as not to require subsequent removal. Ample time should also be given to allow of the solidification of that which is to bear the superstructure. As the building proceeds the construction will necessarily become more complex, and the progress made may appear to be slow, but still the work must consist in adding one stone after another, each stone being fitted to its place in accordance with the predetermined plan. Thus, by successive additions made in proper order, a building suited for the purpose for which it was intended will be produced, and the time occupied in the work, and the pains taken to study all the parts and fit them well together, will be justified by the stability and usefulness of the structure.

It is in a somewhat similar way that the knowledge of a subject should be built up in the mind of the student. Its acquirement must be by successive additions of new matter, and it is most important that these additions should be made in the proper order, and that the knowledge of each fact as it is used should be thoroughly mastered before passing to another. The error most commonly committed in studying from books is, that the student, with a book before him, reads too much and understands too little. Let him take up any systematic work on chemistry, or botany, or materia medica, and read off ten pages. How much of the matter thus presented to his mind leaves a correct and lasting impression there? He thinks he understands what he reads, but he is apt to be very indulgent to himself in testing the accuracy of his conceptions. A page well studied, with every fact noted and paraphrased, would contribute much more useful information than more extended but more loosely conducted reading.

It is very important also that a proper selection of books should be made. The student is sometimes overwhelmed by the magnitude of the works before him. He takes up a book on chemistry, and finds it consists of a thousand pages of closely printed matter. If he is to study one page at a time, when shall he get to the end of his work? And this is but one subject out of many. He must either satisfy himself with taking a small part of the whole, or rushing from page to page he skims off, as he thinks, the cream, and fancies his knowledge to be much more real than, when rigidly tested, it proves to be.

In some respects, there is a want of books suited to the requirements of the class of students we are alluding to. Fownes's 'Manual of Chemistry,' and Pereira's or even Royle's 'Materia Medica,' are too voluminous to admit of their being studied in the way and for the purpose we have indicated. Much smaller works would answer much better. Roscoe's 'Lessons in Elementary Chemistry,' an excellent book of its kind, and Garrod's 'Essentials of Materia Medica,' or Scoresby-Jackson's 'Note-Book of Materia Medica,' would be found to answer the required purpose with reference to the subjects they treat of. Even something slighter than these, and treating the subjects in a different way, is required by many of the existing class of students. We have been glad to observe that attempts are being made to provide easy and simple lesson-books for pharmaceutical students who have but small means for getting assistance personally from teachers in preparing for their examinations. Lescher's 'Guide for the Modified Examination,' is a work of this description, which, we think, is likely to prove very useful. Similar works adapted for the other examinations are, we see, contemplated, and these, together with materia medica specimens furnished by Southalls and Dymond, and also by Evans and Lescher, will supply some of the most pressing wants of a numerous class of our correspondents, in reply to whose communications these remarks have been written.

THE PETROLEUM ACTS 1862, 1868.

In the last Session of Parliament an Act was passed, after much controversy with reference to its details, which led to its being greatly modified as compared with the form in which it was first introduced; and the short title of this Act is, "The Petroleum Act, 1868." Its object is to amend an Act having a similar title which was passed in 1862. Part of the Act of 1862 has been repealed by the Act of 1868, but with this exception the two Acts are to be read as one, and they have jointly come into operation in the present month (1st February, 1869). The principal object of these Acts is to provide for the safe-keeping of petroleum. In the Act of 1862, petroleum, for the purposes of the Act, was defined to be, *petroleum or any product thereof that gives off an inflammable vapour at a temperature of less than* 100° *F.* By the Act of 1868 this definition has been enlarged, so that now, "*Petroleum shall include all such rock oil, Rangoon oil, Burmah oil, any product of them, and any oil made from petroleum, coal, schist, shale, peat, or other bituminous substance, and any product of them, as gives off an inflammable vapour at a temperature of less than* 100° *F.*"

It is important here to determine what is included under the term petroleum as now used in the Acts. Does petroleum include benzol and the compound anæsthetic ether used for the spray? Benzol is obtained from coal-tar, and must certainly come under the definition if it can be shown that it is a *product* made from an oil obtained from coal, etc. Perhaps it might be contended that it is an *educt* and not a *product;* but we presume the word product was not intended to be used in this restricted sense in the Act. Again, the compound anæsthetic ether contains the most volatile of the hydrocarbons present in petroleum; and if this is not the kind of product intended to be comprised under the definition, what is? Yet it can hardly be supposed that the regulations specified in the Act were intended to apply to benzol and its preparations, and the compound anæsthetic ether.

According to the Act of 1862 it was unlawful for any person to keep more than forty gallons of petroleum within fifty yards of a dwelling-house or of a building in which goods are stored, without having a licence for doing so; but this, the 3rd section of that Act, is repealed by the Act of 1868, and the law now stands, that "*no petroleum shall be kept, otherwise than for private use, within fifty yards of a dwelling-house or of a building in which goods are stored, except in pursuance of a licence given in accordance with the Petroleum Act,* 1862." It is further enacted that "there may be annexed to any such licence such conditions as to the mode of storage, as to the nature of the goods with which petroleum may be stored, as to the testing such petroleum from time to time, and generally as to the safe keeping of petroleum, as may seem expedient to the local authority."

The unsophisticated druggist may possibly exclaim, what! all this fuss about a bottle of "scouring drops," or a little solution of gutta percha.

We are not prepared to say, and indeed, we do not think, the Act was intended to be thus applied, but if strictly interpreted, it seems to take in all the very volatile hydrocarbons obtained from petroleum or any of the tar products, whatever their source.

The Act of 1862 applied only to the keeping of petroleum, but in the Act of 1868 a new feature is introduced, inasmuch as the law now regulates the mode of selling it as well as keeping it for sale.

Section 5 provides as follows:—

"No person shall sell or expose for sale for use within the United Kingdom, any description of petroleum, from and after the first day of February, one thousand eight hundred and sixty-nine, which gives off an inflammable vapour

at a temperature of less than one hundred degrees of Fahrenheit's thermometer, unless the bottle or vessel containing such petroleum have attached thereto a label in legible characters, stating as follows: 'Great care must be taken in bringing any light near to the contents of this vessel, as they give off an inflammable vapour at a temperature of less than one hundred degrees of Fahrenheit's thermometer.' Any person acting in contravention of this section shall for each offence be subject to a penalty not exceeding five pounds."

The mode of ascertaining the temperature at which inflammable vapour is given off, is described in a schedule to the Act, and is as follows :—

"*Directions for applying the Flashing Test to Samples of Petroleum Oil.*

"The vessel which is to hold the oil shall be of thin sheet iron; it shall be two inches deep and two inches wide at the opening, tapering slightly towards the bottom; it shall have a flat rim, with a raised edge one quarter of an inch high round the top; it shall be supported by this rim in a tin vessel four inches and a half deep and four and a half inches in diameter; it shall also have a thin wire stretched across the opening, which wire shall be so fixed to the edge of the vessel that it shall be a quarter of an inch above the surface of the flat rim. The thermometer to be used shall have a round bulb about half an inch in diameter, and is to be graduated upon the scale of Fahrenheit, every ten degrees occupying not less than half an inch upon the scale.

"The inner vessel shall be filled with the petroleum to be tested, but care must be taken that the liquid does not cover the flat rim. The outer vessel shall be filled with cold, or nearly cold, water; a small flame shall be applied to the bottom of the outer vessel, and the thermometer shall be inserted into the oil so that the bulb shall be immersed about one and a half inches beneath the surface. A screen of pasteboard or wood shall be placed round the apparatus, and shall be of such dimensions as to surround it about two-thirds, and to reach several inches above the level of the vessels.

"When heat has been applied to the water until the thermometer has risen to about 90° Fahrenheit, a very small flame shall be quickly passed across the surface of the oil on a level with the wire. If no pale blue flicker or flash is produced, the application of the flame is to be repeated for every rise of two or three degrees in the thermometer. When the flashing-point has been noted, the test shall be repeated with a fresh sample of the oil, using cold, or nearly cold, water as before; withdrawing the source of heat from the outer vessel when the temperature approaches that noted in the first experiment, and applying the flame test at every rise of two degrees in the thermometer."

TRANSACTIONS

OF

THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *January 6th*, 1869,

Present—Messrs. Bottle, Bourdas, Carteighe, Deane, Edwards, Evans, Haselden, Hills, Morson, Sandford, Savage, Squire, Stoddart, and Williams,

The following Pharmaceutical Chemists were elected

MEMBERS.

Armitage, Edmund Hewson .....Brighton.
Bartley, George Aloysius .....

Baxter, Robert.....Huntingdon.
Botham, James .....Manchester.
Cheese, Henry .....Coleford.
Cromwell, Oliver.....Wandsworth Road.
Davidson, James Noble .....Elgin.
Day, John.....Barnsley.
Duncanson, William .....Stirling.
Eve, Charles.....Hampstead.
George, William .....
Gilmour, Andrew .....Burntisland.
Gittoes, Samuel James .....Wednesbury.
Hughes, John Taylor .....Altrincham.
John, David William .....Pembroke.
Johnstone, Charles Andrew .....Manchester.
Jones, John Edwards .....Cardigan.
Kinch, Charles James.....Henley-on-Thames.
Manning, Thomas Davys .....Yeovil.
Martin, Frederick Robertson.....Bristol.
Martindale, William .....London.
Nurthen, Frederick Richard .....London.
Parsons, Frederick .....Leicester.
Payne, Sidney .....Wallingford.
Pratt, Joseph .....Aberdare.
Speechly, George .....Bishop Stortford.
Tasker, William .....London.
Turner, John .....Aylesbury.
Walker, Walter Tracey .....Maidstone.
Walton, William.....Manchester.
Ward, George .....Leeds.
Yewdall, Edwin .....Leeds.
Young, John .....Newport, Mon.

The following, having paid their arrears and their subscriptions for the current year, were restored to Membership:—

Bowring, John W. .....Cardiff.
Broad, John.....London.
Davis, Samuel Forbes .....London.
Fairgrieve, Thomas.....Edinburgh.
Harrison, Robert Hooper .....London.
Hartshorn, Thomas.....Ironbridge.
Hodgkinson, William .....London.
Hurstwick, Thomas H. .....Liverpool.
Kiddle, William Lambert .....London.
Knight, James.....London.
Lloyd, Arthur .....London.
Paul, Evans Edwin.....Cleobury Mortimer.
Portello, William .....London.
Potts, Richard S.....Ilkestone.
Provost, John P.....Huntingdon.
Radford, J. C. .....Devonport.
Rees, James.....Totness.
Slater, William Henry .....Romsey.
Stone, Thomas W. .....St. Leonard's.
Suteliffe, William .....Stalybridge.
Watson, Horace .....Laceby.
Whitaker, John .....London.
Williams, Thomas .....Carlton.

The following, Associates of the Society registered before July, 1842, were elected

MEMBERS.

Atmore, George .....King's Lynn.
Coble, John Nickerson .....Great Yarmouth.
Perks, Samuel .....Hitchin.
Sylvester, Paul.....Rusholme.
Wine, John Alfred .....Bristol.

The sum of £20 was granted from the Benevolent Fund to a distressed Member of the Society residing in Jersey.

SPECIAL MEETING OF COUNCIL, *January 14th*, 1869,

Present—Messrs. Bourdas, Carteighe, Deane, Hills, Morson, Sandford, and Williams,

The Bye-Laws were approved and confirmed.

EXAMINATIONS IN LONDON.

January 8th, 1869.

MODIFIED EXAMINATION.

Present—Messrs. Bird, Carteighe, Cracknell, Darby, Davenport, Deane, Edwards, Evans, Gale, Garle, and Haselden.

Thirty-seven candidates presented themselves for Examination; the following thirty-one passed, and were duly registered as

CHEMISTS AND DRUGGISTS.

Batting, Thomas Gilbert .....Wokingham.
Bedford, Christopher .....Leominster.
Blyth, Utton .....London.
Brown, Edward William .....Great Malvern.
Butler, William James Gooch .....Norwich.
Carter, Frederick Lewis .....Canterbury.
Clark, Thomas Probert .....Worcester.
Collett, William Jonas .....Fakenham.
Cooper, William Whirledge .....London.
Corps, Charles.....London.
Cutting, John Charles.....Liverpool.
Douthwaite, George Liddell .....Newport, Salop.
Gowen, Albert.....Stratford-on-Avon.
Green, John.....Banbury.
Harding, Samuel Jervis .....Worcester.
Howes, John Manning .....Leamington.
Hughes, John Edward .....Bath.
Johnson, Henry .....Barnsley.
Madgwick, Rufus.....Stratford-on-Avon.
Marshall, James .....Stamford.
Miller, Edward .....London.
Nugent, George Thomas.....Brighton.
Oakes, George .....London.
Palmer, Philip Lintell.....Surrey.
Simeo, Frederic .....Wellingboro'.
Smith, Percy John .....London.
Stimpson, George William.....London.
Waite, John Henry.....Scarborough.
Williams, William .....Hampstead.
Wilton, Richard .....Devizes.
Woolley, Henry James .....London.

January 15*th*, 1869.

MODIFIED EXAMINATION.

Present—Messrs. Bird, Carteighe, Cracknell, Darby, Davenport, Edwards, Gale, Garle, Haselden, and Southall.

Forty-five candidates presented themselves; the following thirty-eight passed, and were duly registered as

CHEMISTS AND DRUGGISTS.

Andrews, Henry Taylor .....Bristol.
Ashton, Thomas Gray.....London.
Attenburrow, George John .....Hertford.
Bentley, Michael John .....Headingly.
Bisson, Philip Nicholas .....Hawkhurst.
Brown, James .....Ampthill.
Carr, Joseph .....Wakefield.
Dale, John .....Birmingham.
Deane, Alfred .....Brighton.
Dyer, Walter .....London.
Foulds, Astley Cooper .....Bath.
Frith, John Bruff .....Ipswich.
Goodchild, William Henry .....London.
Hicks, John.....London.
Hind, Thomas William Linton .....Kendal.
Jackson, Roberts.....London.
Job, Thomas .....London.
Jones, William Edward .....London.
Jones, William James..... .....London.
Kerruish, Edward John .....Hampstead.
Langridge, Thomas Benjamin .....Midhurst.
Lemmon, Charles .....Worthing.
Lumiss, James .....London.
Morgan, Henry .....London.
Morris, John Thomas .....Faversham.
Moses, Tertius Robert .....Shrewsbury.
Muston, George Gladstone .....Maidstone.
Nicklinson, Thomas .....Derby.
Pearce, Frank Tring .....Gloucester.
Pike, Charles .....Brixham.
Rendell, Walter John.....London.
Sanderson, William, jun. .....Sunderland.
Sloman, Richard .....Norwood.
Smith, John.....Manchester.
Smith, Robert Scarborow .....London.
Taylor, William Gee .....Hungerford.
Watmough, Henry.....Hitchin.
Wooster, John Ratliff ....London.

January 20*th*, 1869,

Present—Messrs. Bird, Carteighe, Cracknell, Darby, Davenport, Deane, Edwards, Evans, Gale, Garle, Hanbury, and Haselden.

Nineteen candidates presented themselves for the Major and Minor Examinations; the following fifteen passed, and were duly registered:—

MAJOR (as a Pharmaceutical Chemist).

*Conder, George .....Walworth.

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* Passed in honours; eligible at the end of the Session, to compete for the Pereira Medal.

MINOR (as Chemists and Druggists).

*Chilwell, Joseph	Newcastle-on-Tyne.
Cockburn, George	Sunderland.
Hart, James	Manchester.
*Histed, Edward	Tonbridge.
*Iliffe, George	Nuneaton.
*Iredale, George	Leeds.
Jackson, John	Tadcaster.
Porter, William Albert	Richmond, S.W.
Reeler, John William	Cape Town.
Skipper, Edward	London.
*Smith, Frederick Warren	Market Drayton.
Speakman, Isaac	Runcorn.
Torbitt, Charles	Birmingham.
Walker, John Wesley	Maidenhead.

REGISTERED APPRENTICES AND STUDENTS.

Name.		Address.
Ashby, Thomas Lacey	Mr. Merryweather	Leicester.
Atkinson, Skelton	Mr. Whitwell	Thirsk.
Baldwin, Edwin	Messrs. Nunn and Hinnell	Bury St. Edmund's.
Barnes, Francis Joshua	Mr. Barnes	Preston.
Barnes, Rennie Burford	Messrs. Rew and Co.	Sandgate.
Bayes, James	Messrs. Garratt	Rugby.
Bird, Matthew	Mr. Wells	Lynn.
Bokenham, John Wm. London	Mr. Andrews	Norwich.
Bond, Peter Gillard	Mr. Balkwill	Kingsbridge.
Brechon, Hugh Scott	Mr. Mead	Whitby.
Brett, Thomas	Mr. Flooks	Sherborne.
Bright, John Valentine	Mr. Bright	Bath.
Bryars, William Hudson	Mr. Hasselby	Goole.
Camplin, John	Mr. Longrigg	Appleby.
Cann, Charles John	Mr. Rubbra	Greenwich.
Cartmate, Alfred Henry	Mr. Horton	Birmingham.
Chadwick, James	Mr. Reinhardt	Leeds.
Cole, Frederick	Mr. Rowe	Redruth.
Cox, Richard Cobden	Mr. Cox	Brighton.
Crisp, Frederick Arthur	Mr. Deane	Clapham.
Dovey, John	Messrs. Jones and Son	Carmarthen.
Dunn, George Redman	Mr. Chessall	Sidmouth.
Dunn, John	Mr. Hunter	Aberdeen.
Edwards, George	Messrs. Davies and Shepheard	Chester.
Elliott, George E.	Mr. Crofts	Chatham.
Farrow, William Joseph	Mr. Lateman	Modbury.
Fisher, Richard	Mr. Sharples	Preston.
Flewitt, Edmund	Mr. Flewitt	Birmingham.
Florance, John Draper	Mr. Gadd	Kingsland.
Foulsham, Harry Botwright	Mr. Lyon	Ipswich.
Furmston, Samuel Chambers	Mr. Furmston	High Wycombe.
Goldsmith, John Jackson	Mr. Goldsmith	Abingdon.
Gordelier, John Thomas	Mr. Gordelier	Sittingbourne.
Griffith, John	Mr. Todd	Hastings.
Grose, Nicholas Mall		Wadebridge.
Groves, Henry	Mr. White	Nottingham.
Harding, Richard May	Mr. Kendall	Stratford-on-Avon.
Hardcastle, Stephen B.	Mr. Potter	Knaresborough.

* Passed in honours; eligible, at the end of the Session, to compete for the Prize of Books.

NAME.		ADDRESS.
Harvey, John William	Messrs. Moore and Son	Brighton.
Hicking, Joseph	Mr. Calvert	Belper.
Holdgate, Arthur	Mr. Cocher	King's Lynn.
Horton, Charles	Mr. Atkins	Birmingham.
Hughes, Rowland	Mr. Williams	Carnarvon.
Humphry, Horatio	Mr. Walden	Southampton.
Hunt, Edward Joshua	Mr. Green	Dudley.
Hurley, William	Mr. Hall	Canterbury.
Lancaster, William George	Mr. Jenkinson	Sheffield Moor.
Lander, Henry	Mr. Wand	Leicester.
Lawman, Charles	Mr. Chantler	Newport Pagnell.
Leake, Thomas Whaplate	Mr. Owen	London.
Leicester, Thomas Cotton	Mr. Noakes	Brighton.
Lewis, Enoch	Mr. Kains	Manchester.
Lloyd, William H.	Mr. Williams	Carnarvon.
Lowe, James Russell	Mr. Wand	Leicester.
M'Clelland, William	Mr. Bayley	Brownhills.
M'Naughton, William	Messrs. Grattan and Co.	Belfast.
Martin, Charles Edward	Mr. Pitts	Norwich.
Munro, John Morrison	Mr. Hunter	Aberdeen.
Newman, Arthur	Mr. Furmston	High Wycombe.
Newzam, William Henry	Mr. Pratt	Otley.
Nicholas, Benjamin Morris	Mr. Troas	Bristol.
Nicholas, Joshua Vaughan	Mr. Nicholas	Narberth.
Nockolds, Stephen William	Mr. Jull	Horsham.
Parkinson, Charles	Mr. Barnes	Preston.
Pattison, Thomas	Messrs. Southall	Birmingham.
Paulden, William Newton	Mr. Paulden	Altrincham.
Phillips, James Alfred		Guildford.
Pick, Richard	Mr. Earle	Hull.
Pitts, Thomas Cruso	Mr. Pitts	Norwich.
Place, John Newton	Mr. Sturton	Cambridge.
Pownall, Thomas	Mr. Birch	Mold.
Pratt, James	Mr. Yeomans	Cambridge.
Read, Henry Holditch	Messrs. Sturton and Sons	Peterborough.
Reinhardt, William T.	Mr. Reinhardt	Leeds.
Roberts, Charles Llewelyn	Mr. Hilditch	Rhyl.
Roberts, Edmund	Mr. Sturton	Cambridge.
Rogers, Sydney	Mr. Chantler	Newport Pagnell.
Russel, Thomas Gregory	Mr. Sturton	Cambridge.
Sandy, Frederick William	Mr. Picnot	Strood.
Shaw, Leonard Firth	Messrs. Williams and Fitzhugh	Nottingham.
Shaw, William Bourne	Mr. Steward	Bridgnorth.
Sheppard, Ebenezer	Mr. Mason	Birmingham.
Sherris, Harry	Mr. Newman	Falmouth.
Shipham, John Martin	Mr. Horton	Liverpool.
Smith, John Jacob	Mr. Maggs	Yeovil.
Smith, Sydney Lloyd	Mr. Smith	Walworth.
Smith, Tenison	Mr. Field	Cambridge.
Snow, William	Mr. Roberts	St. Alban's.
Speight, Robert	Messrs. Tomlinson & Hayward	Lincoln.
Sprake, David Lewis	Messrs. Jones and Son	Carmarthen.
Sproston, Harry	Mr. Palmer	Birmingham.
Stansby, Charles John	Mr. Burnham	Derby.
Storey, Edward Henry	Mr. Bird	London.
Squire, Thomas	Mr. Handford	Great Torrington.
Symonds, Henry	Mr. Pitts	Norwich.
Talbot, T. H.	Mr. Izod	Upper Norwood.

Name.		Address.
Thresh, John Clough	Mr. Butler	Pontefract.
Tonks, Joseph	Messrs. Fleeming and Son	Wolverhampton.
Townley, Thomas William	Mr. Bell	Ambleside.
Tripp, Zeno	Mr. Turney	Plymouth.
Turner, Charles	Mr. Barnett	Buxton.
Twemlow, Richard	Messrs. Fowke and Son	Stafford.
Walton, John	Mr. Palmer	Birmingham.
Warner, Geo. Henry Quibell	Mr. Vawser	March.
Watmough, George Capes	Mr. Capes	Caistor.
Wildgoose, George Hudson	Mr. Wildgoose	Dronfield.
Wright, Eli Albert	Mr. Brown	Tipton.
Wright, Joseph	Mr. Silvester	Knutsford.
Young, John Rymer	Mr. Young	Warrington.

EXAMINATIONS IN EDINBURGH.

January 7th, 1869.

Present—Messrs. Ainslie, Aitken, Brown, Buchanan, Mackay, and Young.

MODIFIED EXAMINATION.

Eleven candidates presented themselves; the following seven passed, and were duly registered as

CHEMISTS AND DRUGGISTS.

Carrick, John	Edinburgh.
Duncanson, Andrew	Edinburgh.
Jarvis, David	Golspie.
Keomath, Wm. Ramsay	Glasgow.
Moir, David	Edinburgh.
Paterson, James	Helmsdale.
Wright, James	Stirling.

The following passed the Preliminary Examination, and were registered as

APPRENTICES OR STUDENTS.

Fraser, William	Portree.
Scobie, James	Perth.
Macmillan, James	Perth.

January 19th, 1869.

Present—Messrs. Ainslie, Aitken, Brown, Buchanan, Mackay, and Young.

MAJOR (registered as a Pharmaceutical Chemist).

Mathew, William Henry	Belfast.

MINOR (registered as a Chemist and Druggist).

Cleghorn, Alexander	Cupar.

MODIFIED EXAMINATION.

Five candidates presented themselves; the following three passed, and were duly registered as—

CHEMISTS AND DRUGGISTS.

Garry, George	Glasgow.
Miller, James	Edinburgh.
Pattinson, Michael Herd	Chard.

PHARMACEUTICAL MEETING.

Wednesday Evening, January 6th, 1869.

MR. H. SUGDEN EVANS, VICE-PRESIDENT, IN THE CHAIR.

The Minutes of the previous Meeting having been read, the following

DONATIONS TO THE LIBRARY AND MUSEUM

were announced, and the thanks of the Meeting given to the respective donors thereof:—

Catalogue of Scientific Papers, vol. ii.: from the Royal Society,—Catalogue of the Third and Concluding Exhibition of National Portraits: from the Committee of Council on Education,—Faraday's Chemical Manipulation, Barber's Pocket Companion to the Pharmacopœias, Owen's Conspectus of the Pharmacopœia: from the Registrar,—Florula Discoana; Contributions to the Phyto-Geography of Greenland: from R. Brown, F.R.G.S., —Specimen of Carbonate of Magnesium: presented by Mr. B. S. Proctor,—Fruits of *Areca Catechu*: presented by Mr. Mackmurdo,—Resin of the Coral plant (*Ceradia furcata?*), from the mainland opposite the Isle of Icaboc, Africa; the donor thinks this is the produce of a species of *Sarcocaulon*, DC. (=*Monsonia*, Linn. f.): presented by Rev. J. C. Brown, LL.D.,—Seven specimens of Sulpho-carbolates: presented by Mr. J. Balmer,—Specimen of Mexican Copalchi Bark, from a recent import: presented by Mr. Collins (Curator).

Dr. REDWOOD drew attention to the specimens of sulpho-carbolates on the table; they were a class of salts recently introduced into medical practice. These specimens had been presented by Mr. Balmer, of Islington, and were prepared by acting upon carbolic acid with sulphuric acid at a temperature of 280° or a little higher. They appeared to possess the same properties as carbolic acid, and, if this proved to be the case, would be much preferable in many cases, as they did not possess the strong odour of that acid.

The following papers were read:—

ON HOME-GROWN PODOPHYLLUM AND JALAP.

BY WALTER G. SMITH, M.B. DUBLIN.

FELLOW OF THE COLLEGE OF PHYSICIANS; ASSIST. PHYS. TO THE ADELAIDE HOSPITAL.

The influence of climatic conditions on the characters and secretions of plants offers an interesting field for inquiry as a branch of botanical geography, and in connection with economic considerations; and I propose, in the following brief communication, to describe specimens of podophyllum and of jalap which have been cultivated in the Botanic Gardens of Trinity College, Dublin, referring more especially to their respective yield of resin, as compared with the amount afforded by these plants when grown in the New World, their native habitat.

Since we know that temperature is the prime regulator of the distribution of plants, and that isothermal lines may be taken as more or less correct indicators of the general climatic conditions of any locality, the study of the isotherms of different countries will guide us in estimating the probability of a plant being likely to adapt its mode of life to diverse circumstances. Meyen was of opinion that when a sufficient number of meteorological observations have been made, we shall even beforehand be able to determine exactly whether a plant may be transplanted from its indigenous station to another, or whether this trouble would be unrewarded.

The climate of Great Britain and Ireland is insular, *i. e.* the summers are cool and the winters mild, while the broad features of the North American climate are, that its summer is in general cooler than that of Europe, under corresponding latitudes and distances from the sea, and that its winter is very cold, *i. e.* it has a continental winter climate and an insular summer climate. The extremes of temperature for the year are greater in North America than in Europe, and that difference increases with the latitude. Hence on this account, and also because the amount of heat which a plant receives during the period of its greatest activity is of chief importance, we should attach more value to the monthly than to the annual isotherms.*

The mean annual temperature of Dublin is 50°, and its mean summer temperature about 60°, or 58°·6 according to a series of observations extending between the years 1792–1852. By comparing the mean temperature of Dublin for the months of May, June, July, August, and September, with the course of the isothermal lines for these months respectively, as laid down on Dove's charts, we see at once that, on the whole, the mean summer temperature of the United States is considerably higher than that of Dublin.

July is the warmest month from the pole to 40° latitude, and therefore will exercise a large influence on the development of organic proximate principles. Taking into account, then, the wide distribution of *Podophyllum peltatum* throughout the United States, from the New England States to Georgia, *i. e.* between 30° and 45° latitude, and its consequent subjection to various phases of climate, and coupling that with the above facts as to temperature, we might expect that the plant should flourish in the British Isles. But though it might vegetate well and put on a healthy appearance, it does not follow that the constituents of a plant should be found identical in every respect in different quarters of the globe, particularly when we remember that in some cases slight changes of soil and surrounding circumstances are competent to cause notable variations in the formation of active principles. In other instances, however, transplantation to another soil under careful management and subject to similar conditions of climate, does not militate against the development of medicinal properties, and of this the success of the cinchona plantations on the Neilgherry Hills, whose yield of alkaloids compares favourably with that derived from the Peruvian forests is a conspicuous and familiar example.

No plant exhibits more strikingly the influence of temperature than hemp. In these countries it shoots up luxuriantly and produces fibre of valuable quality, but is almost destitute of its peculiar narcotic resin, having little or no odour, and feeling scarcely adhesive when handled, while under an Indian sun it becomes loaded with clammy resin and its fibre is of little value. Again, in the case of the gum-bearing acacias, an elevated temperature is essential to the production of their viscid exudation, for though the tree may flourish in cooler climates, it then yields no gum.

Examination of the resin extracted from the podophyllum root shows that the species is readily acclimatized, and elaborates its characteristic secretion, which retains its activity of effect.

The specimen of the rhizome in the Museum of Materia Medica, Trinity College, Dublin, agrees exactly in physical characters with American podophyllum as to thickness, colour, fracture, etc., and it would be almost impossible to distinguish between them.

The method adopted for extracting the resin was as follows :—312 grains of the dried, coarsely-powdered drug, was macerated in a small quantity of alcohol,

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* The isothermal lines of the globe for every month of the year are delineated in Professor Dove's work, 'Die Vorbreitung der Wärme,' for the use of which I am indebted to the Rev. Dr. Haughton.

sp. gr. 0·845, for six days, with occasional agitation. It was then transferred to a percolator, and the percolation continued till a few drops of the fluid, when evaporated, left but a slight residue, which was soluble in water. The spirit was distilled off till the liquid was of a syrupy consistence, and it was then poured into about eight times its bulk of distilled water, constantly stirring. The light yellow flocculent precipitate which fell down was allowed to stand for twenty-four hours, then filtered off and dried. The concentrated filtrate was added to twice its bulk of water, acidulated with hydrochloric acid. The precipitate, consisting of muriate of berberine and probably also of a little resin which had not been previously precipitated, was collected as before.

Resin precipitated by water, 12·543 grs.	= 4·02	per cent.
Precipitated by HCl, 1·641 grs.	= 0·52	,,
	4·54	,,

Mr. Tichborne, who at my request kindly undertook the analysis of another portion, obtained by the process of the British Pharmacopœia, 4·8 per cent. of resin, besides a small additional quantity of hydrochlorate of berberine.

In a previous experiment I found that one day's maceration before the percolation did not answer so well, and that a less amount of resin was the result. For some reasons I thought it possible that the resin might include sulphur as a constituent, but an experiment performed with that view gave negative results. It is worth noticing, that the solution of the resin in nitric acid was at first of a clear deep red, and that the addition of a little water caused a greyish-yellow precipitate; the solution ultimately became green. The resin of jalap, when similarly treated, gave a yellow solution with nitric acid, and a milky-white precipitate on the addition of water.

From the foregoing analyses it will be seen, that the percentage of resin is good, and is fully equal to that of American podophyllum, which Parrish states at 3·75 per cent., and Wood gives as varying from 3·12 to 5·25 per cent. This high yield of resin is the more remarkable, since the soil of the Botanic Gardens is dry, though the plant naturally favours moist shady woods or low damp situations, and is only occasionally found in dry and exposed localities. The apparent percentage of resinoid matter is sometimes fictitiously increased by the practice of adding alum or other reagents, in order to promote the precipitation of the resin.

Mr. J. Spearing found alumina in five out of twelve commercial specimens; two contained iron, and one copper. A specimen that I have in my collection contains both alumina and lime. It is probable that the exceptionally dry and hot summer through which we have passed, was not without influence on the secretion of resinous products, such as those under discussion. Thus, the mean temperatures at Dublin for the months of May, June, and July, of the past summer, were 52·37, 58·20, and 60·21, answering respectively to 51·89, 58·03, and 59·84, the mean for the four years preceding.

According to Mr. Glaisher, "there is no instance in ninety-eight years of so high a mean temperature in the corresponding quarter (July, August, September), as in the present year." The deficiency of rain during these three months amounted to two and a half inches. A striking instance of the prevailing high temperature of the summer months was afforded by the unusually fine growth of the castor-oil plant, a native of the East Indies and north of Africa, which reached a height of six or seven feet, and produced seeds in October, many of which nearly approached maturation, and exhibited their characteristic markings. But the point which it was of greatest interest to ascertain was, whether the resinoid principle was possessed of physiological activity equal to that of American podophyllum, and to this end the following experiments were made:—

Oct. 5th.—I took ¼ gr. of the resin after breakfast. A good deal of flatulence was caused in the evening, but no purgation.

Oct. 7th.—Took ¼ gr. before breakfast. No decided effect.

Oct. 8th.—Took ½ gr. before breakfast. No catharsis followed.*

Oct. 29th.—Took 1 gr. before breakfast. No palpable effect till 5 P.M., when I felt some wandering pains in the abdomen; at 9 P.M., a small solid evacuation was provoked, and at 12 P.M. a copious loose stool followed. The next morning two more thin dejections resulted, attended with some griping pains and an uncomfortable feeling of chilliness.

Nov. 8th.—Took ½ gr. at bedtime. Flatulence in the morning, and an increased action of the bowels in 9·5 hours.

Nov. 9th.—Took ½ gr. at bedtime. Purgation in 8·5 hours.

Oct. 29th.—Administered 1 gr. of the resin to a young gentleman in health before going to bed. Next morning a free motion ensued. During the day he was annoyed with flatulence, nausea, loss of appetite, chilliness, and griping pains, and the bowels were opened twice loosely. The succeeding morning and the day after the cathartic action was still manifested, and, in all, six motions were obtained.

From this would appear the irritant properties of the drug, which externally are more evident, and manifest themselves in rubefaction, vesication, and even rapid pustulation. Temporary contact of podophyllum with the nose or eyelids will cause inflammation and suppuration. The time intervening between the successive operations of the drug is set forth in the accompanying table :—

Dose.	A. Effects.	Time.	Dose.	B. Effects.	Time.
¼ gr.	No purgation.			Free motion in . .	9 hrs.
½ gr.	Ditto.			Ditto	13 „
½ gr.	Flatulence and slight purgation in . .	9·5 hrs.	1 gr.	Slight motion in .	18 „
				Loose motion in .	33 „
½ gr.	Purgation in . . .	8·5 „		Ditto	48 „
	Griping pains in . .	9 „		And lastly in . .	50 „
	Slight motion in . .	13 „			
1 gr.	Copious motion in .	16 „			
	Ditto	24 „			
	And again in . . .	25 „			

If we now compare these results with the details furnished in the Report of the Committee on the Hypodermic Method of Injection (Med. Chir. Trans. vol. 50), we see how closely analogous they are, excepting that the Irish podophyllin seems to be borne in larger doses. Yet Stillé gives the average dose of podophyllin as two grains; but I may remark that he treats of the resin as precipitated by water alone, and accordingly containing no berberina.

Now, as the so-called podophyllin may, according to the mode of its preparation, contain a small quantity of the native salt of berberina, a larger proportion of the muriate of berberina, or no alkaloid at all, it is probable that its action on the animal economy is correspondingly modified.

A peculiar characteristic of the subcutaneous injection of this drug was, that free diuresis was caused in about twenty-four hours after purgation.

Judging, then, from these two sets of experiments, we may, with Dr. Bigelow, consider podophyllum as a certain extremely active and hydragogue cathartic, in some respects resembling jalap in its operation, but much slower and more permanent in its effects. When ingested by the mouth, in ordinary doses

* I was suffering from dissection-boils at the time.

catharsis is seldom manifested before nine hours. It appears to act chiefly on the upper part of the small intestine, and is apt to occasion unpleasant nausea and depression.

Committee's Experiments on Healthy Men.

Dose, $\frac{3}{10}$ gr.	Effects.	Time.	Dose.	Locality.	Effects.	Time.	Dose.	Locality.	Effects.	Time.
		hrs.	gr.			hrs.	gr.			hrs.
Skin . .	Copious motion .	2	$\frac{1}{6}$	Skin .	Free purgation .	6·5	$\frac{1}{6}$	Skin .	Purgation in . . .	9
Mouth	Purgation in . . .	9			And again in .	13			And again in .	13
	And again in .	18	$\frac{3}{10}$	Mouth	Copious purgation	18	$\frac{3}{10}$	Mouth	Purgation in . . .	11
Rectum	Action of bowels .	3	$\frac{3}{10}$	Rectum	Slightly in . . .	8			And again in .	18
	Purgation in . . .	18			Freely in	15	$\frac{3}{10}$	Rectum	Purgation in . . .	9
									And again in .	12

The evidence as to the supposed cholagogue action of podophyllum is, it seems to me, very inconclusive, notwithstanding that Dr. Ramskill is "almost tempted to say that there is no real cholagogue known in medicine except podophyllin;" and some extravagant theorists, starting from this fancied analogy to mercury in one respect, have conceived that the parallel was complete between them, and that patients might with advantage undergo a course of "vegetable calomel" instead of the "pernicious mineral."

No sufficient number of cases have, as yet, been adduced to warrant such a conclusion, and we may reject it as a gratuitous hypothesis destitute of any therapeutical value.

There is no class of local remedies respecting which it is more difficult to gain satisfactory information than cholagogues; and when we consider that the possession of this specific property by any medicine, except *perhaps* mercurials, is at best doubtful, we shall be slow in ascribing such a special direction to the action of podophyllum. Possibly, as Dr. Wood suggests, if the bile be so thick and viscid that it cannot escape with facility, a secretory stimulant like the May-apple will so dilute the bile that it will readily flow, and thus give the stools a highly bilious appearance, although there has been no real increase in the hepatic secretion, or its assumed cholagogue virtues may owe their explanation to the compression exerted on the gall-bladder, and the consequent expulsion of its contents during the operation of any active purge.

Passing now from podophyllum, I shall very shortly refer to the result of the analysis of the jalap plant which has been cultivated in the Botanic Gardens for several years past, growing against a wall with a southern aspect. The "station" of the *Exogonium purga* is on the high ground in the neighbourhood of Vera Cruz, at an altitude of 6000–7000 feet, and the mean annual temperature of these elevated slopes is about 66°–68° F. The town of Xalapa marks, as it were, the transition of the tropical vegetation of the plains into a highland flora.

The jalap plant naturally affects a warm and very moist climate, and prefers the shady woods on the eastern slopes of the Mexican Andes, where there is a deep, rich vegetable soil. If these conditions could be fulfilled at home or abroad, the cultivation of jalap might probably be attempted with success, an object to be more especially desired of late years, as the present supply of jalap is uncertain, the quality of the drug variable, and other roots, are not unfre-

quently mixed with the jalap of commerce. Mr. Hanbury suggests Cornwall, Devonshire, the Isle of Wight, Madeira, and in particular the neighbourhood of Ootamacund on the Neilgherry hills as suitable localities for the introduction of the plant. Even already, to some extent, the *Exogonium purga* is under culture in the south of France, and it is much to be wished that other analyses of European jalap should be published, in order that we may form a correct judgment as to the real prospects of success. (See paper by D. Hanbury, F.L.S., Pharm. Journ. N. S. viii. p. 651.)

There is no difference to be discerned between the Irish and American tubercles, and the concentric dark circles seen on a cross section are similarly loaded with resinous points. Some of them attained to a considerable size, and the weights of three of the largest specimens before being dried, with the root branches attached, were 12 oz., 10½ oz., and 8 oz. respectively.

The examination of the jalap was conducted almost in a similar manner as in the case of the podophyllum. The dried powdered root was macerated for twenty-four hours in alcohol sp. gr. 0·84, and afterwards thoroughly percolated. When the resin was precipitated by water it fell down as a tenacious yellowish clot, which adhered to the bottom of the beaker, and, as it was impossible to filter it, the supernatant fluid was drawn off, and the resinous cake dried at a gentle heat. The weight obtained corresponded to 11·97 per cent. The film of resin, when broken up, formed greenish-yellow lustrous scales with a strong odour, though the resin, as usually met with, is in dark-brown opaque fragments or in powder.

I owe another analysis of jalap to my friend Mr. Tichborne. From his analysis it appears that 1 lb. 5 oz. 100 grs. of the moist tubercles gave, after drying, 6 oz. 200 grs. of dry root. The percentage of pure resin which he obtained was not so high as the above, being but 9·2 per cent; but this difference is probably in part owing to the roots he operated upon not being so thoroughly dried as mine, which were carefully desiccated under the air-pump as well as by artificial heat.

Now, as the proportion of resin to the other constituents of the root varies considerably, different chemists giving it as from 10 to 19 per cent., the quantity yielded by the specimen in question is fair, and is perhaps lower than it might otherwise have been, owing to the continued drought of the past summer, for jalap, as we have seen, loves a damp soil.

As regards the physiological action of the root, I can, at present, only put forward the following observations:—

December 7th.—I took 2 grains of the resin before breakfast. A good deal of flatulence was caused, but no decided cathartic effect.

Dec. 9th.—I took 3 grains before breakfast. Slight action in one and a half hours, copious loose stools in two and a half hours.

By the permission of Dr. Head, I hope soon to have further opportunities of testing the activity of the drug in the wards of the Adelaide Hospital.

Professor Bentley said that everything relating to the conditions favourable to the growth of medicinal plants could not fail of exciting the interest of all there present, and he was glad of the opportunity that had been afforded him of reading Dr. Smith's interesting communication. Dr. Smith had given a very full and perfect account of the climatic conditions necessary for the growth of both the podophyllum and jalap plants, but unfortunately his experiments related chiefly to podophyllum, the cultivation of which was not nearly of so much commercial importance as that of jalap, inasmuch as it might be successfully carried on over a very large area of country in America, so that there was no par-

ticular necessity for growing it at home. He should look forward with interest to Dr. Smith's further experiments upon the growth of jalap, of which there was a deficient and uncertain supply; and the past summer having been so exceptional in its atmospheric conditions no general conclusions could safely be drawn from experiments in its growth in that year only. He feared, however, that but little success would attend its cultivation in the United Kingdom.

Mr. HANBURY produced some specimens of jalap grown near London, but said he believed his roots were of less size and more watery than those obtained by Dr. Smith. There was great difficulty in finding in Europe a climate suitable to the growth of this plant, which appeared to flourish only on the Mexican Andes. Its cultivation had been attempted in the south of France, but the result was a complete failure, the plants being evidently totally unsuited to so dry a climate, whilst in England the summer did not generally last long enough for the plants to flower. Last summer, notwithstanding the great heat, his plants did not produce a single flower. He did not know of any part of the world except some parts of India where the cultivation could be introduced with much hope of success. He had not ascertained the percentage of resin in his roots, but they appeared to have a very saccharine smell,—more so even than that from Tampico. He might remark that the mode of drying the roots in Mexico imparted a peculiar smell to them; the tubercules were hung up in a net from the roof, where the smoke from a peat fire curled round them, and occasionally a piece would be found quite scorched.

ON THE DETECTION OF METHYLIC ALCOHOL.

BY JOHN T. MILLER.

It is desirable to be able to detect with certainty *small quantities* of methylic alcohol in presence of spirit of nitrous ether. If for this purpose we employ the oxidation test, after merely shaking the spirit with carbonate of potassium, very little reliance can be placed on the indications, as was shown by Mr. H. N. Draper, who, it will be remembered, failed in two instances to arrive at correct conclusions by this process.

After trying in several ways without success to overcome the difficulty, which is most marked when the samples under examination contain much nitrous ether, etc.,—I at last obtained satisfactory results by preparing the spirit for oxidation in the following manner:—

Shake about an ounce of the sample with 20 or 30 grains of anhydrous carbonate of potassium, and, if needful, add fresh portions of the salt until it ceases to be dissolved, then pour off the supernatant spirit. This serves to neutralize acid and to remove water, in which some samples are remarkably rich. Introduce half a fluid ounce of the spirit into a small flask; add 150 grains of anhydrous chloride of calcium in powder, and stir well together; then, having connected the flask with a condenser, place it in a bath of boiling water, and distil a fluid drachm and a half, or continue the distillation until scarcely anything more comes over. The operation is rather slow, but needs little attention, and should be done thoroughly. The distillate contains nearly the whole of the nitrous ether and other interfering substances. Now add to the contents of the flask a fluid drachm of water, and draw over the half drachm of spirit required for testing. Add it to the usual oxidizing solution composed of 30 grains of red chromate of potassium, 25 minims of strong sulphuric acid, and half an ounce of water; let the mixture stand a quarter of an hour, then distil half a fluid ounce. Treat the distillate with a slight excess of

carbonate of sodium, boil rapidly down to two fluid drachms, and drop in cautiously enough acetic acid to impart a faint acid reaction; pour the liquor into a test-tube about three-quarters of an inch in diameter; add two drops of *diluted* acetic acid, B. P., and one grain of nitrate of silver in half a drachm of water; then apply heat, and boil gently for two minutes. If the spirit is free from methylic alcohol the solution darkens, and often assumes transiently a purplish tinge, but continues quite translucent, and the test-tube, after being rinsed out and filled with water, appears clean or nearly so. But if the spirit contains only 1 per cent. of methylic alcohol the liquid turns first brown, then almost black and opaque, and a film of silver, which is brown by transmitted light, is deposited on the tube. When the sample is methylated to the extent of 3 or 4 per cent., the film is sufficiently thick to form a brilliant mirror. To ensure accuracy, the experiments should be performed by daylight.

Lastly, I invite attention to the following facts:—

A few weeks back a gentleman sent me for examination a specimen of some spirit of nitre which, wrote he, "was sold to a customer of ours at 2*s.* 4*d.* per pound, less 5 per cent. discount. Gravity, I understand, is ·850. Of course it can't be done at the price and be right."

And right it was not, as the naphtha-like odour developed on shaking a few drops with tepid water and the fine mirror obtained on testing it conclusively showed. I have since examined ten other samples, of which four proved to be strongly methylated. It appears, then, that there are men among us—probably not a few—who do not scruple to violate the Excise law. How much longer the authorities will allow this to be done with impunity remains to be seen.

Sheffield, December, 1868.

The CHAIRMAN said this seemed a subject of some importance, for sweet spirits of nitre was adulterated with methylated spirit to a considerable extent, although of course a heavy penalty attached to the perpetrators of such a fraud. There was no doubt, however, that the spirits of nitre was sold at a price which would not remunerate the manufacturer if duty-paid spirit were used.

Mr. HANBURY asked whether it was considered that the law was sufficiently stringent, if put into force, to prevent the use of methylated spirit for making pharmaceutical preparations, such as the one under notice.

The CHAIRMAN said there was no doubt about its use being illegal for anything but external use.

Mr. MORSON said its use was absolutely forbidden for making sweet spirits of nitre.

Dr. REDWOOD said that methylated spirit might be used for making ordinary ether, and also for chloroform, because in these cases the product was practically as good for ordinary purposes as that made with the best alcohol. In the case of sweet spirits of nitre, however, if methylated spirit was used, it not only contributed to the production of the ether, but also became the solvent of it, methylic alcohol with its impurities remaining present in the product. The authorities connected with the Pharmaceutical Society, and commissioners who originally advised with the excise officers of the Government previous to the introduction of the law which legalized the use of methylated spirit, protested from the first against its being allowed to be used for making sweet spirits of nitre, as well as other medicinal preparations where the spirit with its impurities was retained as part of the product. It was, therefore, highly important, in the interests of pharmacy, that the existing state of the law should be maintained to the fullest possible extent, and that they as a Society, and every individual connected with it, should endeavour by every means to frustrate the attempts made to introduce the use of methylated spirit in the preparation of this and other substances intended for internal use.

CHERRY-LAUREL WATER.

BY C. UMNEY, F.C.S.

The introduction into the British pharmacopœias of 1864 and 1867 of aq. laurocerasi has had a marked effect upon the consumption of this preparation, the demand being now at least two or three times greater than it was five or six years since.

It has been long known that in strength, and therefore in dose, this water is liable to considerable variation; but, as far as I am aware, no examination of the various waters as found in pharmacy, purporting to be of the "officinal strength," has been published, neither has any suggestion been made to remedy the evil of the varied proportion of its poisonous principle. With a view, therefore, to obtain uniformity in strength and action of this medicine, these experiments were made. The 'British Pharmacopœia' directs us to take—

Fresh cherry-laurel leaves	1 pound.
Water	2½ pints.

Crush the leaves, macerate them in water for twenty-four hours, then distil one pint.

The compilers of the Pharmacopœia have here adopted the directions of the 'Dublin Pharmacopœia' in the maceration of the leaves for twenty-four hours previous to distillation, and have rejected the Edinburgh process of immediate distillation, and the colouring of the distillate by comp. tincture and lavender. *En passant*, it must be queried whether this maceration is beneficial, or whether it is not rather prejudicial to the distillate, as it has been shown that the leaves of cherry-laurel contain principles analogous, and that react upon each other, as do those in the bitter almond, *i. e.* an azotized body (amygdalin) is acted upon by a ferment (emulsion), and instantly essential oil, prussic acid, sugar, and formic acid result. This same reaction, or a modification of it, doubtless takes place on the addition of the bruised cherry-laurel leaves to water, or even when the leaves are smashed thoroughly alone, for the 65 per cent. of water they contain when fresh is quite sufficient to develop the reaction when the cells of the leaf are destroyed.

Those engaged, or who have had any experience, in the distillation of essential oil of almonds well know that the longer the almond, when thoroughly disintegrated, is in contact with water, the less is the product in the distillate of essential oil, as water is very favourable to the oxidation of the oil into benzoic acid.

As the oil of cherry-laurel is the same in constitution, if not in composition, as bitter almond oil, which it resembles in almost every respect, save the proportion of hydrocyanic acid it contains (which, in the specimen I examined, did not reach 2 per cent.), it may naturally be inferred that the product, after distillation with previous maceration, is deteriorated in value of essential oil, although, perhaps, not to an appreciable extent in prussic acid.

Many experiments which I have made at intervals during the last eighteen months show that immediate distillation of thoroughly bruised leaves, as soon as in contact with water, gave always a distillate superior in fragrance and equal in hydrocyanic acid, and, in some cases, slightly in excess of the latter, to those made after twenty-four hours' maceration.

The main point, however, to which I would direct you is one of more importance,—the percentage of hydrocyanic acid obtained from leaves distilled at different periods, and the variable state of the cherry-laurel waters as found in pharmacy at the present time.

In distilling various specimens, I have always operated on leaves absolutely fresh, and not after having been kept a week or two, as some change takes place

by which the product, in hydrocyanic acid value, is less than half when similar leaves are used fresh; distillation, too, has always been effected by steam-heat of a temperature of about 235°, the rapidity or slowness at which distillation is carried on, having, doubtless, an effect upon the distillate.

The three periods at which I have made the water have been March, July, and November; the highest strength of prussic acid being obtained in March, when it reached 1·26 grs. of real acid in 1000 grs.; the lowest in November, when it was only half the strength, ·64 grs. of real acid in 1000 grs.; the distillate of July being nearly a medium between these—1·08 grs., real acid, in 1000 grs.

The various distillates were examined from time to time; it was found they had depreciated as much as 10, and in some cases 20 per cent. of the original quantity of acid. This depreciation in value of acid by age, and variable strength of the water, as obtained from leaves at different periods of the year, led me to suppose, that if I examined the cherry-laurel water in the pharmacies in town, I should find such a difference as should not exist with such a powerful remedy, which is about one-twentieth of the strength of the dilute hydrocyanic acid of the Pharmacopœia. I found aq. laurocerasi varying as 53 does from 100, or some only about half the strength of others; in one case I found, upon obtaining a second specimen from the same source (within seven days) that water dispensed one week was but a little more than half the strength of that of the previous week.

Such discrepancies as these ought not to be found, and must not exist, if we wish to have uniformity in medicine, and the life of the public safe in our hands.

To be hard upon ourselves, "they manage these things better in France," for I have found that the Codex directs that the leaves should be gathered from May to September, that the distillation shall be conducted immediately (10 per cent. less leaves being added than in our formula), that the product shall be examined and brought to a uniform strength of 50 millegrammes in 1000 c. c. In this respect, therefore, we might surely with advantage imitate the French, presuming it is absolutely necessary that we should have such a preparation officinal; if not, resort to the 2 per cent. solution of hydrocyanic acid, which now is always to be had definite, I trust, and if required to be made more grateful, there are doubtless many harmless aromatic waters that will admirably answer the purpose.

To the medical practitioner, however, this change must be left; the allusion on our part to the uncertainty of the strength of this preparation, is all that becomes us as purveyors of medicine.

Laboratory, 40, *Aldersgate Street, E.C.*

Dr. Redwood thanked Mr. Umney for contributing this paper, and desired to express his concurrence with most of the statements made in it. He looked upon cherry-laurel water, as an article of pharmacy, in the light of an abomination; he always had viewed it in that light, and had always protested against its being retained in the Pharmacopœia; but he had been met by the statement of medical men that they had been accustomed to use it, and whatever chemists might say about the variableness of its composition, they had found certain advantages attach to its use, and wished to be allowed to use it. To such a statement, what answer could be made? He had long ago obtained results similar to those described by Mr. Umney, and had fully satisfied himself that cherry-laurel water was a most uncertain and variable preparation. They had been told, however, that great value was attached to it on the Continent, and also that those who had used it in this country had found a benefit from it which they had not experienced in the use of hydrocyanic acid, and they were also

reminded that there were many preparations used in medicine of a not very definite nature, which sometimes were found to answer the purpose of the physician better than those which were more definite. In reference to this very article, he had been reminded of the difference that existed between the preparation which was introduced many years back under the name of chloric ether, and that which was now considered a more definite and uniform representative of it under the name of spirit of chloroform. The old chloric ether differed probably from the present spirit of chloroform to about the same extent and somewhat in the same way that cherry-laurel water differed from dilute hydrocyanic acid. The one was of a definite and uniform strength, and a perfectly comprehensible preparation, and the other was an indefinite mixture of variable products, which were administered in an unpurified state. There were, however, those who still held to the old chloric ether, as being preferable to the spirit of chloroform. One was an unpurified preparation made by simply distilling spirit of wine and chloride of lime together, when the spirit came over as a spirituous solution of chloroform with the ordinary impurities. It contained something more than chloroform; it might be as highly charged with something analogous at any rate to chloroform as spirit of chloroform would be, but instead of being easily separated by admixture with water, it was not so; and this was one advantage it possessed. That was one case, and there were many others of the same kind. At their previous meeting Dr. Attfield had said in reference to a certain preparation of opium, that if the efficacy of opium depended on morphia, why did not physicians use a solution of morphia, and have something perfectly definite in form. That was a very short cut made to attain to what theoretically appeared certainly a correct and satisfactory mode of proceeding, but it was not a method that would generally meet the views and requirements of the medical profession. They would say that if you took morphia or any of its salts, and if they took a certain preparation of opium, and administered them, they found perfectly distinct and different results. In like manner with quinine, which was a definite preparation of cinchona bark; they could prepare sulphate of quinine perfectly pure, and could make a solution of it, the composition and strength of which they could tell precisely, but nevertheless, there were medical men who would take certain preparations of the bark, which they said produced effects different from those of sulphate of quinine. While this was the case they must admit the superior knowledge of medical men, and endeavour to provide those preparations which were required by the profession. It was in this spirit only that they were disposed to permit such a preparation as cherry-laurel water to remain in the Pharmacopœia; although he was free to confess that there were stronger arguments against its retention than applied in the other instances he had mentioned.

Dr. Attfield remarked that they appeared to be entering on the very large subject of therapeutics. There were not three medical men in the country who were working at therapeutics in anything like a scientific manner, and he did not attach much value to the statements on such matters by ordinary practitioners. He had no doubt that opium and its various preparations would go the way of cinchona bark and its preparations in due time, and morphine, quinine, and definite mixtures of definite principles alone be employed. With regard to the subject of the paper which had been read, it was only due to a gentleman well known to all the members, to say that it had been very well worked out some three or four years ago by Mr. Draper, though Mr. Umney had carried the subject much further, and thanks were due to him for his communication. Mr. Draper suggested that cherry-laurel water should be made by putting into water a definite quantity of hydrocyanic acid, and then adding some oil of cherry-laurel, or else that it should be always freshly prepared and standardized in the manner adopted in the Pharmacopœia with reference to dilute hydrocyanic acid.

Mr. HANBURY would deplore another definite solution of hydrocyanic acid being introduced, and would rather allow the cherry-laurel water to retain its place, with all its uncertainty, for those who wished to prescribe it. Those who wanted a definite solution, could adopt the one already provided in the Pharmacopœia.

NOTES ON CITRATE OF QUININE.

BY PROFESSOR ATTFIELD.

The following prescription was recently brought to me by Mr. W. Young, Pharmaceutical Chemist:—

℞	Quiniæ Sulphatis	gr. viii	
	Acidi Citrici	ʒi	
	Potassæ Citratis	ʒi	
	Aquæ ad	ʒviii	Misce.

He stated that on mixing the several materials a similar result was not always obtained. Occasionally the patient said the medicine was clear and bright, and remained in that condition so long as it was under observation. At other times it was clear when made, but after a day or two a layer of small crystals covered the bottom of the bottle to the depth of a sixteenth or an eighth of an inch. Frequently it was turbid when prepared, yielding, on standing, a white, "chalky" sediment, varying in thickness up to half an inch.

The first point for consideration in this case was the nature of the precipitate; second, the conditions under which it was formed. Reflecting that the constituents of citrate of quinine were present, and that the solubility of that salt in cold water is very slight, it was natural to suppose that citrate of quinine was the body precipitated. Analysis confirmed this view, and, moreover, showed that the precipitate was nothing but citrate of quinine,—showed that nothing like a double salt of potassium and quinine was formed. Citrate of quinine has been stated to be soluble in 820 times its weight of cold water. Eight ounces of water will therefore dissolve $4\frac{1}{4}$ grains. But the 8 grains of sulphate of quinine ordered in the prescription will yield $8\frac{1}{3}$ grains of citrate, half of which will be precipitated if the sulphate of potassium formed, or free citric acid present do not increase its solubility. This was about the amount of insoluble precipitate which the mixture yielded at the average temperature of 60° F. The temperature which, doubtless, is meant when the statement is made that citrate of quinine "dissolves in 820 parts of cold water" (Gmelin's 'Handbook of Chemistry,' Cav. Soc. Trans. vol. xvii. p. 292), for on making up the mixture when the temperature of the materials was about 40° F., 94 per cent. of the citrate of quinine was precipitated, the clear liquid having very little bitterness. On the other hand, when the temperature was 70° F. the ingredients could be so mixed as to yield no solid citrate of quinine for two or three days. This leads to the consideration of the conditions under which the precipitate is formed. Temperature chiefly contributes to the result, but the method of mixing produces important influence. Thus, if the sulphate of quinine and citric acid be placed in the 8-ounce bottle with most of the water, and the citrate of potash, dissolved or undissolved, be added last, a mixture will be obtained possessing the merit of brightness and clearness, but giving sooner or later, according to temperature, a crop of acicular crystals which sometimes adhere to the glass, and, therefore, do not admit of diffusion by shaking, and which, besides, may be sufficiently large and heavy to interfere with the fair apportionment of the dose of quinine on pouring the mixture into a measuring-glass or spoon. If the three solids be placed in the bottle, and water gradually

added, some citrate of quinine remains undissolved, but most of the solid matter goes into solution, and, after a time, citrate of quinine is sometimes deposited in minute crystals on the sides of the bottle. Lastly, if the solids be rubbed together in a mortar with a few drops of water for a minute or two, and the rest of the water be then gradually added, a mixture will be obtained which certainly is not clear, and the aqueous portion of which will probably not be saturated with citrate of quinine for several hours—for citrate of quinine is one of those substances which do not readily redissolve in water—but which will always have the same appearance when dispensed, and the citrate of quinine of which, being wholly formed at once in the mortar, will be less likely to deposit on the sides of the bottle than when produced after the materials are mixed in the bottle. This third method of admixture is, then, that which the dispenser would probably select.

These experiments with citrate of quinine afforded an opportunity of clearing up one little point connected with the composition of the salt,—so far, that is, as its water of crystallization is concerned. The formula commonly accorded to citrate of quinine is,—

$$(C_{20}H_{24}N_2O_2)_2, H_3C_6H_5O_7, 5H_2O.*$$

$5H_2O$ requires, however, 9·68 per cent. of water, whereas in the published analyses 10·6 is the amount said to have been obtained. On drying a quantity of the pure crystals in a water oven, I found 9·77 per cent. of water had been expelled. This is very near the proportion demanded by theory, and confirms the accuracy of the stated formula.

The CHAIRMAN remarked that he believed some of the difficulties alluded to by Dr. Attfield were experienced in the making of quinine wine; sometimes it would be quite bright, and at other times a change in the temperature of the atmosphere would cause it to appear cloudy.

NOTE ON AROMATIC SULPHURIC ACID.

BY PROFESSOR ATTFIELD.

A short time ago I was asked whether or not the official† aromatic sulphuric acid contained sulphovinic acid. Aromatic sulphuric acid is made by mixing gradually 3 volumes of sulphuric acid with 40 of rectified spirit, and then adding certain aromatics (cinnamon and ginger). Sulphovinic acid is also made by mixing sulphuric acid and spirit, but the volumes should be equal, the alcohol as nearly absolute as convenient, a temperature considerably above that of boiling water applied to the mixture, and the material allowed to digest together for twenty-four hours: even then the whole of the alcohol is not converted into sulphovinic acid. From these facts we should infer that sulphovinic acid is not formed to any considerable extent in making aromatic sulphuric acid. Still there is some rise of temperature in mixing 3 volumes of sulphuric acid with 40 of rectified spirit, hence the production of a small quantity of sulphovinic acid might be considered possible. To ascertain whether or not this were so, a portion of the diluted spirit was treated with carbonate of

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* C=12; O=16.

† The Pharmacopœia and all in it is official (*office*, Fr. from L. *officium*, an office). There are many things which in pharmacy are officinal (Fr. from L. *officina*, a shop) but not official. To restrict the word *officinal*, first to the contents of a pharmacist's shop, and, second, to that portion of the contents which is Pharmacopœial is radically wrong, and in future should be avoided.—J. A.

barium; the sulphate of barium separated by filtration, washed with acid and water, dried and weighed. The filtrate, which would contain sulphovinate of barium, if sulphovinic acid had originally been present, was evaporated to a small bulk over a water-bath. The weight of the sulphate of barium corresponded with that of the sulphuric acid whence it was obtained; indeed, it was apparently somewhat greater—a result due, probably, to loss of alcohol during manipulation, and a corresponding increase of strength of the diluted acid. The filtrate from the sulphate of barium finally dried up without giving any sulphovinate of barium. These experiments were repeated, after the mixture of sulphuric acid and spirit had been set aside for fourteen days, with the same result; indicating that sulphovinic acid is not formed after a time. They were also repeated after due maceration with the aromatics, but, again, no sulphovinic acid was obtained. We are, therefore, now in a position to state that aromatic sulphuric acid, when made according to the Pharmacopœia, contains no sulphovinic acid.

NOTE ON THE ADULTERATION OF PRECIPITATED SULPHUR.

BY PROFESSOR ATTFIELD.

Why is precipitated sulphur still usually adulterated to a scandalous extent with what may be termed plaster of Paris,—hydrous sulphate of calcium ($CaSO_4$, $2H_2O$)? Nearly every book on chemistry and materia medica states that instead of being made by mixing hydrochloric acid and polysulphide of calcium, it is often prepared by the reaction of sulphuric acid and the sulphur salt, the result being precipitated sulphur (identical, so far, with the official article—*Sulphur præcipitatum* B. P.), but mixed with more than an equal weight of the calcareous mineral compound, which when well dried constitutes plaster of Paris. Every chemist and druggist therefore, knows, or ought to know, that precipitated sulphur is more likely to be impure than pure. and yet the employment of the adulterated variety seems on the increase. From the following table it will be seen that out of eight samples which I recently purchased (for quite another purpose) within an area of a mile, only one was pure, one contained nearly half its weight of calcareous matter, and each of the others was actually two-thirds impurity and only one-third precipitated sulphur. In explanation of this condition of things, the statement is commonly made that the public has become so accustomed to the satiny appearance of the impure article (due to the selenitic character of the adulterant) as to regard the pure with suspicion, often refusing to purchase it. I cannot believe in the general application of this explanation. The public, surely, places too much confidence in a pharmacist's knowledge of drugs to persist in refusing a pure in favour of an impure chemical. Therapeutists cannot hope to arrive at a rational system of medicine unless the followers of pharmacy combine to crush the practice of adulteration. Precipitated sulphur is, doubtless, an exception to the general rule that drugs are less adulterated now than formerly, but clearly there is room for much improvement.

No.	Impurity in 100 parts of the "Sulphur."
1	$66\frac{3}{4}$
2	$43\frac{1}{4}$
3	$66\frac{1}{3}$
4	$66\frac{1}{2}$
5	$66\frac{1}{4}$
6	$64\frac{1}{4}$
7	pure
8	$64\frac{1}{2}$

Chemists and druggists, their customers, and medical practitioners, should refuse to purchase any precipitated sulphur which leaves a white ash when a little is burnt off on the end of a table-knife or spatula. (The sulphur does no more damage to the steel than a rub on a knifeboard will remove.)

Mr. HANBURY remarked that the only formula given in the Pharmacopœia for milk of sulphur produced this impure result.

Dr. REDWOOD said that was rather an important point. He was far from being prepared to advocate the use of milk of sulphur in preference to precipitated sulphur, but, nevertheless, when the fact of the former preparation, containing a large quantity of sulphate of lime, was brought forward as an imputation on pharmaceutists for selling an adulterated article, he must take exception to the charge, and say that he did not admit it to be an adulteration. As stated by Mr. Hanbury, the only officinal process for making milk of sulphur was given in the London Pharmacopœia of 1721, and practically produced a mixture of sulphate of lime and sulphur, which was obtained by precipitating with sulphuric acid a sulphide of calcium. It was quite possible, but by no means certain, that pure sulphur would answer the desired purpose better. As he had stated, with reference to some other preparations, it was sometimes found that an admixture of foreign matter, so far from injuring the action of a remedy, promoted its efficacy. This was said to be so with reference to the action of the resin of jalap and other medicinal substances; the intermixture of some inert material promoted the action of the medicine in certain cases; in what way he would not undertake to say, perhaps by merely separating the particles. At any rate they should be careful how they too strongly condemned a preparation, merely on the ground stated in this case, when it was well known and had been long used by the public. They had been accustomed to take a certain quantity of milk of sulphur, and to expect a certain action from it. It mixed with liquids much better than precipitated sulphur did, and he believed a large number of the public, for this and other reasons, liked it better. He did not advocate the use of milk of sulphur, much less the substitution of it for precipitated sulphur, for milk of sulphur was one thing and precipitated sulphur another. If any one supplied the former in the place of precipitated or sublimed sulphur, they would act very wrongly; but when they were asked for milk of sulphur, he could not see that they were to blame for supplying it, and, in many cases, if pure sulphur were substituted, he did not think the public would be satisfied.

Mr. BLAND said this subject had been discussed many years ago, and, as the result, he obtained some pure precipitated sulphur and retailed it, and the consequence was an almost universal complaint. Pure precipitated sulphur was with great difficulty miscible in water or any aqueous vehicle, which caused great complaint. Like many others, he had been obliged to fall back on the old preparation simply in self-defence.

Mr. HILLS was surprised to hear Dr. Redwood advocate milk of sulphur as a genuine preparation. He would remind him that by the New Pharmacy Act those who sold adulterated articles were liable to a fine.

Dr. REDWOOD considered that milk of sulphur, as usually sold, was not an adulteration.

Mr. HILLS said he did not feel at all sure of that, himself.

Mr. MORSON said milk of sulphur did not profess to be pure sulphur.

Dr. ATTFIELD was astonished to find any one connected with that Society sheltering themselves in the matter of adulteration behind either custom or an old Pharmacopœia. The public knew nothing about the old Pharmacopœia, or how the article was made, or what it was professed to be; if they asked for sulphur they expected to get sulphur. "Milk of sulphur" was simply the

popular name for the official preparation, and he was quite sure that purchasers, in using that name, did not know they were liable to be supplied with an article of which considerably less than half was sulphur. He maintained, as a matter of common sense, that an article which contained two-thirds of its weight of impurity was scandalously adulterated.

Mr. HOOKER said that when he started in business some years ago as chemist in a provincial town, he determined to sell only pure drugs, and, accordingly, procured pure precipitated sulphur, which he attempted to sell instead of milk of sulphur. Some of his best customers, however, refused to have it, saying they had always been accustomed to get a good article, and did not like to have anything different. It was in vain for him to explain the case to them, and at last he was compelled to revert to the old-fashioned article. He should like to know what a druggist ought to do under such circumstances.

Mr. HILLS said that in the establishment which he represented, nothing but pure precipitated sulphur was sold, and he would rather sell none at all than supply an adulterated article.

Dr. REDWOOD said that principle was quite correct if they sold it under the name of precipitated sulphur, but what he contended for was, that the two things were quite different. Milk of sulphur was sulphur precipitated with sulphate of lime, according to the process originally given in the Pharmacopœia; it had long been in general use, and he did not consider it was any adulteration whatever to sell under its distinctive name a preparation which had been found advantageous. With the same reason, they might complain of any preparation in the Pharmacopœia which contained something more than was expressed by the name it bore, as an adulteration. For instance, tincture of senna contained something besides senna, but it could not be considered an adulteration.

Dr. ATTFIELD asked, if milk of sulphur was a good preparation, why was not the process given for it in the London Pharmacopœia retained in the present one?

Dr. REDWOOD said he did not advocate the use of milk of sulphur, and should be glad to see it superseded by precipitated sulphur, which was more definite; but, as he had before remarked, there were practical difficulties in the way. One was the greater facility there was in mixing milk of sulphur with water, and he had been told, although he was not prepared to vouch for the accuracy of the statement, that those accustomed to take milk of sulphur found that it possessed greater efficacy, as a medicine, than pure sulphur without the addition of any sulphate of lime. At any rate, he had not medical authority to repudiate such a statement.

Mr. WOOD said he had frequently taken milk of sulphur, but could not take precipitated sulphur.

Mr. MARTINDALE said the process was first introduced in the London Pharmacopœia in 1721, and the preparation was there called *lac sulphuris*, which name had ever since been retained for that particular preparation.

Mr. HANBURY thought, in the Pharmacopœia in which it was ordered, the process was given in ignorance. He was far from advocating the use of this calcareous sulphur, which he considered an abomination, and did not think there could be so much difficulty in introducing a pure article as some gentlemen seemed to suppose. In the house in which he was a partner, there had not been any so-called milk of sulphur for a long time. They always used pure sulphur, and never found any complaint.

A MEMBER said when a customer went to a chemist he trusted to him to supply him with a pure article; he did not know the difference between milk of sulphur and pure sulphur.

The CHAIRMAN thought the public judged in such matters very much by what they had been accustomed to receive, and if they had been used to an impure article, they would prefer it to the genuine.

Mr. MORSON said milk of sulphur was an old preparation, which was literally a mixture of sulphur and sulphate of lime, and the subdivision of the sulphur by this means did, no doubt, influence its action. If any one asked for pure or precipitated sulphur, they should get it; but milk of sulphur was a different thing, which they also had a right to get if they wished for it. He recommended them to keep both articles, and supply whichever was wanted.

SPECIAL MEETING.

A Special General Meeting of members was held on Thursday, January 14th, at the Society's house, Bloomsbury Square, W. Sandford, Esq., President, in the Chair, for the purpose of considering the amended Bye-laws.

The SECRETARY read the notice convening the meeting, as it appeared in the Journal of last month.

The CHAIRMAN said he presumed all the members present had read the proposed Bye-laws, as they had been published in the Journal for that purpose; the only alteration since made being to restore the words, "not less than one clear day prior to the day on which the election is to take place," with reference to the transmission of votes by persons who did not vote personally. These words had been restored under the advice of their solicitor, because they were the words of the Act of Parliament. They had imagined it would be a convenience in many cases if they said "at any time prior to the election," so that the voting-papers be received by the Secretary previous to the election, as there might be London members who, at the last moment almost, might find themselves unable to attend, although they had intended to do so. It was found, however, that the Act of Parliament expressly said, "such voting-paper being transmitted under cover to the Secretary not less than one clear day prior to the day on which the election is to take place;" and as the transmission was not complete until the voting-papers were received, it was necessary to restore those words in the instructions for voting. With that exception there had been no alteration in the bye-laws as published in the Journal. The general alterations which were required for carrying into effect the New Pharmacy Act were made and approved by the meeting held in October; but when those alterations were submitted to the Privy Council, several alterations were suggested, some being verbal. For instance, they did not like the wording in the first clause of the fifth section as to the persons going out of office in each year, which they considered rather ambiguous, and a verbal alteration was accordingly made, but leaving the sense the same as before; two-thirds of the members of council were to go out each year, seven being those who were lotted in the previous year, and the other seven to be taken by lot from the remaining fourteen. No important alterations were made up to Section X., and then, having regard to the important work which the Society would be called upon hereafter to perform and the relation in which it would stand to the public, they tried to improve the constitution of the Board of Examiners. In the first place they put a limit as to the age of examiners, the fifth section being as follows:—"After the first day of January, 1871, the Council shall not appoint any person who has attained the age of 65 years at the time of appointment to be an examiner, unless such person shall be the President or Vice-President of the Society." The next alteration was in the next clause:—"After the first of January, 1871, no person shall be appointed an examiner who at the time of appointment is, or who, during one year prior to the time of appointment, has been a member of the Council, other than the President or Vice-President, and the election of any Examiner to be a Member of the Council shall vacate his

appointment as an Examiner." That was really an important alteration, but he believed it was one which in principle was right. Then there were words added at the end of the ninth clause, requiring the Secretary to give notice to the Privy Council of the examinations. That, of course, was a matter of necessity. In the eleventh clause the words "according to the bye-laws in force" were added, and in the fourteenth there were words added as to the modified examinations, that persons presenting themselves should pass such modified examination as should be declared sufficient evidence of their skill and competency. Those were the only material alterations. In the seventeenth section there was an alteration suggested by the Privy Council as to the expulsion of members. It originally stood that if any report were made to the Council by a member of the Society in writing, that another member or any associate had been guilty of any act or conduct which, in the opinion of the Council, was contrary to, or subversive of, the interests of the Society, certain steps should be taken. Now it stood,—"If the council be of opinion that the alleged act or conduct is of such a character," then such-and-such steps should be taken. Four examiners were to be a quorum in Scotland, and four examiners were declared necessary to sign certificates. The Board of Examiners was not to consist of more than twelve or less than eight persons in England, and of not more than eight or less than four in Scotland. Those were the principal alterations, and he would now therefore move,—"That the bye-laws, whereof formulæ have been prepared and confirmed by the Council, and submitted to this Special General Meeting, be confirmed and approved as the bye-laws of the Society, and take effect from the date of the confirmation and approval thereof, as required by the statute now in force."

Mr. Dickinson said the principal alteration made by the Privy Council appeared to be with regard to the Board of Examiners. It was an important principle, but he agreed with the Chairman in thinking it right in principle. He wished, however, to know if they laboured under any disability in consequence of the bye-laws not having yet been confirmed by the Privy Council, as he had understood from the Chairman, at the meeting in October, would be the case if they were not confirmed by the 1st of January.

The Chairman said there was this disability, that they could not elect any new members until the bye-laws were settled, and there were several persons who wished to be elected now, who had been chemists and druggists in business for themselves before the passing of the Act of 1868.

Mr. Dickinson said, from conversations which he had had with several persons in the business, he had expected a much larger attendance, and that there would have been some discussion as to the provisions of the new Act. He heard on all sides that it was most difficult to understand the working of the new Act. As far as his experience of more than twenty years went, their business was made more difficult to conduct every year, and now they had this new Act, which interfered with them still more. He had hoped that some of these gentlemen who had spoken to him would have been present, and would have stated their difficulties, particularly with regard to understanding the Schedule. He understood that Lord Robert Montagu had given notice of a motion with regard to the Pharmacy Act, but he was not acquainted with its nature; but he had no doubt, from the great experience of that gentleman on the Council, that if any great difficulties were found to exist in the working of the Act, they would be removed in good time. He was sorry that so little interest was taken in the matter, but it was generally the way that men did not think of bestirring themselves before they felt the burden on their shoulders.

The Chairman said he was not in a position just then to say anything about the Schedule, but he had no doubt that things would settle down quietly, and that there would be no difficulty whatever in the working of the Act.

Mr. DEANE said that was also his opinion. Hitherto he had endeavoured to carry out the spirit of the Act, and had found no difficulty; but, at the same time, he had no doubt that in some country places, and even in some parts of London, there would be a considerable difficulty with regard to certain things that came under the denomination of poisons. However, with the endeavour which he believed was being made, to come to some understanding with the Privy Council, he had no doubt that things would be made smooth, and that the new Act would not be found so burdensome as some people seemed to apprehend.

Mr. WILLIAMS said he should be happy to second the motion from the chair, if it were necessary.

The motion was then put and carried unanimously.

Mr. DICKINSON moved a vote of thanks to the Chairman, which was carried and briefly acknowledged, and the meeting then separated.

PHARMACEUTICAL SOCIETY, EDINBURGH MEETING.

A meeting was held in St. George's Hall, on Friday evening, 8th January, at nine o'clock; Mr. AINSLIE, President, in the chair. There was a very full attendance.

A paper was read "On the Results of some Recent Discoveries relating to the Chemistry of the Blood, and the action of Poisonous Agents upon it," by Arthur Gamgee, M.D., F.R.S.E.

Dr. Gamgee illustrated the subject by various spectra, diagrams, and microscopes. In consequence of the unexpected illness of Dr. Gamgee, a full notice of this interesting paper is unavoidably postponed until next Journal. A very cordial vote of thanks was tendered to Dr. Gamgee by the Chairman, seconded by Mr. Aitken, and carried with acclamation.

The following remarks "On the Residue of Opium after making Tinctura Opii," by Mr. William Robertson, Druggist, Elgin, was read by the Secretary:—

"In making the ordinary tinctura opii, the question has often occurred to me,—Is the opium used in the process completely exhausted of its morphia? With the view of satisfying myself upon the point, I preserved the refuse obtained at various times in making the tincture, until I had acquired, in a perfectly dry state, two pounds avoirdupois. I am quite unable, from positive data, to say how much solid opium this quantity represents, but estimating inferentially, my calculations lead me to set it down at five pounds six ounces avoirdupois.

"From recent experiments, I find that six ounces of opium used in making eighty ounces of the tinctura, according to the Pharmacopœia, left of insoluble residue two and a quarter ounces. Hence five parts are soluble and three insoluble in proof spirit.

"I operated upon the whole two pounds of dry residue,—adopting the process of the P. B. for obtaining morphiæ hydrochloras,—the result is that I have obtained forty-eight grains of morphiæ hydrochloras. The percentage is small, but it is none the less satisfactory. Taking the quantity of opium as above computed, at five pounds six ounces, the yield of morph. hydrochl. is somewhat more than one grain and a quarter in the thousand, or, in the dry state in which I used it, three grains and one-seventh."

Mr. NICOLL and Mr. YOUNG stated to the meeting that they understood it had long been the custom of many to accumulate the residue, and, from time to time, proceed to recover the morphia left, after exhausting for tinctura; but their impression was that, unless in times of high prices of opium, such as the present, the trouble spent in obtaining the small quantity of the alkaloid scarcely repaid the manipulator.

After an intimation as to proposed evening classes for Pharmacy the meeting adjourned.

PROVINCIAL TRANSACTIONS.

LIVERPOOL CHEMISTS' ASSOCIATION.

Fifth General Meeting, held December 10th, 1868; the President, Mr. J. Robinson, in the chair.

Mr. Jonathan Slater, 7, Church Street, was elected a member of the Association.

Mr. SHAW remarked, that spermaceti ointment, prepared according to the B.P., was sometimes considered too soft.

Mr. CHARLES JONES exhibited a substance composed of three parts sand and one part sulphur, used instead of lead for setting iron in stone.

Mr. TATE and other members mentioned the use of such a compound or sulphur alone as being known to them.

Mr. BIRD then read a paper on "Whales and Whale Fishing, and the Products Obtained." He stated that there are a very large number of species of whales, of which the most important are,—the sperm whale, which yields sperm oil, spermaceti, and ambergris; the Greenland whale, which gives the best whalebone and the most blubber, but which is now becoming scarce; the Humpbacked whale, and the Rorqual, which was the one with the capture of which he was personally acquainted. This whale, of an average length of seventy to ninety feet, does not yield so much blubber as the Greenland whale, and the whalebone is much shorter. It has only been captured of late years, as, owing to its great strength and swiftness, it cannot be caught by the old method of harpooning. The new method, consisting of the use of a rocket-harpoon with explosive shell, which sometimes kills the animal at once, was described, and the harpoon exhibited and its use explained. The blubber is stripped off spirally from the body of the whale. The lecturer looked upon the blubber rather as a store of food in time of scarcity of the minute animals on which the whale feeds, than as a preservative against cold. The various methods of extracting the oil were then given, viz. the putrefactive method, principally used by the Scotch whalers; the dry pot method; and a new steam process, which he highly recommended, as yielding more oil, of a more pleasant odour and higher lubricating power. The average composition of blubber was given as—

Oil	62·0.
Gelatine	11·5.
Water	26·5.

The oil on cooling becomes thick, it is pressed in bags, giving a solid fat used for sheep-smearing and soap-making, and an oil known as train oil. The nature and uses of whalebone were mentioned, and the lecture concluded with an account of an attempt to utilize the gelatine in making glue, which, though of good quality, would not sell well, owing to its unpleasant smell.

The lecture was well illustrated by drawings and specimens, and was highly interesting.

A hearty vote of thanks to Mr. Bird concluded the business of the evening.

Sixth General Meeting, held January 7th, 1869; the President in the chair.

Messrs. H. Caddy and A. Rooke were elected Associates.

The SECRETARY announced donations to the Library of the 'Pharmaceutical Journal,' the 'Chemist and Druggist,' the 'New York Druggists' Circular,' Proceedings of the Liverpool Architectural Society.

Thanks were voted to the donors.

The PRESIDENT referred to a notice of a class for the study of Latin, with especial reference to the reading of prescriptions, which was being formed at Queen's College, and expressed his gratification at seeing these facilities for study.

He then read a report of the Committee appointed to investigate the action of nitrous oxide as an anæsthetic. The report was highly favourable as to the ease of administration, time required for recovery, and its safety, but the action is too evanescent for the performance of long operations.

Mr. SHAW suggested that the difficulty of preparing and storing the gas would pre-

vent its general use. He then asked members to give their experience with regard to keeping the poison registration book, especially in cases of preparations of opium.

Mr. SYMES said that many chemists keep a nostrum book, in which they enter any medicines which they prescribe themselves. He thought that it was a pity that if a chemist made a cough syrup, containing syrup of poppies, it must either be labelled poison or made a patent medicine, and said that the Pharmaceutical Council were ignorant of the requirements of a country business.

A general discussion ensued on the question of poison registration, especially with reference to paregoric, syrup of poppies, morphia lozenges, etc., in the course of which the President stated that, to his own personal knowledge, death had been caused in four cases by paregoric.

Mr. ALEXANDER FRAZER then read, "Notes on Some of the Preparations of the British Pharmacopœia."

Several members joined in the discussion of the paper, and a vote of thanks was cordially passed to Mr. Frazer.

LEEDS CHEMISTS' ASSOCIATION.

The Third Meeting of the Session was held on the evening of December 16, 1868, at the Philosophical Hall, the President, Mr. Reynolds, in the chair.

Mr. Entwisle was elected a member.

The Hon. Sec., Mr. YEWDALL, reported donations of books to the library from Messrs. Griffin, of London, and the President, and a number of volumes purchased by a special subscription of the members, were also laid upon the table.

Mr. HARVEY then gave an address, entitled, "Thoughts on the Past and Present of Pharmacy," in compliance with a request made to him by the Committee of the Association. The address was especially directed to the Associates, and the following is an abstract of some portions of it:—

Mr. HARVEY said that it was forty years ago since he entered the ranks of the chemists and druggists as an apprentice, and then the only technical training that existed was the result of contact with their daily work. Further, those who entered upon business on their own account, trusted for success to steady conduct, application, and "business habits," and not to any accurate knowledge of drugs or the sciences treating of them. Under this state of things, the hours of business were long, viz. from 7 A.M. to 9 P.M. As to courses of lectures, there were none corresponding to the present courses on chemistry, but it is noteworthy, that a popular and amusing course of lectures upon that science was commonly given by some itinerant lecturer during each winter. Of course these were not the sort of science useful to a chemist's apprentice, and little more could be hoped from them than the arousing of a thirst for knowledge which might be slaked at other streams. Experimental chemistry, as a means of self-improvement, was a very different thing then to what it now is, for the apparatus to be used was cumbrous and too costly for the pocket of an apprentice; but now a new *régime* has been inaugurated, and it is mainly by our own work that the whole of the dispensing chemists in Great Britain have been gathered into one body, henceforth to be recognized by the State. Happily, this reform has been accomplished chiefly by our own efforts, but had it been forced upon us by the demands of society, acting through the Legislature, we should have had no right to complain, for surely society may require the proper qualification of those intrusted with an essential department of the healing art.

Our body has been invested with the privilege and responsibility of self-government, and, happily, self-government and free election prove, in the long-run, the most successful. Such an arrangement is consistent with the tendencies of our national character.

Mr. Harvey enlarged upon this topic by reference to and contrast with the paternal systems of many Continental states, giving interesting particulars of his own experience in the south of Russia last year.

The relations of the Pharmacy Act to the principle of free trade, were then considered. The soundest principle may be rightly subject to regulation. Personal freedom

is a sacred right; but the guards and fences required to ensure us its enjoyment are so many limitations upon the right itself in its absolute sense. My liberty of action must be so restrained as not to infringe upon liberty and the rights of other members of the community. So of free-trade: if its unrestricted enjoyment can be shown to be incompatible with the general welfare, it must submit to regulation, which will only limit, and not abolish, the operation of the principle. In our case, as in the analogous ones of the medical and legal professions, the free-trade principle is conserved by the unlimited admission of all who desire to enter our ranks, and who consent to the very moderate conditions imposed. One of the most striking illustrations of the power of unfettered trade is its ability to supply daily food for the wants of such a city as London, a task which we cannot conceive any Government commissariat as able to undertake. Yet here limitations are found needful, and are represented by the inspectors charged with the scrutiny of meat and fish, etc. Now, since a much larger number of citizens are able to protect themselves from being imposed upon by bad meat or fish, than can distinguish between sound and unsound drugs, the necessity for limitation in the latter case is the greater, and so is the need of protection against the evils of unlicensed pharmacy, which may arise from want of conscientiousness or want of knowledge, but more frequently from the latter than the former.

Passing from generalities to the more practical conditions of the Act, it appears primarily the duty of all to carry out its conditions in a *bonâ fide* manner, and although some of these are not free from obscurity, there is little doubt that they will be amended if found to entail any grievance. The influence of the Act upon such societies as this must be very important. They will become necessary, as bringing the intelligence and legitimate influence of their members to bear upon the common interests, and where needful, using common action. Even more important will be the educational functions which should now form an essential part of the operations of such societies. The ordinary monthly meetings of the Association have great educational value, and those who will use them will find that, as compared with isolated study, they afford a great economy of mental labour. It would be impossible to omit to speak of the tendency of such associations to promote good feeling, and a habit of acting together amongst their members.

The requirements of the Act represented by the "modified examination" appear just, although they may press rather hardly upon individuals. It is said that young men have offered themselves for these examinations who could not tell scammony from aloes, and one candidate who was asked the source of nut-galls, said they were "the fruit of the oak;" being reminded that oaks bore acorns, he replied, "Yes! but these are the berries."

Mr. Harvey then referred to the opportunities existing in Leeds for the prosecution of studies bearing upon pharmacy, alluding, first, to the excellent classes in chemistry connected with the Mechanics' Institute, and conducted by Mr. Ward, a fellow-member of this Association; also to a class recently formed by Mr. Abbott, for demonstrations and examinations in materia medica. Why should not these operations be expanded until a School of Pharmacy in Leeds became an established institution? Thus, many facilities already existed for acquiring that reasonable amount of knowledge demanded by the examinations for assistants, and the shortened hours of labour gave the opportunity for using these facilities. It was not so forty years since, for then he recollected a physician calling at 9 P.M., and expressing surprise at finding the shutters were being closed "so early."

The address concluded by an earnest appeal to young men to form such habits only as were compatible with a life of future usefulness, and the upholding of a competent position in the honourable calling upon which they had entered.

Mr. THOMPSON moved the cordial thanks of the meeting for the excellent paper to which they had listened. His experience agreed very forcibly with that of the author of the paper, in teaching him that youth was the seed-time of life, and that its harvest was mainly dependent upon the habits which were formed in the earlier of those seasons. He was much impressed with the purpose of the address, to bring before their younger brethren the self-rewarded duty of being something higher than merely traders in drugs.

Mr. SMEETON, in seconding the vote, referred to the address given by Mr. Harvey when

elected first President of the Association six years ago, the high tone and forcible ideas of which had impressed his mind ever since. It was not at all the least of the merits of the present paper, that it recognized the duties of the man as higher and more elevating than depended on the technical obligations of his calling.

Mr. HORSFIELD moved, Mr. BROWN seconded, and Mr. YEWDALL supported a motion requesting Mr. Harvey to allow his paper to be printed *in extenso*, which was heartily carried.

MEETING OF CHEMISTS AND DRUGGISTS IN NEWCASTLE.

On Monday, January 11th, a large and influential meeting of the chemists and druggists of Newcastle and the surrounding towns was held in the Lecture Theatre of the Newcastle College of Medicine, Neville Hall, Mr. J. W. Swan in the chair, "to consider the best means of providing facilities for the acquisition of the technical education rendered imperative by the passing of the new Pharmacy Act."

The Chairman, in opening the proceedings, drew attention to the important influence the Act would ultimately have in improving the educational qualifications, and consequently the social standing of those who were entrusted with the responsible duties of chemists and druggists, and pointed out the desirability of making some special provision for bringing up the apprentices of the present day to the required standard of knowledge, and of meeting the even greater requirements of the future.

Mr. B. S. Proctor, local secretary of the Pharmaceutical Society, then moved "That the members of the drug trade here assembled feel it incumbent upon them to promote, as far as possible, a systematic course of technical education among the rising race of chemists and druggists." He remarked that the new Pharmacy Act, which was designed for the public good, would also have a beneficial action upon the dispensers of medicine as a class, and urged that it was the duty of the present chemists to do their utmost to supply the public with a better qualified race of tradesmen as their successors.

The resolution, having been seconded by Mr. Brockett, was carried unanimously.

Mr. H. B. Brady moved the second resolution, "That a committee of four or five be appointed to confer with the Council of the Newcastle College of Medicine, and, if practicable, to agree with them for such a modification of their arrangements as will meet the wants of pharmaceutical students." He said that though they had no official communication from the College, they had reason to know that the Council would not be unwilling to receive a deputation such as that indicated in the resolution; and he strongly recommended this application, as being incomparably the best movement the meeting could take.

The resolution having been seconded and briefly supported by Mr. W. Owen, a general discussion followed, in which various matters of detail were considered, the principal speakers being Messrs. Noble, Mays, and Hudson, of Shields; Mr. Marecco, of the College of Medicine; Messrs. Fairs and Proctor, and the mover and seconder of the resolution, which was ultimately passed unanimously.

It was then moved by Mr. Beadle, seconded by Mr. Story, and carried unanimously, "That this meeting requests the following gentlemen to act as its committee:—Mr. Fairs, Mr. Mann, Mr. Brady, Mr. Swan, Mr. Proctor, and Mr. Forth."

A vote of thanks to the chairman for his services, and to the Council of the College for the use of their room, concluded the proceedings.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The annual festival of this Association took place in the Choral Hall on Thursday evening, 14th of January, Mr. Thomas D. Moffat presided, and was accompanied to the platform by Messrs. Kinninmont, Hatrick, Bait, Black, M'Millan, Davison, and others, of Glasgow, Mr. Duncanson, of Stirling, Mr. Kemp, of Edinburgh, Mr. Ferguson, of Greenock, Drs. Carter, Moffat, Tannahill, Robertson, Hislop, Wood, Smith, J. G. Wilson, etc. There were upwards of 400 ladies and gentlemen present, and the hall presented a very brilliant appearance. After tea the chairman delivered his address. He alluded to the altered circumstances under which they met, in consequence of the passing of the Phar-

macy Act, which he believed, after some few points had been settled on which there was a difference of opinion, would be found to be for the benefit both of ourselves and the general public. He observed, "Though this is the first Act which affects and restricts the pharmacists of the whole of Great Britain, it is by no means the first that has been passed for our benefit in the west of Scotland; for, on the 30th November, 1599, nearly 300 years ago, James the Sixth gave a charter (which was afterwards confirmed by Parliament) to a physician, a surgeon, and an apothecary; 'Maister Peter Low, Maister Robert Hamiltone, and Maister William Spang, and thair successouris, indwelleris of our citie of Glasgow, *GEVAND* and *GRANTAND* to thame and thair successouris, full power to call, sumonnd and convene before thame, within the said burgh of Glasgow, or onie otheris of ouir said burrowis or publict places of the foresaid boundis, all personis professing or using the said airt of chirurgie, to examine thame upon their literature, knawledge, and practize; gif they be found wordie, to admit, allow, and approve thame, give thame testimonial according to their airt and knawledge, that they sal be fund wordie to exercise thareftir, resave thair aithes, and authorize thame as accordis, and to discharge thame to use onie farder nor they have knawledge passing their capacity, laist our subjects be abusit.'

"The likeness of this charter to the present Pharmacy Act is astonishing; it shows how history repeats itself in pharmaceutical as well as other affairs, and I will quote two clauses to show the resemblance. The Pharmacy Act, 1868, says, 'That any person who shall use, or exhibit the name or title of chemist and druggist, not being a duly registered pharmaceutical chemist, or chemist and druggist, shall, for every such offence, pay a penalty or sum of five pounds.' The old Act says, '*Fythlie*, That na manir of personis sell onie droggis within the Citie of Glasgow, except the sam be sichtit be the saidis visitouris, and be William Spang, apothecar, under the pain of confiscatioune of the droggis.' Again, the Act of 1868 says, 'And on every sale of any such article (poison) the seller shall, before delivery, make, or cause to be made, an entry in a book to be kept for that purpose, stating the date of the sale, the name and address of the purchaser, the name and quantity of the article sold, and the purpose for which it is stated by the purchaser to be required, to which entry the signature of the purchaser, and of the person, if any, who introduced him, shall be affixed.' The old Act ordered '*Sextlie*, That nane sell ratoun poison asenick or sublemate, under the pane of ane hundred merkis, excep onlie the apothecaries, quha sal be bund to tak cautioun of the byaris, for coist, skaith and damage.' Under this charter, the Faculty of Physicians and Surgeons of Glasgow continued to examine and grant licenses to surgeons and apothecaries. At first the practice of pharmacy and surgery were generally combined, and the first date of the licensing of an apothecary distinct from surgeon is in 1614, when 'Gabriel Syeserf, pothecar, is admittit freman and brother of craft, and he to use his ain calling.' In these times of the Major and Minor examinations of the Pharmaceutical Society, when so many of the sciences are included in pharmacy, we are perhaps rather apt to underrate the examination of those days; but there is evidence of its having been very strict, and though, perhaps, not so theoretical as it is nowadays, it certainly seems to have been very practical. On the 19th of June, 1658, David Spiers petitioned to be allowed to practise pharmacy, and was ordered to make 'consectio hamech, pilulæ cochir majores, emplastrum de mucilaginibus, linimentum mici, trochei albi rasis,' when he passed his pharmaceutical examination satisfactorily. In those days the compounds were very complex. In an old pharmacopœia I lately counted forty-five different ingredients in one ointment. That was in the officinal prescription, but it seems scarcely possible that in making it the whole of them would be used. For two hundred years the Faculty continued to grant diplomas to practise pharmacy alone, but this has long been discontinued, and the last pharmacist who held one of the old licences was the late Mr. John Niel, of this city. Some time ago, before the present Act was thought of, I made application to be examined and licensed, but, owing to the diploma being apt to be represented as a higher one, my application was refused. The reason for refusal I can understand to be an excellent one, and I can appreciate the caution with which all licences must be given, but at the time, I considered that the highest honour I could get, would have heen an educational certificate and diploma under that good old charter of James the Sixth.

"But that old Act, so far as regards pharmacy, is now superseded by this new one, which is so singularly like it in its provisions. Its administration is now in the hands

of those whom I believe to be the proper parties—the pharmacists themselves. I believe that the rigid examination will raise the status and usefulness of our profession, and I am glad that the Association under whose auspices this meeting is held, was so quick to establish classes for the necessary practical course of study.

"Our gratitude is due to those men in the Pharmaceutical Society, and out of it, who so long strove to gain this important end, and who, having gained it, devote their time and energies to its working. But I doubt not that the complete working of it lies, in a great measure, with ourselves, and I hope that by acting in unison, and looking after our interests, we shall reap in full the benefits which it can confer."

Addresses were delivered by Mr. Duncanson, who is an old member of the Association, and by Mr. Kemp. The entertainment was agreeably varied by music and singing by several eminent artistes, and the evening's amusement concluded with a ball, which passed off with great success.

MANCHESTER CHEMISTS AND DRUGGISTS' ASSOCIATION.

On Wednesday, January 13th, Professor Roscoe delivered, in the Theatre of Owens College, the first of a course of lectures to the members of the Manchester Chemists and Druggists' Association, on chemistry as applied to pharmacy. Principal Greenwood, in opening the proceedings, stated that he had received a request from the Society, asking for help to carry out in a working manner the provisions of the new Pharmacy Bill, and he was glad to render what assistance he could. It so happened that Professor Roscoe and himself had observed the usages and practices of Germany in regard to the pursuit of chemistry, and they were struck with the complete and satisfactory manner in which the German Government made provision for the study of chemistry, as applied to pharmacy. Mr. Standring explained the provisions of the new Pharmacy Act, and the efforts which had been made from time to time to obtain the passing of a Bill to regulate the practice of pharmacy; and he stated that one of the provisions of the new Bill was to require every student to pass a regular examination and obtain a pharmacy certificate before he commenced business. Mr. W. S. Brown stated that the Society was greatly indebted to Principal Greenwood and Professor Roscoe, and to the Trustees of Owens College, for the facilities which they had given in the delivery of the lectures. Professor Roscoe said he believed that the new Pharmacy Bill would be of immense value to the public, and would have a most important influence upon the profession. There were a few points which might be amended, but on the whole the Act would be the means of raising the character of the profession of Pharmaceutical Chemists, and at the same time benefit the whole population. The Professor then proceeded with his lecture, which was illustrated by a variety of interesting experiments.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

It was thought desirable to make an effort to establish at Nottingham an Association for the purpose of inter-communication of opinion—for the better scientific education of assistants and apprentices—and for the encouragement of that kindly spirit of good-fellowship which was exhibited in so marked a manner at the recent visit of the British Pharmaceutical Conference, which tended so much to the great success of that meeting. To carry this into effect, a supper was provided at the 'Maypole,' on Thursday, Dec. 10, 1868. After the cloth had been removed, and the usual loyal toasts drunk, the Chairman, Mr. J. H. Atherton, F.C.S., delivered an address, of which the following is a summary:—

I must, in the first place, congratulate this meeting on the passing of the Pharmacy Act. 1868 will be a Red Letter year in the annals of Pharmacy. The general operations of the Act will undoubtedly be of great service to us; there are some points in which improvements might and will be made, but the grand fact is established, we are now a professional body, examined, registered, and under the supervision and authority of the Privy Council. As is the wise policy of English Government, existing rights are maintained, but for the future every chemist will be a fully qualified man according to the

laws of the country; there will be better education, and consequently a better class of men; this will produce a better feeling in our ranks, better prices and larger fortunes will result. The fear of examinations and other causes will preclude many from joining us, therefore our numbers will decrease, but the quality will increase. When we consider the large number of men, lamentably deficient in both general and technical education, who combine the sale of powerful drugs with the retailing of almost every imaginable article, we must all rejoice that the time has come when such persons will be compelled to leave the sale of medicines in the hands of duly qualified men, thus conducing to the greater safety and welfare of all her Majesty's subjects. But with our greater privileges we have more responsible duties, and we must strive to render ourselves worthy of our improved position; we must endeavour to increase our own knowledge, and what is of more importance, we must give every facility for education to our assistants and apprentices. Remember that while we are safely over the brook, they are on the other side; and surely it is our duty, and will be our pleasure, to do all we can to assist them in the work they have before them. I say, therefore, that it is incumbent on us, as chemists and as masters, to carry out the good work commenced by the Pharmacy Act, and it seems to me that this can only be done by local organization, and that by the aid of such a society as that about to be proposed, we shall assume our true position, neither solely as scientific men, nor as commercial men, but as a link between the two, and mingling the characters of both; and thus, by giving confidence to the medical profession and the public, secure to ourselves pecuniary benefit as well as improved social standing. To accomplish this, we propose that every Pharmaceutical Chemist and Chemist and Druggist in the county shall be urged to become a member of the Society, and every assistant and apprentice invited to become an associate. The objects of the Society will be to promote, as far as we are able, the general advancement of Pharmaceutical Science; the scientific education of the associates, with a view to qualifying them for the examinations, which, by the provisions of the Act, they will all have to undergo; to take cognizance of and discuss any matter affecting us as a body, and to give our voice as a district and a Society in all matters, legal or otherwise, by which our interests are affected; to exercise supervision over the district, to prevent evasions of the Act, such as the registration of unqualified persons, or the sale of poisons by any non-registered person. It is obvious that unless some such precautions are taken the good effects of the Act will be limited. As regards our meetings, the time and place will be appointed by your Council, subject to your approval. Your President's address would occupy the first meeting in each session, and the next two meetings in the first session would be well employed in discussing the Pharmacy Act. Then, again, the changes in the Pharmacopœia, the many new medicines introduced, and the new processes involved, will afford plenty of scope for short papers. If we have only a few lines, a paper occupying a few minutes, or a verbal description of any novelty, from our members or associates, we shall have enough, and continue to increase the interest of our proceedings. We also propose to establish a Library, a nucleus of which exists already, and to form classes in Materia Medica and Pharmaceutical Chemistry for the associates. In concluding, I would say, before the resolution is put to the meeting, that if you think such a society is desirable, let us unite in the spirit of these remarks and determine not to fail. If you have any fear of failure—if you are not in earnest, let us not start, let us stay where we are; we shall respect ourselves the more for it. But if you approve the plan, let us work together humbly and with determination. As we do this, so shall we succeed.

The resolution was then formally proposed by Mr. W. H. Parker, and seconded by Mr. Dann, and was unanimously carried.

The following names were then chosen as OFFICERS:—*President*, Mr. J. H. Atherton, F.C.S.; *Vice-President*, Mr. Frank White; *Treasurer*, Mr. J. Rayner; *Hon. Sec.* Mr. R. Fitzhugh, F.C.S. COUNCIL:—Mr. Dann, Mr. J. Jenkins, Mr. T. Harrison, Mr. W. H. Parker, Mr. G. Shepperley, jun., Mr. W. Smith, Mr. G. Waterall, Mr. W. Woodward.

The meeting, which numbered nearly forty, shortly afterwards separated.

The first ordinary meeting will be held on Friday, the 12th February, when the president will deliver the inaugural address.

HALIFAX AND DISTRICT CHEMISTS AND DRUGGISTS' ASSOCIATION.

The Pharmaceutical Chemists and Chemists and Druggists of Halifax, Brighouse, Elland, and Sowerby Bridge, met at the 'Brown Cow' Hotel, Halifax, on December 10th, 1868, to discuss the New Pharmacy Bill and to form an Association.

After dinner Mr. DYER was elected Chairman. After the usual loyal toasts had been proposed and duly responded to, Mr. FARR proposed the following resolution:—"That it is desirable to form an Association, to be called the 'Halifax and District Chemists and Druggists' Association.'" In an able manner he dilated on the necessity of an Association being formed; the great changes which had recently been effected in the position and responsibilities of the trade required their conferring together to understand the many technicalities which would now every day confront every member of the trade, and graphically pointed out the great good which ensue from the creation of a common brotherhood in dispelling those feelings of jealousy and antagonism which were so destructive of the best interests of the trade.

Mr. SHAW, in seconding the resolution, spoke as confidently of the good which would result from such a movement.

The resolution was unanimously passed. A number of rules for the government of the Association were passed, and the following gentlemen were elected as officers and Committee for the ensuing year:—*President:* Mr. Dyer. *Vice-Presidents:* Mr. Kershaw, Mr. Brooke, Mr. Stott, Sowerby Bridge. *Secretary:* Mr. W. C. Hebden. *Treasurer:* Mr. J. Pollard. *Committee:* Messrs. Farr, Shaw, Jessop, and Brierley.

The PRESIDENT then drew the attention of the members to the New Pharmacy Bill, inviting their opinion as to its merits. As this subject is a prolific ground for discussion, it was entered into by all present; the status given to the trade, and certainty of all future Chemists and Druggists being of the right stamp, were subjects for mutual congratulation; the chief interest was, however, centred in the poison clauses, the unnecessary and troublesome precautions which are enforced were universally regretted, especially with regard to the milder preparations of opium.

Mr. SHAW, the local Pharmaceutical Secretary, kindly offered to write to Bloomsbury Square for information on the point in question.

Mr. J. B. BRIERLEY then proposed a vote of thanks to the Chair, to which the PRESIDENT briefly replied.

The meeting then broke up.

A Second Meeting of the members of the above Association was held on the 7th of January, Mr. KERSHAW in the chair, who stated that the first matter to take into consideration was the information received from the Secretary of the Pharmaceutical Society as to the point in dispute at the last meeting.

Mr. Shaw not being present, the Secretary read the letter received from London in explanation, the vagueness of which, however, left the members in much the same dilemma as before. After considerable discussion, the following resolution was passed:—

"That all medicines prescribed, which contain any of the drugs in either the first or second schedules of poisons, must be entered the same as a prescription dispensed."

The SECRETARY then read a copy of a Bill intended to be brought before Parliament next session by Mr. Dixon, of Birmingham, entitled, "The Adulteration of Drugs Bill," imposing very heavy penalties on the maker and on the dealer "knowingly" of adulterated drugs. It was generally approved of by the members, and a motion to that effect was proposed and carried.

The subject of an uniform rate of charges for mixtures dispensed was then mooted, and very energetically advocated by some of the members, who were very desirous of raising the minimum price to a more remunerative figure.

The SECRETARY begged of them not to push their views too strongly, and promised to use his influence to endeavour to obtain a more uniform rate of charges among their brethren.

The meeting then separated.

ORIGINAL AND EXTRACTED ARTICLES.

NOTES AND ABSTRACTS IN CHEMISTRY AND PHARMACY.

BY C. H. WOOD, F.C.S.

Guyot's Concentrated Tar Solution.

In the current number of the 'Journal de Pharmacie' is a paper by Dr. Jeannel on a preparation of tar known in commerce as "Guyot's Concentrated Tar Solution." From an analysis of this liquid, the author has deduced the following formula for its reproduction:—

Bicarbonate of Soda . . .	22 parts.
Tar (from Wood)	25 ,,
Water	1000 ,,

Macerate together for eight days, shaking the mixture several times each day.

The decanted fluid is identical in all respects with the commercial article; it has the same colour, transparency, and alkalinity; it possesses the same power of mixing with water without turbidity, and contains the same proportion of tarry matter.

M. Jeannel considers this liquor as very inferior, therapeutically and practically, to the emulsion of tar which he originally devised. This emulsion was made with

Tar,	
Carbonate Soda, āā	10 parts.
Water	1000 ,,

and, according to the author, contains four times less saline matter, and four times more tar, than Guyot's preparation.

The latter (Guyot's) solution, diluted with sixty or eighty times its volume of water, forms a clear tar-water for internal administration; in a less diluted condition it is also employed as a lotion.

Syrup of Violets, Prepared with Dried Flowers.

Syrup of Violets can only be made once a year, when the flowers are in season. M. Bouilhon finds this frequently occasions inconvenience to the pharmaceutist, because as the syrup does not keep very well, it is not desirable to prepare too large a stock, and hence it every now and then happens that the syrup is exhausted before the fresh flowers are attainable. To mitigate this annoyance, M. Bouilhon has devised the following formula by which a syrup may be prepared from the dry flowers:—

Dry Violet Petals	2 grammes	(40 parts).
Boiling Distilled Water . .	100 ,,	(2000 ,,).
Citric Acid, about . . .	5 milligrammes	($\frac{1}{10}$,,).

Infuse four hours in a tin vessel, strain off the infusion, pour a little water on the residue, and squeeze out until 100 grammes of liquor are obtained. Make this into syrup in the usual manner.

Chloroform in the Urine.

The urine of patients who have inhaled chloroform, when tested with sulphate of copper and potash, gives a copious indication of the presence of sugar. The result, however, is not due to sugar, but to the chloroform. Traces of the latter substance in the urine cause a reduction of the oxide of copper in precisely the same manner as glucose. The presence of chloroform in urine may be detected by causing a current of air to bubble through the urine, then to traverse a red-

hot porcelain tube, and finally to pass through a Liebig's bulb containing a solution of nitrate of silver. The vapour of the chloroform diffuses into the stream of air, is decomposed in the heated tube, and the resulting chlorine precipitates the silver solution.*

The Washing of Precipitates.

The January number of the 'Philosophical Magazine' contains a full translation of a memoir published in the Annalen der Chem. und Pharm., by R. Bunsen, on the washing of precipitates. This paper is a very valuable and interesting one. The author deduces a mathematical formula for calculating the amount of water necessary for washing a precipitate, and describes a new form of vacuum filter for hastening the process of filtration in analytical operations.

A precipitate is washed by repeatedly diffusing it through a given quantity of water, the portion of liquid not mechanically retained being each time separated from the precipitate either by decantation or by draining on a filter. This process is continued until the amount of impurity becomes so minute that its presence may be disregarded. Precipitates obtained in the course of chemical analysis may in all cases be assumed to be sufficiently washed when the impurity retained by them amounts to no more than the $\frac{1}{10000}$ part.

Since some of the principal sources of error in analytical work consist in the incomplete or in the too protracted washing of precipitates, it becomes important to know how to ascertain the progress of the washing throughout the several stages of the process. By employing the same volume of water at each successive addition, and estimating its relation to that of the precipitate remaining at the bottom of the vessel or upon the filter, we can find from the following table the number of times it is necessary to decant in order to diminish the amount of impurity in the precipitate to the $\frac{1}{100000}$, $\frac{1}{30000}$, $\frac{1}{20000}$, or $\frac{1}{10000}$ part. Column I. shows the relation between the volume of the precipitate and that of the washing-water employed for each successive decantation; column II. the number of decantations required to diminish the amount of impurity to the necessary extent; and column III. the total volume of water obtained from the several decantations.

When the washing process is performed in a beaker, the relation between the volume of the precipitate and that of the liquid may be easily determined by holding a strip of paper along the side of the vessel, and marking upon it the respective heights of the precipitate and supernatant liquid; then, on folding the portion of paper lying between the two marks in such a manner that each fold corresponds to the height occupied by the precipitate, the number of folds will give the number in column I. to find in column II. the number of decantations needed to wash to the required extent. If the washing be conducted as in the ordinary method of filtration, the capacity of the filter to be employed is first learnt by filling it with water from a burette or measure-glass, the volume it holds being represented by V. The precipitate is next collected on the filter, and allowed to drain; then the filter is filled up from a graduated washing bottle, mixing the precipitate as thoroughly as possible with the water. The volume of water required for this, deducted from the volume V, gives the volume of the precipitate, or v. When V is divided by v, the product expresses the relation between the volume of the precipitate and that of the washing-water. This number is sought in column I., and opposite to it in II. is the number of times it is necessary to refill the filter in order to wash the precipitate to the required extent.

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* Extracted from the Journ. de Pharm. d'Anvers.

$\frac{1}{100000}$.			$\frac{1}{50000}$.			$\frac{1}{20000}$.			$\frac{1}{10000}$.		
I.	II.	III.	I.	II.	III.	I.	II.	III.	I.	II.	
$\frac{V}{v}$.	*n.*	W.	$\frac{V}{v}$.	*n.*	W.	$\frac{V}{v}$.	*n.*	W.	$\frac{V}{v}$.	*n.*	W.
0·5	28·4	14·2	0·5	26·7	13·3	0·5	24·4	12·2	0·5	22·7	11·4
1	16·6	16·6	1	15·6	15·6	1	14·3	14·3	1	13·3	13·3
2	10·5	21·0	2	9·8	19·7	2	9·0	18·0	2	8·4	16·8
3	8·3	24·9	3	7·8	23·4	3	7·1	21·4	3	6·6	19·9
4	7·1	28·6	4	6·7	26·9	4	6·1	24·6	4	5·7	22·9
5	6·4	32·1	5	6·0	30·2	5	5·5	27·6	5	5·1	25·7
6	5·9	35·5	6	5·6	33·4	6	5·1	30·5	6	4·7	28·4
7	5·5	38·8	7	5·2	36·4	7	4·8	33·3	7	4·4	31·0
8	5·2	42·0	8	4·9	39·4	8	4·5	36·1	8	4·2	33·5
9	5·0	45·0	9	4·7	42·3	9	4·3	38·7	9	4·0	36·0
10	4·8	48·0	10	4·5	45·1	10	4·1	41·3	10	3·8	38·4
11	4·6	51·0	11	4·4	47·9	11	4·0	43·8	11	3·7	40·8
12	4·5	53·9	12	4·2	50·6	12	3·9	46·3	12	3·6	43·1
13	4·4	56·4	13	4·1	53·3	13	3·8	48·8	13	3·5	45·4
14	4·2	59·4	14	4·0	55·8	14	3·7	51·1	14	3·4	47·5
15	4·2	62·3	15	3·9	58·5	15	3·6	53·6	15	3·3	49·8
16	4·1	65·0	16	3·8	61·1	16	3·5	56·0	16	3·3	53·0
17	4·0	67·8	17	3·7	63·6	17	3·4	58·3	17	3·2	54·2
18	3·9	70·4	18	3·7	66·1	18	3·4	60·5	18	3·1	56·3
19	3·8	74·3	19	3·6	68·6	19	3·3	62·8	19	3·1	58·4

This table is constructed from a formula given by the author in his paper.

Professor Bunsen strongly recommends washing precipitates by this method with use of the table, in preference to employing the method generally followed, of ascertaining the completion of the washing process by evaporating a portion of the filtrate on platinum foil, since the indications so obtained can only be trustworthy in dealing with extremely insoluble precipitates.

The very ingenious vacuum-filter and water air-pump described by the author will be noticed in the next number of this Journal.

THE EXAMINATION OF APOTHECARIES' ASSISTANTS AT THE APOTHECARIES' HALL OF IRELAND.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—No previous course in ARTS or any APPRENTICESHIP is required at the Apothecaries' Hall of Ireland from candidates for "the certificate of assistant."

The Company have given their consent to a Bill having for its object the qualification of a class of Pharmaceutical Chemists in Ireland. I publish these facts on Dr. Leet's authority.

Your obedient servant,

THOMAS J. MONAGHAN.

January 13th, 1869.

AN ATTEMPT TO ANSWER THE QUESTION—WHICH PART OF THE PLANT *CONIUM MACULATUM* IS THE BEST FOR MEDICINAL USE?

BY WM. MANLIUS SMITH, M.D., MANLIUS, N.Y.

[NOTE.—Last year we published the statements of Dr. Harley, of London, in relation to the conium of England, and it is but proper to give place to the report of Dr. Smith, who is a careful and qualified experimenter. It is to be regretted that a remedy so much used should be so variable. We have known two-grain pills of Tilden and Co.'s "Ext. Conii," U.S.P., to be returned because of their excessive activity, the patient supposing that an error had been made; and formerly, when illustrating the chemistry of conium, we used a specimen of Thayer's fluid extract as being particularly good. The great importance of uniformity in the strength of medicines of this class should cause manufacturers to carefully seek out all causes of variation, and avoid them,—immature plants, those that are too old, and those that have become altered by the fermentative action arising from the green plant lying in heaps, preparatory to pressing it. It is well known that most of the conium used by the extract makers is of spontaneous growth, along roadsides and near dwellings, and that often many hours, if not a day or two, elapses between the gathering and pressing. Now it is quite probable that much of the conium may be more or less injured by this fermentation, according to the extent it has advanced; and, as it is not probable that the injured plant is rejected, it is to be feared that much inferior conium enters the preparations of commerce. Formerly, when alcohol was cheap, we believe Tilden and Co. used to sprinkle the recent herbs with it, with a view to retard decomposition. They formerly added alcohol to the marc before pressing for similar reasons, and to favour the extraction of the juice. We do not know what the present custom is. So long as the business of making narcotic and other extracts from green plants is consigned to these large operators, it is very needful that they should use every precaution to guard against deteriorating causes.—ED. AMER. JOURN. PHARM.]

If we place any confidence in the maxim "Ubi virus, ibi virtus," we should expect to find in *Conium maculatum* a valuable medicinal agent; for, since the days of Socrates, it has been known that the hemlock in efficient quantities is capable of destroying life. But if we are to judge of its value by the degree of use commonly made of it by medical men, we can assign it only an inferior rank in the Materia Medica.

If we reflect, however, that the disuse into which conium has fallen may have arisen from the circumstance that the preparations of it attainable by physicians vary more in quality than those of most other medicinal substances, and that frequently these preparations are totally destitute of activity, we may think it worth our while to inquire if there is not some means by which such a degree of uniformity and stability can be given them as to render them worthy of the confidence and reliance of the medical profession.

It was with a view of fixing upon some good plan for securing this result, and also with the hope of adding, perhaps, something to the general stock of knowledge with regard to the therapeutic uses of the article, that the subject of conium was accepted by the writer for examination. In the outset of the investigation, the fact presented itself that pharmacopœias differ as to the part of the plant recommended for medicinal use, the U. S. Pharmacopœia directing the leaves, and the British the fruits or seeds. From all that could be gathered from the ordinary treatises on Materia Medica, it would seem that the seeds are the most active, but how much more energetic is not specified.

The first thing in order, then, seemed to be to settle, by some precise and accurate experiments, the difference, if any, existing in different parts of the plant as respects their activity. As the medicinal efficacy of conium is believed to reside in the alkaloid, or alkaloids existing in it, the method of ascertaining the comparative quantities of these alkaloids that are contained in different parts of the plant presented itself as an available one for the purpose in view.

The plan adopted has been to make, as nearly as possible, precisely similar preparations from the leaves collected at two different stages of growth, and from the seeds at different degrees of maturity, and then by a delicate re-agent to test their comparative richness in the alkaloids. The re-agent used was that recommended by F. F. Mayer in the 'American Journal of Pharmacy,' vol. xxxv. p. 23, consisting of a dilute solution of iodide of potassium and corrosive sublimate in water. As comparative results only were aimed at, the following modification of the course of proceeding prescribed by Mayer was adopted:—The various solutions to be tested were each diluted with carefully-ascertained amounts of water till but a faintly perceptible turbidity was produced on

the addition of the test liquid, and the comparative strengths estimated by the amount of dilution that each solution admitted of.

The 30th July, 1866, a quantity of leaves was collected from a conium plant just fairly in flower. All withered and sickly-looking portions, as well as the greater part of the petioles, both general and partial, having been rejected, four parcels of 500 grains each were accurately weighed out, and designated A^1, A^2, A^3, and A^4. Of these, A^3 and A^4 were each thoroughly bruised in a mortar for five minutes, and then transferred to a half-pint bottle, and 1000 grains by weight of diluted alcohol added. The mortar was well cleansed and dried between each operation. Parcels A^1 and A^2 were placed to dry, thinly spread out on paper, in a darkened room, and occasionally turned. The bottles containing A^3 and A^4 were well stopped with corks, covered with thick paper and placed in a cellar.

The same day the leaves were collected from other plants wholly out of flower, and having the fruits on the more mature umbels nearly, if not quite, full grown. These leaves—the same care being used to reject inferior portions—were likewise weighed into parcels of 500 grains each, and designated B^1, B^2, B^3, and B^4, and were treated exactly as the corresponding parcels designated A.

The fruits that appeared to be full grown were collected from the same plants that furnished the leaves designated B, by cutting off with scissors the umbellules entire. Four parcels of 500 grains each were made of them, designated C^1, C^2, C^3, and C^4, which were treated as parcels A and B had been.

The partly-grown fruits from the same plants furnishing B and C, consisting of those which had but just dropped the flower, and those that were about half grown, situated, as they were, on the same umbellules, were collected by cutting off the umbellules entire, and four parcels of 500 grains each made, and treated as before. These were designated D^1, D^2, D^3, and D^4.

On the 3rd of August those parcels that had been placed to dry were weighed, and on the 23rd of August were weighed again. The weights being essentially the same in both instances, it was concluded that the drying process had reached its limit. The several parcels weighed as follows:—A^1 113 grains, A^2 110 grains, B^1 158 grains, B^2 159 grains, C^1 and C^2 each 183 grains, D^1 185¼ grains, and D^2 183 grains.

A^2 (that is, the dried leaves from the plant in full flower) was pounded in a mortar till the powder all passed through a sieve of 37 meshes to the linear inch. In this operation it lost four grains. The remaining 106 grains were placed in a half-pint bottle, and 390 grains of water and 1000 grains of diluted alcohol added. The object of adding the water was to make the menstruum used, in effect, the same as that in which A^3 and A^4 had been put to macerate. Parcel A^1 was wrapped up, first in writing-paper and then in thick brown paper, and laid on a shelf, for examination after a time sufficiently long to test its keeping properties.

B^2, or the leaves from the plants wholly out of flower, were treated in the same way that A^2 had been, except that 341 grains of water only were needed to supply that lost in the drying process. Parcel B^1 was treated as A^1, as were also C^1 and D^1. C^2, or the full-grown but unripe and green fruits or seeds, was powdered till 160 grains passed through the sieve. The remainder, consisting mainly of pedicels, weighed 20 grains. Both the 160 grains of powder and the 20 grains of pedicels were placed in a half-pint bottle, and 320 grains of water and 1000 grains of diluted alcohol added. D^2, or the full-grown seeds, gave a weight in powder and pedicels of 177½ grains, and was treated with 320 grains of water and 1000 grains of diluted alcohol. All the bottles, as before, were wrapped in brown paper, and placed in a cellar. There they remained till January 18th, 1867, when tinctures were made from each lot by percolation; a funnel, with the throat so obstructed with flax as to deliver a drop about once a minute, being used as a percolator. A^3 was first placed in the funnel, and diluted alcohol poured on till a little over four ounces of liquid had passed,—that is, till the four-ounce vial used as a receiver was filled to a mark on its neck. The tincture obtained was then transferred to the bottle in which the leaves had macerated, it having been thoroughly washed and dried—the exhausted matter removed from the funnel—the funnel well rinsed and wiped, and half an ounce of diluted alcohol passed through to rinse out the obstructing plug, before B^3 was introduced. In like manner, B^3, C^3, D^3, and A^2, B^2, C^2, and D^2 were treated, the funnel being carefully cleansed between the percolations of the several parcels. The same amount of tincture was thus obtained from each, made, as nearly as possible, with the same menstruum.

In order to apply the reagent selected, it was next necessary to get rid of the alcohol in the specimens to be tested. A certain definite and equal portion of each (20 cubic centimetres, or between 5 and 6 fluid drachms) was taken, the same amount of a watery solution of oxalic acid added to each portion of tincture taken, which was then evaporated by a gentle heat, not rising above 110° F., to approaching dryness. The residues were then diluted with water to the original volume of 20 c. c. each, and afterwards still further diluted, as occasion required, till they each were affected to the same faint degree of turbidity, by the application of the test-liquid. It was found that the liquid from the leaves of the plant just in full flower admitted of a dilution with one and a half times its volume in water. That from the leaves from the plant gone to seed bore but a quarter its volume of water; that from the full-grown seeds required dilution with seven volumes of water, and that from the immature seeds gave a perceptible turpidity with the test-liquid when diluted with eight times its volume of water, making the comparative strengths, in the active principle, as follows:—$A^3=10$; $B^3=5$; $C^3=32$; and $D^3=36$. These experiments showed the partly-grown fruits to be the most active portion of the plant. The tinctures made from the several parcels of leaves and seeds after drying gave very unexpectedly the same figures, with the corresponding tinctures made from the undried specimens, from which results the inference was drawn that the method of drying adopted had not dissipated any of the active principle.

Some full-grown fruits, collected in August, 1859, dried in a darkened room, and kept in a paper package on a shelf, exposed to the ordinary changes of temperature from changes in the seasons, were also examined. A quantity of them were powdered till they passed through the sieve of 37 meshes to the inch, and 177 grains of the powder, corresponding with the amount of powder of seeds used in the previous experiments taken, moistened with water acidulated with oxalic acid, placed in a conical percolator, and water poured on till the same amount of liquid was obtained as in the previous experiments. This solution was found to bear dilution with seven volumes of water before reaching the limit of perceptible reaction with the test-liquid. This seems to indicate that the dried seeds retain their activity unimpaired for upwards of seven years. But it should be borne in mind that as the summers of 1859 and 1866 probably differed in temperature, so the plants grown in those years may have differed in their original content of the active alkaloids.

Specimens of fluid extract of conium (U.S.P.), (that is, of the dried leaves), prepared by Dr. E. R. Squibb, and also of fluid extract of conium seed, prepared by the same hands from the dried, full-grown, but green fruits, were also tested in the way narrated above, the same amounts, 20 c. c., being operated on. The results obtained were, that the oxalic solution prepared from the fluid extract of the leaves bore dilution with thirty-two volumes of water, while that from the fluid extract of the seed bore dilution with 224 volumes of water, making the seeds in this case seven times as strong as the leaves.

It may be a matter of interest to state further that a fluid extract of conium, bearing the label of Tilden and Co., and one with the label of Henry Thayer and Co., were also tested in the same manner. By this method the solution from Tilden's extract bore dilution with about two-a-half volumes of water, while that from Thayer's gave no reaction, even when undiluted. Some further investigation showed that this want of reaction was due, perhaps, to the presence of acetic acid, and so a modified form of the operation was tried with the three fluid extracts, *i. e.* Squibb's, Tilden's, and Thayer's. The oxalic solutions obtained, 20 c. c. of the fluid extracts, were treated with solution of caustic soda till they gave decided alkaline reactions. They were then shaken in closed vials with about three times their bulk of ether, added in four successive portions, and the ethereal portion decanted and evaporated in contact with water acidulated with oxalic acid. These same bulks of ethereal solution were obtained in each case, and the same amounts of the same strength of acidulated water used. The residues obtained were diluted to the same extent, and the further dilution they would bear tested with the reagent before mentioned. In this series of experiments Squibb's fluid extract (of leaves) gave a solution bearing dilution with twenty times its volume of water, Tilden's one-and-a-half times its volume, and Thayer's four times its volume, making the comparative strengths of Squibb's 42, Tilden's 5, and Thayer's 10.

Some fluid extract made from the fresh fruits of conium in 1854, in such a manner that a minim of the liquid represented a grain of the undried seeds, was also tested.

The oxalic solution was found to bear dilution with nineteen times its volume of water. If we suppose the seeds from which this preparation was made in 1854 to have been of equal strength with those gathered in 1866, it will follow that this preparation, after the lapse of thirteen years, still retained about two-thirds of its original efficacy. But of course no reliable inferences can be drawn from a mere supposition.

The only experiment yet made by the writer, in the investigation in progress, to test the therapeutic effects of the conium, consisted in his swallowing sixteen minims of Squibb's fluid extract of conium seed, with a view of arriving at some idea of the suitable medicinal dose. The quantity mentioned, taken about five hours after breakfast, produced marked operative effects in about twenty minutes. The effects manifested were a peculiar sensation of heaviness in the eyelids, and, as it seemed, some degree of ptosis, and a feeling akin to dizziness, that made it quite unpleasant to retain a sitting posture. There appeared to be no disposition to sleep produced. The effects were at their height in about an hour, and mainly passed away after the lapse of two hours from the time of taking the dose. A moderate meal had been eaten in the interval.

This experiment would indicate a suitable *commencing* dose of the fluid extract above mentioned to be about five minims.

What appears to have been arrived at by the experiment narrated is this:—That the immature fruits of conium are far preferable to the leaves; that they may be dried without serious injury; and that a very active preparation may be made from them. The further course of this investigation it is designed to direct towards ascertaining, if possible, some of the causes producing the want of uniformity and stability desirable in the preparation of conium, with a view of obviating them, if it may be, and also toward obtaining such experimental knowledge of the physiological and therapeutic effects of the article in question as shall lead to additional practical applications of it.—*Amer. Journ. of Pharmacy, from Trans. N. Y. State Med. Soc.*, 1867.

CARBOLIC ACID IN SCARLATINA AND TYPHUS.

This remedy has been strongly recommended by Mr. P. Le Neve Foster in the 'Times' of January 15th, but the dose indicated was such as to call forth a protest both from Dr. Fuller and Dr. Lionel Beale. Mr. Foster having directed that the concentrated medicinal carbolic acid to be diluted with water in the proportion of one of the acid to ten of water, of which solution one teaspoonful should be given every three hours for children, and every two hours for adults. Dr. Fuller and Dr. Beale ('Times,' January 18th) think that such a dose would be injurious, and, in the case of children, probably prove fatal; and Dr. Beale thinks that one part of the acid to 200 parts of water is strong enough for administration internally, but is of opinion that the salts of carbolic acid, such as the sulpho-carbolate of soda recently recommended by Dr. Sansom, are safer for internal administration, and probably equally efficient.

An explanatory letter from Mr. Foster appeared in the 'Times' of January 19th, in which he states, "I used the words 'concentrated medicinal carbolic acid,' by which it is hardly necessary to say that I did not mean the 'concentrated acid.' I referred to what is sold by chemists under the title of 'solution of best medicinal carbolic acid.' This is the solution to be diluted with ten parts of water, and when thus diluted, the dose I named was a teaspoonful." Of course a teaspoonful of such a mixture would be a very small dose.

This letter was followed by a rejoinder from Dr. Fuller, who states, "I have obtained from one of our leading chemists three samples of Messrs. Calvert's carbolic acid. The first is the pure acid in a crystalline form, and labelled 'carbolic acid for medicinal use;' the second is a solution consisting of nine parts of pure carbolic acid and one part of water, and is labelled 'carbolic acid for medicinal use;' the third is also a solution, containing one part of pure carbolic acid and twenty-four parts of water, and is labelled 'solution of best medicinal carbolic acid.' The only recognized officinal solution of carbolic acid contains one part of carbolic acid to four of glycerine. I am informed that comparatively few chemists keep Calvert's weakest solution, and that in the country especially any person sending to a chemist for a 'solution of best medicinal carbolic acid,' would probably be furnished with one of the stronger solutions,—probably with the last-named solution, which is contained in the Pharmacopœia, and contains one part

in four of pure acid. Certainly this is the only solution which any chemist would be justified in dispensing as the 'solution of best medicinal carbolic acid,' and the dose of such a solution recommended by Mr. Foster, if administered to young children, could scarcely fail to prove fatal."

On the other hand, we learn from the 'Lancet' of January 23rd that Dr. Alexander Keith has given, in similar cases, carbolic acid, combined with acetic acid and opium, in doses of four to six drops, with success, the patients rather liking the dose than otherwise.

ROYAL INSTITUTION.

The first of the Friday evening meetings at the Royal Institution was held on the 15th of January, when a very large number of members and their friends assembled to hear a lecture by Professor Tyndall, F.R.S., "On Chemical Rays and Molecules."

The Professor stated that the first physical investigation of importance in which he ever took part was published under the title of "The Magneto-Optic Properties of Crystals, and the Relation of Magnetism and Diamagnetism to Molecular Arrangement," which researches had been prosecuted jointly with Professor Knoblauch. These early researches led him to reflect upon the probable architecture of the invisible atoms which build up crystals, causing him to try to penetrate a mysterious field of science beyond the direct observation of the senses, and to make radiant heat the agent to unlock some of these secrets of nature. Thus was his mind turned more especially towards that branch of philosophy known as "molecular physics;" and in the subsequent researches he often had occasion to enclose invisible vapours and gases in tubes, to watch their behaviour when submitted to the action of radiant heat. Two or three months ago, while sending an intense beam from that brilliant little artificial sun—the electric light—through a vapour enclosed in a tube, he was surprised and somewhat annoyed to see a cloudiness in the path of the rays. He was annoyed because he thought that perhaps, in previous experiments, he had ascribed absorption of heat to true transparent vapours, which absorption might in reality have been due to faint clouds in the tube. On further examination, however, he saw that there was no cloud in the tube in the first instance, but that the light itself manufactured the cloud, by setting up chemical decomposition in the vapour. He would show one of the experiments by filling the tube with nitrite of amyl vapour. (He then passed some of the common air from the lecture-room through a tube filled with cotton-wool to filter the particles of dirt out of it. The carbonic acid was next abstracted from the air by its passage through a tube filled with marble and caustic potash, and lastly, the purified air was dried by passage through a tube filled with powdered glass and sulphuric acid. The pure air was then made to bubble through nitrite of amyl, an almost colourless liquid, from which it took up some vapour, and then passed into the great experimental tube. Upon sending a powerful beam from the electric lamp through the transparent vapour, a cloud of little liquid particles was quickly formed at the end of the tube nearest the light.) With reference to this experiment, he said the vapour of nitrite of amyl should be pictured as composed of a vast number of molecules in incessant motion. Each molecule, again, is itself built up of numerous atoms, which, between the forces of attraction and repulsion, vibrate with respect to each other, to and fro over their position of equilibrium. Now, when waves of light rush against these atoms, they shake them, and accelerate their motions. Nay, sometimes they shake them rudely asunder, a new chemical substance is formed, and that substance becomes visible. Such was the case in the experiment with nitrite of amyl, for the waves broke up the vapour into a new substance, composed of small liquid spherules, which made their presence visible as cloud. The reason the cloud was seen at one end of the tube, and not at the other, was that the vapour at one end, having drunk in and absorbed all the energy of the waves, the latter had not sufficient force left to decompose the further length of vapour. He would reverse the ends of the tube by putting the transparent end next the light, and now they saw that a cloud had formed at that end also. Into another large tube he would now admit some vapour of nitrite of butyl, mixed with hydrochloric acid, and subject both to the action of the electric light. Did his hearers notice the beautiful blue, like that of an Italian sky, at once formed in the tube? He would first explain why he mixed hydrochloric acid with the nitrite of butyl. When the waves of solar light beat upon the molecules of carbonic

acid gas, which are diffused in the atmosphere, no decomposition whatever of the gas takes place, although a tendency to separation is set up between the atoms of carbon and oxygen. Now, when the gas with this tendency to change comes into contact with the leaves of trees, there is something in those leaves which decomposes the gas beneath the action of the solar rays. In this way trees get most of their food, for they often take up more from the atmosphere than they do from the soil. The nitrite of butyl is not directly decomposable by waves of light; but in the presence of hydrochloric acid gas its constitution is broken up by light, just as carbonic acid gas is decomposed by the joint action of light and vegetation. But waves in white light differ vastly in length and mechanical power, hence it would naturally be expected that when the little particles in the vapour are small, they would first be able to reflect the shortest or blue waves, so as to produce the beautiful blue seen in the tube. As the particles of the cloud accumulated other waves would be stopped till the cloud, as they now saw, became intensely luminous, and to some extent illuminated the whole theatre. The two great standing puzzles to meteorologists were the causes of the blue colour of the sky, and the polarization of the light of the sky. Supposing like conditions to be present in the atmosphere as in the experimental tube, it was evident that the blue colour of the sky might be caused by the presence of infinitely small drops of liquid, each, perhaps, millionths of an inch in diameter. Similar conditions would cause polarization of the light of the sky.

Among the afternoon lectures delivered in the Institution, is a course which was commenced on the 16th of January by Dr. Odling, F.R.S., on hydrogen and its analogues. Dr. Odling has recently been appointed the Fullerian Professor of Chemistry here in the place of Dr. Frankland, who resigned.

Obituary.

Died on the 13th December, 1868, in the 75th year of his age, Dr. Carl Friedrich Philipp von Martius, ex-professor of Botany in the University and Secretary of the Mathematico-physical Class of the Academy of Sciences of Munich, Foreign Member of the Royal and Linnean Societies of London, Honorary Member of the Pharmaceutical Society of Great Britain.

Few names among the philosophers of Germany occupy a higher place than that of this eminent *savant*, whose brilliant and versatile genius and unceasing activity enriched all branches of literature and science. Among botanists Dr. von Martius will ever be remembered as the author of a grand work on Palms, in three splendid folio volumes which it took 27 years to complete; and also for his Flora of Brazil, a work of even greater magnitude commenced in 1840 and still carried on with the co-operation of other botanists. He also wrote two small publications on Brazilian Materia, Medica and numerous papers on ethnological and philological subjects.

In private life Dr. von Martius was remarkable for his amiability and great conversational powers.

REVIEWS.

The Chemists and Druggists' Almanack, and Pharmaceutical Text-Book, 1869. London: 'Chemist and Druggist' Office, 44A, Cannon Street.

We regret that this useful publication reached us too late for notice last month. It contains, as well as the information to be found generally in almanacks, matter of especial interest to the pharmacist: as, for instance, chapters on "Weights, Measures, and Arithmetical Formulæ," by J. C. Brough, F.C.S.; "A Few Practical Hints on Dispensing and Kindred Subjects," by Joseph Ince, F.L.S.; "Photography," by the Editor; "Directions for Restoring the Apparently Drowned;" "Digest of the Principal Acts of Parliament affecting Pharmacists;" "Pharmaceutic Specialities;" "Novelties of the Year;" "Books for the Pharmacist," etc. etc. The chapters on "Weights, Measures, and Arithmetical Formulæ," and "Practical Hints on Dispensing" are of particular interest, and ought to be read carefully. Altogether we can speak highly of this little work, which all pharmacists would do well to obtain.

THE MEDICAL FORMULARY: being a Collection of Prescriptions derived from the Writings and Practice of many of the most Eminent Physicians in America and Europe, together with the usual Dietetic Preparations and Antidotes for Poisons. To which is added an Appendix on the Endermic Use of Medicines, and on the Use of Ether and Chloroform. The whole accompanied with a few brief Pharmaceutical and Medical Observations, by BENJAMIN ELLIS, M.D., etc. Twelfth Edition, carefully revised and much improved by ALBERT H. SMITH, M.D., etc. Philadelphia: Henry C. Lea. London: Trübner and Co., Paternoster Row. 1868.

The above voluminous explanatory title sufficiently indicates the character of this Formulary.

THE MODIFIED EXAMINATION OF THE PHARMACEUTICAL SOCIETY, ETC. By F. HARWOOD LESCHER.

A notice of this useful little work will be found at page 450.

BOOKS RECEIVED.

THE MONTHLY MICROSCOPICAL JOURNAL: Transactions of the Royal Microscopical Society and Record of Histological Research at Home and Abroad. Edited by HENRY LAWSON, M D., etc. London: Robert Hardwicke, 192, Piccadilly.

PHARMACOPŒIÆ RECENTIORES ANGLIA, GALLICA, GERMANIÆ, HELVETICA, RUSSIÆ INTER SE COLLATÆ. Supplementum Manualis Pharmaceutici Hageri. H. HAGER, Ph.D. Vratislaviæ, Impensis Ernesti Güntheri. London: Trübner and Co. 1869.

THE CHEMISTS' ANNUAL BALL.

The third Chemists' Annual Ball was held at Willis's Rooms, St. James's, London, on Wednesday evening, January 20th. The leading wholesale and retail pharmacies, and the 'head-quarters' at Bloomsbury were fully represented on the occasion, which was one rather of a large and thoroughly agreeable private party than a mere ball. The President, Treasurer, Secretary, and several members of the Council of the Pharmaceutical Society, some provincial friends, including a few from Edinburgh and Newcastle, and London visitors, to the number of nearly three hundred, were present.

TO CORRESPONDENTS.

Persons having seceded from the Society may be restored to their former status on payment of arrears of subscription and the registration fee of the current year.

Those who were Associates before the 1st of July, 1842, are privileged (as Founders of the Society) to become Members, and by virtue of membership to be registered as *Pharmaceutical Chemists.*

The Secretary and Registrar desires to intimate that no anonymous communications, or letters signed with initials only, will be answered.

The Pharmacy Act and Wholesale Assistants.—Sir,—Will you kindly allow me, by inserting this letter in the next number of the 'Pharmaceutical Journal,' to draw the attention of wholesale assistants to the fact that a petition has been presented to the Privy Council, praying "that the word 'immediately' may be erased from the certificate required by Schedule E, or that such other relief may be granted as will place wholesale on equal terms with retail assistants?"

In the event of this petition not proving successful, it may be advisable to address one to the House of Commons, in which case it would be well for provincial assistants to support it, either by petitioning separately, or by sending up sheets of signatures to be attached to the London petition.

The movement has met with the approval of all the wholesale firms in London, and it is believed that most of the members of the Pharmaceutical Council sympathize with the petitioners; and I trust you will further aid by making the matter more widely known.

Yours respectfully,

London, January 21st, 1869. J. C.

J. W. B. (Woodbridge).—The consistence of a soft jelly.

"*Delta*" (Wolverhampton).—We are unable to give the information required.

Paper Filtering.—A correspondent (Linlithgow), with reference to an article on this subject in the January number, observes:—A very simple, and for many practical purposes, a very satisfactory plan, occurred to me lately, and I find it work remarkably well. I do not allow the paper to touch the glass at all, or as little as possible; and this is about all that can be done for the perfecting of a paper filter. This is managed by introducing into the filter a coil of thin wire, formed into a cone roughly corresponding to the inside of the filter. I say *roughly*, because were it too nicely done, the wire might lie close to the glass. Iron wire does well enough for many things, but silver, platinum, or any other metal may be substituted. I tried a sort of cage with upright ribs, these allow the paper to clap close to the glass. Very neat "filter-holders" could be made on this principle, and I hope to see them shortly for sale.

A. G. P. (Longton).—Certainly not.

J. B. Smith (Dulwich).—(A.) Inquire of Baillière and Co., 219, Regent Street. (D.) The same. (B.) Probably *not*, seeing that we have already an abundance of books on chemistry in English. (C.) Inquire of Dr. Redwood, Dr. Odling, or Professor Frankland.

E. M. (Apothecaries' Hall).—(1.) "All poisons:" those mentioned in the schedule are intended. (2.) Of course, in selling any poisons not included in the schedule, all reasonable precaution should be used. (3.) "Cantharides" does not, according to the Act, include the preparations of cantharides.

W. P. (Upper Norwood).—We imagine the article referred to would be included.

Mr. E. G. Carrington (Bakewell) gives the following as a simple way of making aq. menth. pip., which he thinks answers as well as the Pharmacopœia process by distillation:—Magnes. Carb. 4 drms., Ol. Menth. Pip. Ang. 45 mns., Aq. destill. 4 oz. Pour the oil of peppermint on the magnesia, and rub up with a portion of the water. Transfer to a paper filter, and add gradually the remainder of the water until the whole has passed through.

"*Pharmaceutist*" (Nuneaton) and *Mr. W. Price* (Birmingham) are thanked for their communications.

G. M. (Southampton).—The practice complained of is clearly illegal.

X. Y. (France).—The provision applies only to this country.

"*Inquirer*" (Dartford).—(1) see Vol. IX. (N.S.) p. 496; (2) not necessarily; (3) we know of no means of doing it.

"*A Correspondent.*"—Syrup of phosphate of iron and quinine with strychnia. See Vol. X. (N.S.) p. 111.

Liquor Ferri Perchloridi Fortior.—The phenomena alluded to by a "Registered Student," who refers to the bursting of a bottle containing the above-named solution, were, no doubt, due to the fact that, in making the solution, the decomposition of the nitric acid and evolution of nitrous fumes had not been completely effected.

"*H. I.*"—Having passed the Modified Examination, and been registered as a Chemist and Druggist, a man will be eligible for admission to the Society as an Associate. Read attentively Section 20 of the new Pharmacy Act.

"*Walker*" Holborn.—(1.) We are not aware that a new edition of the work is contemplated. (2.) Yes.

Scroggins, Giles (Bishopwearmouth).—You will find coloured drawings of the plants referred to in Churchill's 'Medical Botany' and in Woodville's 'Medical Botany.' Both works may be seen in the Library of the Pharmaceutical Society.

R. S. P.—(Ilkeston).—The articles mentioned can be sold only by persons registered under the Act.

A Correspondent suggests that it would be a great boon to students if some enterprising firm would publish coloured drawings of the seven plants required to be recognized at the Modified Examination.

Instructions from Members and Associates respecting the transmission of the Journal before the 25th of the month, to ELIAS BREMRIDGE, Secretary, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Messrs. CHURCHILL, New Burlington Street. Other communications to the Editors, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. X.—No. IX.—MARCH, 1869.

PREPARING FOR EXAMINATION.

In an article headed as above, we endeavoured last month to encourage a somewhat numerous class of young men, who have been suddenly placed under difficulties, to adopt what we believe to be the best course to enable them to fulfil what the law now requires, and what would tend to their permanent advantage. The advice we have there given was not offered unsolicited, nor was it lightly or unadvisedly offered. It represents convictions long formed, much of the substance of which has found expression from time to time in the pages of this Journal from its first appearance until now, and we ask for an attentive perusal of it with a view to its practical application, if deemed worthy, for advancing the interests of those to whom it is addressed.

While the system of education and examination which was introduced by the Pharmaceutical Society in 1842 continued a voluntary system, it was desirable and indeed necessary, that the test of qualification should be uniformly applied, and should indicate as high a standard of proficiency as the circumstances of those who came under its influence would admit. The men who availed themselves of systematic and scientific education and passed the required examinations were recognised as qualified men, and took a position accordingly. In the interests of these men, and of the system which, as a voluntary system, could not be otherwise maintained, it was necessary to guard against the lowering of the standard to meet special cases. No exceptions were admitted, nor were they required; and those who failed to come within the boundary-wall of examination remained as outsiders, but retained the legal right to exercise the business to which they had been trained, and in which they had acquired a vested interest.

It has often been our duty during the last quarter of a century to urge upon students of this class the importance of their pursuing their studies in such a way and to such an extent as to make the knowledge so acquired a permanent acquisition, which would prove a valuable investment of the cost of instruction. We have thus pointed out that the best and only thoroughly sound method of studying the subjects involved in a pharmaceutical qualification is the practical method. For botany the gardens and fields, for chemistry the laboratory, for Materia Medica the drawers and bottles. But neither gardens and fields, nor laboratory, nor drawers and bottles, would avail alone. There must be the guide and instructor to point out what to observe and what application to make of the observed facts. Hence the necessity for the tutor, the lecturer, or the book, and as personal instruction is much more effective than that derived from reading, the latter without the former can only be recommended where the other

cannot be obtained. So much has been said from time to time in recommendation of the more efficient means which for many years past have been provided for students who could happily make full use of them, that the less efficient means which alone are available for less fortunate youths have received but slight notice, and perhaps have too often been referred to disparagingly.

But, as stated at the commencement of the article referred to, we have now entered upon a new era; the voluntary system is at an end, and a change has come suddenly and unexpectedly upon a large number of men of all ages and of various terms of experience as chemists and druggists, who find themselves in danger of being excluded from the business of their adoption, to which they have devoted, it may be, many years of their lives. We refer to those who are either apprentices or assistants without certificates of qualification, or adequate means for acquiring them in the usual way. The law says that these men shall not be allowed to carry on the business to which they have been wholly or partially trained, and for entering which they have most of them paid apprentice fees, unless they pass an examination. If the law had existed before they entered the business, there would have been no hardship in this; but if, without previous notice, they are now called upon for a qualification which they have not the means of acquiring, they certainly have some ground for complaint and a strong claim for assistance. The Pharmaceutical Society recognized the claims of these men for special consideration in framing their Bill, which, as introduced into Parliament, exempted most of them from the necessity of passing any examination; and the Legislature, although not to the same extent, yet to some extent, has acted on the same principle by admitting some of them to a Modified Examination.

Now, these are the men to whom we addressed our remarks last month. As the law stands, those who at the passing of the Act were of full age, and had for three years been engaged in dispensing medicines for a chemist and druggist, are admitted to an easy examination; but those who do not come within that definition must pass the ordinary examinations of the Society. In both these classes we have reason to believe there are very many who have no other means of preparing for examination than those which books and specimens supply for self-instruction. Having been appealed to on behalf of this class, we have endeavoured to give them such advice and assistance as a long and not unsuccessful experience has taught us to believe would best serve their purpose and advance their interests. To have told them to attend lectures where none exist, or that they should repair to London for attendance at a practical school while they lack the means of doing so, would simply have been to make a mockery of their misfortunes.

Our object has been to show the necessity for systematic study in preparing for examination, whatever the nature of the examination may be; to show the importance of starting with a clear conception and well-considered plan of what is to be accomplished, and to indicate the means best suited for the attainment of what is required by those who, from circumstances over which they have no control, are limited almost entirely to the use of books, and such simple aids as may be obtained at small cost. There are many instances of good results obtained with even these limited means, but it must be by proceeding in the systematic way we have pointed out. To pursue the simile we have already used, the building should be constructed according to some plan, the materials should be well selected, and put together with judgment on a sound foundation. It is thus, and thus only, that a permanent and useful structure may be raised, be it a palace or a less pretentious edifice.

As regards the nature and importance of the work to be done, and the method by which it may best be accomplished, we have nothing to add to or alter from what we stated last month; but we wish it to be understood that the

purpose and scope of our remarks refer to circumstances of present existence, which in the natural course of events will be of short duration.

THE PETROLEUM ACT.

The publicity that has been given to the provisions of this Act, and the advertisements which have emanated from local authorities by whom licences are granted for dealing in petroleum, have created a good deal of excitement, and caused much apprehension of unnecessary and troublesome interference with the sale of products that are supplied to the public by chemists and druggists. As stated by us last month, the term petroleum, in the sense in which it is used in the Act of 1868, includes the more volatile products obtained by distillation from coal and other bituminous substances as well as crude petroleum. Among the volatile liquids thus brought within the definition of the term is benzol, or benzine, an article of Materia Medica ordered in the Pharmacopœia, and occasionally used in medicine, but more extensively used for removing grease spots, for cleaning gloves, and for other similar purposes, also as a solvent of gutta percha, and the menstruum of varnishes used in photography and the arts. Some of the more volatile hydrocarbons obtained from petroleum, although not identical with benzol, are used for similar purposes, and the most volatile of them have received some special applications in medical practice, their great volatility having indicated their use in the production of insensibility by the spray. Now, these volatile liquids are all clearly included under the term petroleum as interpreted by the Act, and no exception is made of any of them from the operation of the provisions of the Act; but it can hardly be supposed that the regulations which have been introduced were intended to apply to such liquids when sold in small quantities, or kept for medicinal use by chemists. We expressed this opinion in a qualified way last month, but have hesitated to do so more strongly until an opinion could be obtained from some competent authority. Since then a deputation, consisting of the President of the Pharmaceutical Society, with some members of the Council and officers of the Institution, and accompanied by Mr. Thomas, the proprietor of benzine collas, and Mr. Sanger, the patent medicine dealer, have had an interview with the Under Secretary of State at the Home Office, when the subject was fully discussed in its various bearings. Mr. Liddell, the Under Secretary, stated more than once that he did not think the Act was intended to apply to small quantities of benzol or other similar liquids when kept and sold by chemists for purposes such as were explained by the deputation, and are referred to above.

The views entertained by the deputation were submitted to the Secretary in the following form:—

"That the Petroleum Act, 1868, in the form in which it was introduced by Sir James Fergusson and Mr. Gathorne Hardy, was intended for regulating the storage and sale of certain volatile oily products obtained by distillation from natural petroleum, or from coal, or other bituminous substances, and which are used as cheap substitutes for fixed or non-volatile oils for burning in lamps.

"That in the Bill, as originally introduced and printed, the 5th section stated, 'no person shall sell or expose for sale *for the purpose of being used in lamps, or otherwise for the production of artificial light*, any description of petroleum,' etc., thus showing that the provisions of the Act were intended to apply to petroleum and other analogous bodies when used as lamp oil.

"That it has been from the use or supply of petroleum for this purpose that dangerous accidents have occurred, and these have generally arisen from ignorance, on the part of those using the petroleum, of its volatile nature, and of

the inflammability of its vapour, the petroleum having been sold and used as a substitute for non-volatile lamp oils, and no other precautions having been adopted with reference to it than such as experience had shown to be sufficient in the case of ordinary fixed oils.

"That in the alterations made in the Bill as it passed through Parliament, the words limiting the provisions of the Act in the 5th section to the sale of petroleum *for burning in lamps*, were omitted, so that the whole of the provisions of the Act now apply to all substances, and they are numerous, that come within the meaning of the term petroleum as defined in the Act.

"That this alteration, it is believed, was made without due consideration of some of its practical bearings.

"That the term petroleum, within the meaning of the Act, applies to the liquid called benzol or benzine, which is extensively used for removing grease spots, cleaning gloves, and other similar purposes, and that other products which are used in medicine and the arts, also come within the meaning of the term.

"That these products are sold by chemists throughout the country, and that their storage, sale, and use are attended with no more danger than is common to many other equally volatile liquids, which the public have long been accustomed to use without accident, although no regulations have been made for their sale.

"That the provisions of the Petroleum Act, as now applied to the storage and sale of lamp-oil petroleum, are unsuited and inapplicable to the conditions under which the other liquids referred to are frequently required to be sold.

"That it would be considered a great hardship for every chemist who sells a bottle of scouring drops, or other similar and equally harmless preparation, to be obliged to obtain a licence for doing so, and to comply with regulations which in such cases are quite unnecessary, and would entail great inconvenience."

Although nothing positive was elicited at this interview, the impression produced on those present was that Mr. Liddell entirely agreed with the deputation in the opinions expressed in the memorial. He promised to lay the subject before Mr. Bruce, the Home Secretary, and said he thought it very unlikely that retail chemists would be interfered with for selling or using benzol in small quantities, either as scouring drops or for medicinal purposes.

SALE OF POISONS.

In an interesting paper read at a meeting of the "London and Middlesex Archæological Society" lately, on the "City Friends of Shakespeare," Mr. Orridge, always zealous for the honour of his order, tries to establish a connection by marriage between the great poet and a firm of "grocers and druggists" (John Sadler and Richard Quiney), carrying on business at the Red Lion, Bucklersbury. We thank Mr. Orridge for giving us this connecting link, but we are more concerned perhaps with what follows. In those days, he says, the "*grocers seem to have been the druggists of the period; they probably merely provided drugs for the manipulation of the apothecary, or, in other words, there were no professional pharmaceutists, pharmacy as a science being comparatively unknown.*" Of this we believe there is pretty good proof in the old charter of the "Grocers" or "Pepperers," through whose hands imported drugs passed to the public in England.

Things are much changed now, and as a rule grocers no longer dabble in drugs. Increase of population necessarily leads to subdivision of labour and trade; men who are to exercise one calling naturally concentrate their attention on the subjects specially connected therewith, and the public soon learn to ap-

preciate the value of technical knowledge. Therefore, where there is sufficient population to support a druggist, a druggist locates himself, and the public wanting pills feel a greater security in purchasing them at a shop showing coloured bottles in its window than they would if a row of tea-chests and sugar-loaves denoted the leading wares to be obtained thereat. But even this security loses its value as all things progress. and the mere exhibition of a red bottle is in itself insufficient guarantee of fitness to dispense medicines. As surely as a superiorly educated man works behind those brilliant bottles which first attracted his customers, so surely will that special shop become more attractive, and colours just as brilliant lower down the street, not backed by a qualified man, will cease to lure the valetudinarian. We may commend this fact even to men who obtain registration under the new, or even under the old, Pharmacy Act. The certificates of examination which must hereafter be possessed by all who call themselves Pharmaceutical Chemists or Chemists and Druggists, will come into competition with other like certificates, and one will pale before another, even as the symbolic bottles we have mentioned, unless there be a practical aptitude on the part of the possessor to fulfil the duties which he has evinced theoretical education enough to obtain.

We may especially urge this as an answer to many correspondents who ask us, wherein a man will be benefited by working up to the highest standard when a lower would secure for him all trade privileges? It is manifest that even the working up itself must assist in training a man for his future practice. We believe as a rule the public will seek out the best qualified to supply their wants in a matter so important as physic—an article at once of the utmost value and the utmost danger. But there are even in this nineteenth century, as there were in the sixteenth, some remote places where the grocer, or rather the huckster, has up to this year been resorted to for the minor medicaments, and among them some drugs even which are now forbidden to be sold except by registered persons. The habits of the people in some districts have caused certain poisons, more particularly opium, to be regarded as a necessity; common use has deprived it of its dangerous reputation, and it has been seemingly as reasonable to buy a quarter of an ounce of opium at the village shop as a quarter of an ounce of tea. The sale of it has consequently been a not unimportant source of profit to these small traders. The Pharmaceutical Society felt all this as a difficulty in framing the Pharmacy Act, and accordingly omitted opium in the schedule of their draft Bill; this omission was, however, overruled, and opiates were inserted ultimately with extra stringency—a stringency, indeed, which seems ridiculous to practical men. No wonder then, that many village shopkeepers who had not the slightest pretension to call themselves "Chemists and Druggists" according to the requirements of Section 3, should have applied for registration and been refused. No wonder either if many such should have found means to obtain the signature of persons qualified to give certificates, and, presenting what was to all appearance true and good proof of title, have obtained registration. This, however, is an error which will soon correct itself. When the register which will ere long be in the hands of every local secretary of the Pharmaceutical Society appears, these improper entries will be pointed out to the registrar, and the names of persons so improperly registered will be, on due evidence, erased,—the persons themselves, as well as those who falsely assisted in procuring their registration, being liable to severe penalties under the Act. Year by year the register will be purged of its impurities, and the whole benefit of recent legislation be secured as well for the public as for chemists.

We cannot but regard this extra stringency in the matter of opium and poppies which was imported into the Bill, although resisted by its promoters to the last, as a most unfortunate addition. A chain is but equal in strength to its

weakest link; and this, the weakest link in the Poison Act, has to bear the strongest efforts to break it. We had hoped long ere this, as indeed we stated two months ago, that mitigating regulations would have been issued by the Pharmaceutical Society, with the concurrence of the Privy Council, which would have rendered this matter easy; but the question is still delayed, and we are inundated with letters on the subject too numerous to publish. Some of them tell us of notices appearing in small shop-windows that "*The Paregoric sold here is not of the poisonous nature of that sold by the Chemists!*" Others of a lump of opium being put into a box, labelled "Opiate Mass," and stamped as a patent medicine. Others again, of laudanum being so sold by hawkers. In this latter case we believe a prosecution has already been instituted by the police. As to the paregoric notice, we may laugh at it. We cannot believe the Legislature would seriously order paregoric to be marked poison, unless they had a design on the very word "Poison" itself, for assuredly it would be utterly destroyed by such false use, and we only take paregoric as a type of the articles about which there is difficulty; but on the opium and laudanum, which are to all intents and purposes poisons and highly dangerous, we hold other views, and are clearly of opinion that such transparent evasions will not go unpunished.

From what we hear now it seems this question of "regulations" is in abeyance because it is thought that "Preparations OF Opium," and "Preparations CONTAINING Opium" are two distinct classes, and we believe it is under consideration of counsel whether they cannot be so treated. Of course this would be by far the best solution of the question, and the inconvenience of the delay which has occurred would be fully compensated by such a termination.

THE PHARMACY ACT AND MEDICAL PRACTITIONERS.

We may congratulate ourselves that the opinion we expressed as to the action—or rather the non-action—of the Pharmacy Act on medical practitioners has been confirmed by that of the Scotch legal authority which appeared in a former number of this Journal, and by another obtained by the British Medical Council, which is reported in our present issue.

THE BRITISH PHARMACOPŒIA.

It appears that of the 20,000 copies of the Pharmacopœia which were printed about two years ago, 18,000 have already been sold, and that a reprint (not a new edition) will shortly be required to supply the continued demand. In reprinting the work no alteration, we understand, will be made, beyond the correction of a few typographical errors.

IN THE FUTURE.

"Nullum est jam dictum, quod non dictum sit prius."

There are usually two sides to most questions, and not unfrequently it would be quite consistent with equity and fair dealing if plaintiff and defendant were to change places.

Hints to pupils and apprentices, like advice to those about to marry, have been as plentiful, to use a homely saying, as blackberries, and a common theme

for writers; therefore a few words in the other direction may not be altogether out of season. Youth is more prone to pleasure than work, can better appreciate the enjoyment of a game of cricket or football, than the possible advantages to be gained in the future by present work and study, and it is a fact and no wonder, that as a rule, the young require some inducement to study, either by hope of reward, dread of punishment, or the good example of those who have the management of them; that there is a difference in teachers as well as pupils none will venture to deny. One man brings his pupils on while they drag after another; one by his own love for the work, and a happy way of making it look like pleasure, creates a feeling similar to his own, a relish for the task, whilst another can scarcely keep alive the dying embers. Turning to a matter more immediately interesting, is it not equally so in business, and do not masters and apprentices afford a parallel case? perhaps I ought to write proprietors and pupils. Now the subject which I am desirous of considering has always appeared to me a very important and serious one, and at this particular juncture more than usually so: whenever any one takes a youth into his establishment to be taught the art and mystery of his business, it is a most serious responsibility that he incurs. He undertakes to give him such instruction as will enable him at some future day to carry on business for himself or others, and not simply to buy and sell, but to the best of his abilities to carry it on successfully; if the consideration of this were important when no actual standard of qualification was required, how much more so must it be now that examination is compulsory, and much, and how much, of a young man's future depends upon the manner in which the ordeal is passed? I feel that I am treading upon delicate ground, and I do it with all deference towards those who are my seniors in many respects; but in asking for the future, it is almost impossible to steer clear of the past. Have masters hitherto felt, and do they now feel, to the fullest extent what is due from them to their apprentices, to the youths whom they have taken into their homes, and with whom they have received a money consideration? I see before me visions of many ghosts taking the shape of questions and answers which reply freely and loudly, No! I am not about to enter upon the oft-repeated subject of early closing, and hours set apart for study, but rather upon some of the realities—the every-day dry realities—of life in the pharmaceutist's establishment.

It would be out of character if it should be said that a master ought to teach his apprentice orthography, arithmetic, and Latin; but would it not be well if before taking him into a business where a knowledge of these is essential, he ascertained that he possessed at least as much of each as was requisite, and in after days encouraged him in keeping it up. It could scarcely be expected that he would teach him chemistry from a scientific point of view, but he might urge the necessity of being able to recognize specimens, of becoming acquainted, theoretically at least, with the pharmacopœia processes, and, practically where possible, explain to him the certain changes, for chemistry deals in facts which occur in simple decompositions, and the ordinary tests for distinguishing good from bad. Again, amongst the drugs, such as roots, barks, fruits, gums, resins, etc., he might so instruct him during four or five years that he would know almost any of them by sight, and from this, the desire for a more intimate knowledge would arise; hence the question of habitats and natural orders would follow, leading on to the most interesting subject of botany, in which the recognition of the ordinary indigenous or commonly cultivated medicinal plants would naturally become a matter of inquiry, passing to elementary structure, organs of nutrition, and parts of a flower; and thus would spring up a lasting and enduring spirit of inquiry, and the industrious, painstaking, knowledge-loving youth would be led on to read and extend his fund of information until at last the instructor may find that he must rub up to keep pace with the rising generation.

Touching more intimately upon pharmacy, it is not to be imagined that every pharmaceutist would make all the extracts, tinctures, plasters, pill masses, powders, distilled waters, and spirits; but once or twice every year some green extract might be made, and a principle established, and even where distillation forms part of the process, as in Ext. Jalapæ; tinctures can be prepared, and compound powders mixed and sifted by every one, and there are very few galenicals that could not be made now and again for the instruction of pupils. Thirty years ago and more, when no Pharmaceutical Society existed—when there was no compulsory Act of Parliament, there were masters who, with no laboratory but such as a back kitchen afforded, taught their apprentices to the best of their abilities the real rudiments of pharmacy, not omitting the preparation of sal volatile, spirit of nitre, and all the other things before mentioned. How much more desirable and profitable for a youth to be thus engaged than wasting much valuable time, looking out of window! Such teaching will not unfit him for that which in the coming future must follow; on the contrary, he will take more kindly and with more appreciation to the lectures upon chemistry and botany, and practical working in the laboratory. Enough has been written to remind those who are willing to take upon themselves the instruction of future pharmaceutists, of some facts of which hitherto they may possibly not have thought; on the other hand, it may perhaps be urged that in many instances the premium paid with, or the kind of service required of, apprentices has not been of a nature to warrant so much instruction; *in the future* the demand will be imperative, therefore the sooner it begins the better. A word or two to the young: to those commencing work, to remind them that they can assist the teacher, the seed will not germinate and bear fruit upon barren and uncultivated ground, the soil must be good and kept well weeded; listlessness or indifference must be rooted out, pride and mock modesty banished, be not afraid, at least whilst young, of seeming ignorant by asking questions; nip in the bud carelessness, want of order, and procrastination; expect not too much from books and hours for study,—a good book is a good, honest companion, speaking the truth without fear of offence, but it should follow, not precede the teacher. Ten years ago I pointed out much that is now taking place, as the following extract from the Journal will show, Vol. I. p. 371, N.S.:—

"And it appears to me imperative upon every one, whether he be a member of the Pharmaceutical Society or not, taking an apprentice, to point out to his friends the fact of the demand for an increasing educational qualification, and the probability of further expenditure; and at the same time should in justice advise him to enter himself upon the books of the Pharmaceutical Society, for assuredly that Society will continue to increase and extend its influence; and whether education be voluntarily or compulsorily directed, it will ever make its way, and compel those who desire or hope to obtain pre-eminence to bow to its influence and become its followers." Time has not changed this opinion, and *in the future* it will grow stronger and stronger.

A. F. Haselden.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *February 3rd*, 1869,

MR. T. H. HILLS, TREASURER, IN THE CHAIR.

Present—Messrs. Abraham, Bottle, Bourdas, Brady, Carteighe, Deane, Edwards, Haselden, Hills, Ince, Morson, Orridge, Randall, Sandford, Savage, Squire, Stoddart, and Williams,

The following Pharmaceutical Chemists were elected

MEMBERS.

Blake, Charles.....
Grieves, Austin Stirling.....Birmingham.
Hatch, Richard Melancthon .....Bristol.
Laurens, Frederick Lemprière .....Monkwearmouth.
Padwick, Thomas .....Wandsworth.
Selfe, William Gilbert .....London.
Strawson, George Fredreck .....London.
Ward, William .....Sheffield Moor.
Welborn, George.....Grantham.

The following, having paid their arrears and their subscription for the current year, were restored to Membership :—

Fingland, James .....Wavertree.
Maunder, Frederick .....Sheffield.

The lot for the next Council having been taken in the usual manner, the following were declared to go out of office, but are eligible for re-election :—

Bottle, Alexander, Dover.
Bourdas, Isaiah, 7, Pont Street, Belgrave Square.
Brady, Henry B., Newcastle-on-Tyne.
Carteighe, Michael, New Bond Street.
Deane, Henry, Clapham.
Evans, Henry Sugden, Bartholomew Close.
Haselden, Adolphus F., 18, Conduit Street.
Hills, Thomas Hyde, 338, Oxford Street.
Ince, Joseph, 26, St. George's Place, Knightsbridge.
Mackay, John, Edinburgh.
Morson, Thomas N. R., 38, Queen Square.
Sandford, George Webb, 47, Piccadilly.
Standring, Thomas, Manchester.
Stoddart, William Walter, Bristol.

The following Members were declared to remain in office for the ensuing year :—*

Abraham, John, Liverpool.
Edwards, George, Dartford.

* Bye-laws, sect. 5, clause 3 :—"Any person qualified to vote desirous of nominating any Member for election as a Member of the Council or as an Auditor, shall give notice in writing with the name and address of the nominee, and if for the Council disclosing whether such nominee be or not a Pharmaceutical Chemist, to the Secretary of the Society, on or before the 24th day of March in every year."

ORRIDGE, BENJAMIN B., 32, Ironmonger Lane.
RANDALL, WILLIAM B., Southampton.
SAVAGE, WILLIAM DAWSON, Brighton.
SQUIRE, PETER, 277, Oxford Street.
WILLIAMS, JOHN, 5, New Cavendish Street.

Richard Bremridge was appointed Assistant-Secretary.

BENEVOLENT FUND.

The Treasurer was ordered to purchase £150 Consols, making the sum now invested to £10,000.

The sum of £20 was given to a distressed applicant, late Member of the Society.

The sum of £21 was handed by the Stewards of the Chemists' Ball as a donation to this Fund.

EXAMINATIONS IN LONDON.

January 29th, 1869.

MODIFIED EXAMINATION.

Present—Messrs. Bird, Carteighe, Cracknell, Darby, Davenport, Deane, Edwards, Evans, Gale, Haselden, and Southall.

Forty-two candidates presented themselves; the following thirty-three passed, and were duly registered as

CHEMISTS AND DRUGGISTS.

Badham, Lewis .....Wingmoor.
Borman, Richard William .....London.
Brown, Edward .....London.
Buck, Thomas .....Chelmsford.
Butcher, George .....Bow.
Cape, John Sweet .....Plymouth.
Clarke, Thomas Watson.....London.
Dickinson, William.....Manchester.
Diggens, Edward Daniel .....Coddenham.
Eyre, Henry Reynolds .....Ipswich.
Goddard, Alfred .....Tisbury.
Handford, Henry .....Barnstaple.
Handley, George Frederick .....London.
Handley, Thomas .....Tibshelf.
Hicks, Sidney Blackett .....London.
Hill, Edward .....Barnstaple.
Hughes, Arthur Elijah .....Ripley.
Hughes, Jacob.....Liverpool.
Jackson, Henry Frederick .....Stamford.
Jamson, William Samuel .....Lincoln.
King, Alfred .....London.
Lloyd, John.....London.
M'Gavin, John .....Preston.
Michelmore, Philip William .....Totnes.
Mitchell, Marcus.....London.
Morgan, William Hitchings .....Cardiff.
Osborne, Thos. Carwardine Edwards .Malvern.
Parlby, Henry Hugh .....Woodhouse.
Perks, Edward Cloudesly .....Hitchin.
Read, Frederick .....Birmingham.
Smith, David .....Oxford.
Thomas, Thomas Edward .....London.
Winn, Henry .....Leeds.

February 5th, 1869.

MODIFIED EXAMINATION.

Present—Messrs. Bird, Cracknell, Darby, Davenport, Deane, Edwards, Gale, Garle, and Haselden.

Forty-seven candidates presented themselves; the following thirty-nine passed, and were duly registered as

CHEMISTS AND DRUGGISTS.

Ashby, William .....Nottingham.
Barrow, Francis Clarke .....London.
Bell, Charles Christopher .....London.
Brown, Joseph.....Wavertree Road, Liverpool.
Butler, Alfred Bulteel .....Maidstone.
Downing, Frederick George .....London.
Earee, Walter Langley .....Westerham.
Embleton, Bradley .....London.
Goodson, Jabez .....Maidenhead.
Howell, Henry.....Bristol.
Humphreys, Thomas Brigstocke .....London.
Jones, Samuel George.....London.
Knott, Samuel.....London.
Laing, John Stewart .....Lewisham.
Lingwood, William.....London.
Lucas, Charles.....London.
M'Nay, Thomas .....Wavertree.
Miles, Frederick John .....Newcastle-under-Lyme.
Morgan, Philip Henry .....Bristol.
Morgan, William.....London.
Phillips, John Philip .....Oxford.
Place, John .....London.
Pond, Benjamin Charles.....London.
Potter, Fanny Elizabeth.....Kibworth.
Price, John Rhys .....London.
Richards, John .....Aberdare.
Scaman, Newcome .....Laceby.
Sheel, Robert .....Rugeley.
Smith, George Henry Charles .....Salford.
Smith, William .....Bermondsey.
Stephenson, James Neat.....Glossop.
Steward, Augustus .....London.
Sursham, Frederick Thomas .....London.
Thirlby, William.....Derby.
Warhurst, John .....Nottingham.
Watford, Charles Henry.....London.
Wing, George Newton .....Melton Mowbray.
Winship, James .....London.
Wise, William.....Helston.

February 12th, 1869,

MODIFIED EXAMINATION.

Present—Messrs. Bird, Cartcighe, Cracknell, Darby, Davenport, Deane, Edwards, Evans, Gale, Garle, and Haselden.

Forty-seven candidates presented themselves; the following thirty-six passed, and were duly registered as

CHEMISTS AND DRUGGISTS.

Baker, Harry .....Evesham.
Blanchflower, John Coleman.....Canterbury.
Burnett, James Julius .....Ipswich.

Clarke, William Lane.....London.
Cottrill, John White .....London.
Dickins, Joseph .....Leeds.
Diggle, Thomas .....London.
Draper, James Henry.....Trowbridge.
Drew, Samuel Kingdon .....Liverpool.
Drury, Morris Hayward.....London.
Ellis, Alexander .....Skelton in Cleveland.
Evans, Roderick .....London.
Floyd, John.....Liverpool.
Hothersall, John.....Bolton.
Jackson, William Frazer .....London.
Jones, John .....Cilsane, near Llandilo.
Keall, Holmes .....Bury St. Edmund's.
Lawley, William .....Kidderminster.
Lugar, Henry ..... London.
Lynn, Sam .....Stroxton, Grantham.
Mellor, Joseph.....Leighton Buzzard.
Miles, Frederick George.....Thame.
Muffitt, Joseph.....London.
Orpin, Stephen Stokes.....London.
Phillips, George Walter.....Chatham.
Pridgeon, Henry Pacey .....London.
Read, Charles .....London.
Seaman, James Saunders .....Great Marlow.
Shirtliff, William.....London.
Sneyd, William .....Walsall.
Stevens, William Goyne .....Brighton.
Swift, Charles Edward .....Preston.
Thompson, Alfred .....Dover.
Toone, John Alfred..... .....Clifton.
Williams, Richard William .....Liverpool.
Yorath, Christopher .....London.

February 17*th*, 1869.

Present—Messrs. Bird, Carteighe, Cracknell, Darby, Davenport, Deane, Edwards, Evans, Gale, Garle, Hanbury, and Haselden.

Twenty-four candidates presented themselves for the Major and Minor Examinations; the following sixteen passed, and were duly registered:—

MAJOR (as a Pharmaceutical Chemist).

Johnson, Samuel Ebenezer .....Lincoln.

MINOR (as Chemists and Druggists).

Beard, James Collins .....London.
Bell, Richard Edward .....Brighton.
Bray, William .....London.
Calvert, Robert .....Stokesley.
*Collins, Frederick Octavius .....Chard.
*Denney, Edwin James .... Norwich.
Ferguson, William Kennedy .....York.
*Francis, Thomas.....Carmarthen.
*Gibbs, James .....Bedford.
Gittings, Alfred .....Tipton.
James, William .....Northampton.
Newman, Joshua Booth.....Wolverhampton.
Robins, Harvey .....London.
Schiemann, Ernest .....Königsberg.
*Swingburn, Richard Henry .....Witney.

* Passed in honours; eligible, at the end of the Session, to compete for the Prize of Books.

REGISTERED APPRENTICES AND STUDENTS.

Name.	Address.	
Askew, Hugh de Bosco	Mr. Mason	Workington.
Atkinson, Henry B.	Mr. Siddall	York.
Ayre, Henry Mills		Morpeth.
Banister, Charles John Fraine	Mr. Marris	London.
Basden, Chas. Edward Boorne	Mr. Gostling	Diss.
Baxter, William, jun.	Mr. Baxter	Wisbeach.
Bettle, Joseph Alfred	Mr. White	Bedford.
Betty, Robert	Mr. Betty	London.
Blackmore, Peter Ludgate		London.
Brown, George Matthew	Messrs. Perfect and Spurling	Landport.
Cooper, Anthony Vincett	Mr. Palmer	Birmingham.
Green, Charles Henry	Mr. Bell	Hastings.
Green, George Thomas	Mr. Speechly	Bishop Stortford.
Harrison, John		Keswick.
Harrison, Matthew	Mr. Sykes	Southport.
Harrold, Charles Jesser	Messrs. Harrold and Son	Frome.
Hutchinson, George Bassett	Mr. Gwatkin	Brighton.
Keightly, Joseph	Mr. Bennett	Tunstall.
Lloyd, Frederic W. W.	Mr. Jones	Rhyl.
Mason, Jonathan	Mr. Mason	Workington.
Moody, Thomas	Mr. Bass	Nottingham.
Morris, Evan	Mr. E. Burden	London.
Pasmore, Walter Frank	Mr. Pasmore	London.
Peat, Joseph	Mr. Mason	Workington.
Pechey, Thomas P.	Mr. Fawcett	Birkenhead.
Penfold, Harold		London.
Richmond, Robert, jun.	Mr. Richmond	Leighton Buzzard.
Ryley, James	Mr. Walker	Louth.
Saunders, Arthur	Mr. Sangster	London.
Smith, James W.	Mr. Beall	Cambridge.
Stables, Walter Banks	Mr. Rimmington	Bradford, Yorkshire.
Topham, William	Mr. Slater	Stone.
Walker, John Sydenham	Mr. Cockshott	Manchester.
Walton, George	Mr. Owen	Highbury.
Watmore, James	Mr. Bosley	Wokingham.
Wilson, John Herbert	Mr. Cole	Lee, Kent.
Woodhouse, George	Mr. Cocking	Ludlow.

February 19*th*, 1869.

MODIFIED EXAMINATION.

Present—Messrs. Bird, Cracknell, Darby, Davenport, Deane, Edwards, Evans, Gale, Garle, Haselden, and Southall.

Forty-four candidates presented themselves; the following thirty-two passed, and were duly registered as

CHEMISTS AND DRUGGISTS.

Anderson, Charles William	Southampton.
Barnes, Edward Walter	London.
Burkinshaw, William Thomas	Tickhill.
Carlton, Edwin Preston	Derby.
Coates, Edwin	Bath.
Cox, Oliver	London.
Cregeen, James Henry	Camberwell.
Davies, John H.	Liverpool.
Eaton, John	Lichfield.
Gee, Stacey Thomas	Whitehaven.

Godfrey, Henry Edwin .....London.
Gould, Francis Charles .....Tunbridge Wells.
Greenwood, John .....Clapham.
Harrison, Joseph James.....London.
Hartshorn, Albert .....London.
Hawkins, Thomas .....London.
Howe, Henry Albert .....Stony Stratford.
Jones, Joseph .....London.
Jones, Robert .....Maidenhead.
Keeley, Robert Herbert.....Brighton.
Kington, John .....Scarborough.
Lloyd, Thomas Edwin .....London.
Moule, William .....Bristol.
Pegler, Arthur .....Lower Norwood.
Rawlings, Charles James .....London.
Read, Richard.....Richmond, S.W.
Rix, William .....Eltham.
Romans, Thomas .....Wakefield.
Stedman, Alfred John .....London.
Stickler, Francis Miles .....London.
Varley, William Mason.....Congleton.
Vernon, Andrew.....Southampton.

EXAMINATION IN EDINBURGH.

February 10*th*, 1869.

Present—Messrs. Ainslie, Aitken, Brown, Buchanan, Kemp, Mackay, and Young.

MAJOR (registered as a Pharmaceutical Chemist).

Ball, George Stephen.....Leicester.

REGISTERED APPRENTICES AND STUDENTS.

NAME.	ADDRESS.	
Purdie, Robert	Messrs. Macfarlane and Co.	Edinburgh.
Strachan, Alexander.....		Aberdeen.
Thomson, James		Dunfermline.

MODIFIED EXAMINATION.

Seven candidates presented themselves; the following six passed, and were duly registered as

CHEMISTS AND DRUGGISTS.

Baine, John Alexander .....Greenock.
Barr, Thomas James .....Dunfermline.
Cameron, William Alexander .....Egremont, Cheshire.
Martin, James .....Glasgow.
Robson, John .....Liverpool.
Weir, William .....Glasgow.

ERRATUM.—Page 457, line 15, *for* Mr. Kains, *read* Dr. Rains.

PHARMACEUTICAL MEETING.

Wednesday Evening, February 3rd, 1869.

MR. T. H. HILLS, TREASURER, IN THE CHAIR.

The Minutes of the previous Meeting having been read, the following

DONATIONS TO THE LIBRARY AND MUSEUM

were announced, and the thanks of the Meeting given to the respective donors thereof:—

Proceedings of the Royal Institution: from the Institution,—Proceedings of the Philo-

sophical Society of Glasgow,—Transactions of the Botanical Society of Edinburgh,—Journal of the Linnean Society,—Journal of the Chemical Society,—Journal of the Society of Arts,—Journal of the Photographic Society: from the respective Societies,—Specimens of "Quill" and "Tablet" Barks from a new Species of Cinchona, discovered by and imported by Señor Pedro Rada, from Eastern Bolivia: presented by W. H. Peat, Esq.,—An Antique Pestle and Mortar, bearing the following inscription in raised capitals, SOLI DEO GLORIA, 1633: presented by Mr. Garle,—Six Specimens of American pressed Herbs: presented by Messrs. B. O. and G. C. Wilson, Botanical Druggists, Boston, U.S.,—Fresh Fruits of *Citrullus Colocynthis:* presented by Mr. Morson,—Specimens of Linseed and Cotton Cake, also specimens of Palm Oil and Cake: presented by the Curator,—Specimens of the Leaves and Bark of *Cascarilla Carua*, of Weddell: presented by Mr. Howard.

The following papers were read:—

NOTE ON CRYSTALLIZED CARBONATE OF MAGNESIUM.

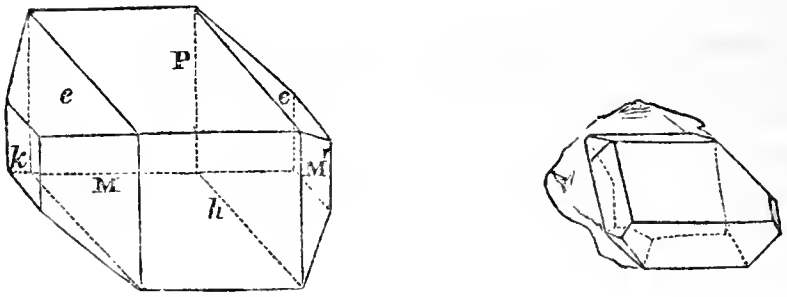
BY PROFESSOR ATTFIELD.

Ordinary *Magnesia alba* (*Magnesiæ Carbonas*, B. P.) is not a simple carbonate, but, as is well known, a compound which may be represented as containing three molecules of true carbonate of magnesium, one of hydrate, and four of water of crystallization ($3\,Mg\,C\,O_3$, $Mg\,2\,H\,O$, $4\,H_2O$). When this substance is suspended in water, and a current of carbonic acid gas transmitted, a solution known as "Fluid Magnesia" results (*Liquor Magnesiæ Carbonatis*, B. P.). On heating this solution, pure terhydrous carbonate of magnesium ($Mg\,C\,O_3$, $3\,H_2O$) is precipitated, and the same compound is deposited in well-marked acicular crystals by the spontaneous evaporation of the liquid. If, however, the solution be exposed to extreme cold for any length of time, transparent crystals of a different character are deposited; they have hitherto been described as tabular, and are composed of one molecule of true carbonate of magnesium with five instead of three molecules of water of crystallization (Fritzsche). On exposure to air and light they become opaque and lose two-fifths of their water, having then the chemical composition of the acicular crystals obtained by evaporation, but totally differing in appearance. Small crystals of this tabular variety of carbonate of magnesium were optically examined in 1823 by H. J. Brooke, Esq., F.R.S. ('Annals of Philosophy,' vol. vi. p. 375). He found their primary form to be an oblique rhombic prism, which might be cleaved in two directions (parallel to the planes M and M in the following figure).

This pentahydrous carbonate of magnesium is now noticed simply to draw attention to some unusually large crystals of the salt recently forwarded to me by Mr. Barnard S. Proctor, Pharmaceutical Chemist, Newcastle-on-Tyne. The largest is figured in the accompanying outline; it was 13 millimetres (about $\frac{1}{2}$ an inch) long, 9 wide (about $\frac{3}{8}$ths of an inch), and 6·5 thick (about $\frac{1}{4}$ inch). All had become opaque, and on analysis proved to have been converted by exposure into the terhydrous salt. ·3240 of a gramme, analysed by my pupil Mr. Alfred Franklin, yielded ·0945 of magnesia ($Mg\,O$). One hundred parts gave

By experiment	By calculation
29·167	28·988

Of the following figures, the first is a copy of that originally drawn by Brooke, to show the normal form of the crystal on an enlarged scale; the second represents the actual size of the largest of the crystals now noticed. By goniometric measurement I was able to make out every angle mentioned by Brooke, though at first sight, through unequal extension of some of the planes, my crystals differed materially from that he figured.



P on M or M′	102°·00′
P on *e*, or *e*′	120°·30′
M on M′	86°·30′
M on *h*	133°·15′
M on *k*	136°·45′

A NOTE ON ARSENICAL PLAYTHINGS.

BY PROFESSOR ATTFIELD.

One more word of caution, in addition to those already published, concerning arsenical pigments may prove useful.

I recently sat watching the pretty play of two children in whom I have special interest. The one, a boy, about two years old, was charmed with the movements of a toy bird suspended by an elastic thread; the other, a baby girl, equally delighted with a simple cotton reel. Each testified joy by suddenly stuffing the plaything into its mouth. But the wings of the bird were coloured green: so was the label on the reel. The articles were therefore quickly taken from the children, subsequently analysed, and found to contain arsenic. Now this statement need not alarm any one. Arsenical paperhangings, paints, artificial flowers and birdies, and even arsenical labels, are all useful and pretty in their way. These green pigments or powders (green dyes are harmless), like sharp knives, needles, and scissors, have their appointed place; but they must be kept out of the mouths of children.

NOTE ON THE SEPARATION OF TIN FROM ANTIMONY.

BY PROFESSOR ATTFIELD.

The analysis of a solution containing tin and antimony is usually effected by immersing pieces of iron; antimony is then precipitated, an equivalent quantity of iron going into solution; the tin salt remains in the liquid. Sufficient acid is added to dissolve the whole of the iron; the precipitated antimony is then collected on a filter, washed, dried, and weighed; the tin precipitated in the form of sulphide, washed, dried, converted into stannic oxide by ignition, and weighed.

This method, however, does not yield concordant results. Working on an alloy of known composition, perfectly correct percentages will sometimes be obtained, but frequently too little antimony comes out, and too much tin. The cause of this discrepancy was not, at first sight, apparent; but noticing that the best numbers were obtained when the operation was quickly performed, the thought occurred to me that possibly the oxidation of the ferrous product by the air gave a liquid which redissolved the precipitated antimony. The matter then resolved itself into this question: does metallic antimony reduce ferric

salts to ferrous, the antimony becoming dissolved by the influence of the excess of acidulous radical in ferric salts over and above that in ferrous salts? To answer the question, some solution of chloride of antimony was placed in a beaker, and a similar quantity in a flask, metallic iron and hydrochloric acid added to each, and both warmed. As soon as the iron had disappeared in both vessels, the flask was tightly corked, the beaker being set aside uncovered. In the course of 24 hours the quantity of antimony in the beaker had diminished, and in 48 hours had wholly redissolved. In the same time the antimony in the flask had not sensibly diminished; indeed on testing the liquid, no antimony was discoverable. Ordinary metallic antimony of commerce was next finely powdered and digested in solution of ferric chloride, the result being slow reduction to ferrous chloride, the liquid taking up antimony.

These experiments show that in precipitating antimony by iron with the view of quantitatively estimating the antimony, air must be excluded until all ferrous salt is washed away. This can generally be accomplished by using large beakers or precipitating-glasses, a considerable quantity of well-boiled and still boiling water, and washing rapidly by decantation. In delicate experiments, mechanical arrangements might be contrived, whereby the antimony could be washed in an atmosphere of carbonic acid gas.

NOTE ON A CRYSTALLINE DEPOSIT IN AN OPIUM LINIMENT.

BY PROFESSOR ATTFIELD.

Mr. Young, Pharmaceutical Chemist, recently brought under my notice the fact that on mixing one pint each of tincture of opium, soap liniment, and compound camphor liniment, about a quarter of an ounce of a greenish-yellow semi-crystalline precipitate rapidly formed, sometimes adhering in tufts to the sides of the bottle. He was anxious to know whether or not the deposit consisted of any of the active principles of the opium, and if so, how its occurrence might be prevented. Other pharmacists, doubtless, have met with the deposit, and will therefore be glad to know that it consists solely of the acid meconates of potassium and (mainly) sodium, with a little sulphate of calcium. My pupil Mr. Franklin found that 100 parts yielded 17 of water, 47 of organic matter, 3 of inorganic ash insoluble in water, and 33 of inorganic alkaline ash soluble in water. Its presence or absence in a liniment is apparently of no moment.

In answer to questions put by the CHAIRMAN and others, Dr. ATTFIELD stated that the precipitate was formed in a few hours after mixing the ingredients, and that it was entirely free from morphia.

NOTE ON SULPHATE OF POTASSIUM IN ERGOT.

BY PROFESSOR ATTFIELD.

In the official process for *Extractum Ergotæ Liquidum*, B. P., powdered ergot, freed from oil by ether, is exhausted by warm water, the mixture filtered, the filtrate evaporated to a low bulk, spirit of wine added, the mixture set aside for coagula to subside, and, after an hour, filtered and bottled for use. On recently carrying out this process, a correspondent (Mr. Romans, 55, Westgate, Wakefield) tells me that after adding the spirit of wine he had occasion to set the mixture aside during a night instead of for one hour, and on the following morning found the walls of the bottle lined with crystals. These he collected, purified, and

forwarded to me, with the request that I would ascertain their nature, and thus be enabled to say whether or not their separation involved deterioration of the extract. They were found to be the inert salt sulphate of potassium.

This note is published for two reasons: first, to assure any pharmacist who may have met with these crystals that their presence or absence in ergot or its preparations is of no therapeutic importance; second, to draw attention to a possible, perhaps a general constituent not previously noticed by chemists who have analysed ergot. Mr. Romans tells me the crystals amounted in weight to about 3 per cent. of the ergot employed.

Mr. Rose said it was of great practical importance to have papers of this kind occasionally, because in making preparations they often got precipitates without knowing what they were, and they had not the time to examine them. They were very much indebted to Dr. Attfield for bringing these matters before them.

The Chairman also bore testimony to their importance, and invited other gentlemen to bring forward what they observed in the course of their business, because these were important points to refer to in case of a new Pharmacopœia being prepared.

Dr. Attfield need scarcely say that if gentlemen met with anything crystalline which they could not account for, and had not time to examine, if they would send it to him they would be doing him a favour, and possibly conferring considerable benefit on pharmacy, and perhaps on science in general. Many important discoveries had risen from very small things. He might just allude to a note which he had received from Mr. Holloway, of Sydenham, a most observant follower of pharmacy, who was always on the look-out for such little matters as those which had that evening engaged their attention. Mr. Holloway, in the course of work, had noticed that cantharides in powder was well preserved by the addition to it of a small portion of spirits of wine; and so it occurred to him that powdered herbs might be preserved in the same way. He mixed with powdered herbs 20 per cent. of spirit, and thus preserved them for any length of time. The specimen was prepared on October 11th, 1866, so that it was more than two years old. He (Dr. Attfield) thought such a process would prevent the attack of insects. The specimen before them was in nice condition. It had, he understood, been kept in a bottle, so that the spirit would not have evaporated. They might think that the spirit of wine being in a fine state of division would be more liable to oxidation, and that they would get a contaminated product. Mr. Holloway alluded to the acid reaction of the powder, but referred that to natural acidity. Those gentlemen who might wish to preserve such powders, might be glad to know of this method.

The Chairman said the plan he had seen adopted was to powder only a small quantity at a time, and not to keep a large stock of it. It had been noticed that if it was kept in stoppered bottles it very soon spoilt. He had observed that when a kind of nick had been filed in the stopper, the powder kept very much better than when it was perfectly stoppered. Probably it would keep better in a corked bottle than in one with a stopper. The great secret, however, was not to powder too much at a time, so that it should always be fresh.

Mr. Umney said powders kept perfectly in an open tin.

Mr. Francis had observed that they kept best in vessels not tightly closed.

Mr. Howard thought that if these things had free access of air they would keep almost any length of time. Almonds were very difficult things to keep from the attacks of insects, but by keeping them turned over they could keep them for eight or nine months.

Mr. Hanbury remarked that there was great difficulty in preserving seeds, fruits, and things of that kind, in museums; and almost every museum required

to have specimens of that class renewed from time to time. The specimens got completely destroyed, not by very minute insects, but by a species of little beetle; and he did not know that any method such as had been suggested would prevent the attacks of these little creatures. He was not aware whether their museum was infested with them; but at the College of Physicians, where there was an extremely old collection of the materia medica, almost all the specimens of a certain class were practically worthless, owing to the depredations of these little beetles. At the museum in Kew also, much injury was done by these beetles.

In some further remarks that were made, carbolic acid and also camphor were recommended, where their smell would not interfere with their use.

NOTES ON WHITE PRECIPITATE.

BY PROFESSOR ATTFIELD.

At the Dundee meeting of the British Pharmaceutical Conference (Sept. 1867), Mr. J. B. Barnes gave the results of an examination of sixty-one samples of "white precipitate," fifty-seven of which were found to be quite free from non-volatile adulterants, such as dry white-lead and chalk. Three months afterwards, Mr. Borland, of Kilmarnock, in a communication to the Pharmaceutical Society, stated that of twenty-four samples of "white precipitate" he had examined, not one contained any non-volatile matter, yet only five could be said to be the pure infusible official preparation, containing 79½ per cent. of mercury, the remaining nineteen being the "fusible white precipitate" of old Pharmacopœias, and containing only 65½ parts of mercury in 100. The object of the present note is to show that, while the property of complete volatility in "white precipitate" does not necessarily imply perfect purity, the character of fusibility does not necessarily indicate that the specimen only contains 65½ per cent. of mercury, or the quality of infusibility prove that it contains the official proportion of 79½ per cent.

Six specimens of "white precipitate" were examined in reference to (*a*) volatility, (*b*) fusibility, and (*c*) percentage of mercury. Each specimen, when placed in a test-tube and heated, volatilized without leaving a trace of residue. During sublimation, four gave no signs of fusion, one partially melted, and one liquefied entirely. The percentage of mercury in the samples is given in the following table:—

Commercial "White Precipitate."

Number.			Mercury in 100 parts.
1	volatile	infusible	78·59
2	volatile	infusible	77·87
3	volatile	infusible	76·44
4	volatile	infusible	75·11
5	volatile	partially fusible	73·08
6	volatile	fusible	72·00
NH_2HgCl, B. P. 1867		infusible	79·52
$NH_2HgCl, HgCl_2$		partially fusible	76·55
NH_2HgCl, NH_4Cl, L. P. 1824		fusible	65·57

An inspection of this table will show that neither specimen contains any non-volatile adulterant, properly so-called,—no plaster of Paris, chalk or dry white-lead is present. Secondly, the fact that the first four are infusible, and the other two fusible would, up to the present time, have been considered to indicate that the former had been made by the modern process of pouring solution of corrosive sublimate into solution of ammonia, and contained the normal propor-

tion of 79½ per cent. of mercury, while the latter had been prepared by the old process of admixture of solutions of pearlash, sal ammoniac, and corrosive sublimate, and contained but 65½ per cent. of mercury. Not one of the six samples, however, when quantitatively analysed for metal, gave so much as 79½ or so little as 65½ parts of mercury in one hundred; the richest yielded 78½ per cent. of mercury, the poorest 72 per cent., the intermediate numbers being, roundly, 78, 76½, 75, and 73. At first I thought that the weaker samples had, perhaps, been made by pouring solution of ammonia into solution of corrosive sublimate, instead of *vice versâ*, as ordered in the British Pharmacopœia, the double chloride of mercuric-ammonium and mercury ($NH_2HgCl, HgCl_2$) being produced, which contains only 76½ per cent. of mercury. But on attempting to prepare this compound, I found that it began to turn yellow long before all the chloride of ammonium (the by-product) had been washed away, and, therefore, before the percentage of mercury in the precipitate had reached 70, or, perhaps, 65. Now not a trace of yellowness was visible in either of the six samples examined. The only other explanation of the facts of the case that presented itself was that the samples had all been rightly made by pouring solution of corrosive sublimate into solution of ammonia, but that the resulting precipitate had been insufficiently washed. This proved correct. The poorer samples, on washing, readily furnished chloride of ammonium without losing colour, and certain artificial mixtures of true "white precipitate" (chloride of mercuric-ammonium, NH_2HgCl) and chloride of ammonium, containing respectively 73 and 72 per cent. of mercury, comported themselves in a heated test-tube in much the same manner as samples 5 and 6 in the table. Commercial white precipitate is, then, as a rule, properly prepared, and not intentionally adulterated, but is usually somewhat impure, through the presence of more or less chloride of ammonium.

With regard to the degree of purity or percentage of mercury which "white precipitate" (*Hydrargyrum Ammoniatum*, B. P.) may reasonably be expected to possess, I think, with Mr. Borland, that the character of volatility without fusion should be insisted on, and that a sentence to that effect should be inserted in the paragraphs relating to this chemical in the next edition of the British Pharmacopœia. Further, I am of opinion that while on the one hand this preparation cannot be expected to yield the theoretical proportion of metal, inasmuch as before the last trace of chloride of ammonium is washed away, the precipitate acquires an undesirable yellow shade of colour, through slight decomposition,—that, on the other hand, to keep out unofficial varieties of white precipitate, and to exclude undue proportions of chloride of ammonium, ammoniated mercury should be described in future Pharmacopœias as containing not less than, say, 78 per cent. of mercury.

SULPHUROUS ACID.

BY C. UMNEY, F.C.S.

The introduction into the British Pharmacopœia of remedial agents of whose therapeutic value comparatively little was previously known, has been the means of giving to medical practitioners new material for research; and has undoubtedly resulted in promoting investigations which otherwise would never have been attempted.

The action of sulphurous acid, a remedy of antiquity now placed in the Pharmacopœia, had been much less studied than it apparently deserved, for recently most beneficial results have followed its use in affections of the throat, by means of the spray producer, as recommended by Dr. Dewar,* whose experiments with

* Dr. Dewar's Pamphlet on Sulphurous Acid.

this body in various forms of disease seem to have been most successful; also used to some extent by Mr. Hamilton, Surgeon to the Liverpool Infirmary, in cases of typhoid or enteric fever;* the results of whose experiments have been confirmed by Dr. Jones, of Liverpool.† The latter gentlemen both used a solution *professedly* of the Brit. Pharm. strength; Dr. Dewar, a more dilute solution, not exceeding 4 per cent. of real sulphurous acid.

For some time past I have observed that the solution of sulphurous acid, as supplied by manufacturers, variously labelled "Sulphurous Acid, Saturated Solution of Sulphurous Acid, Sulphurous Acid, B. P." has very much differed from the acid as described by the Pharmacopœia, which is defined as having a spec. grav. of 1·040, and containing 9·2 per cent. of real sulphurous acid.

The commercial solutions I examined varied in strength from 2 to 6 per cent.; none approached the high standard of the Pharmacopœia.

It was quite obvious that this deficiency did not arise from any attempt to make a preparation of inferior quality with such a body as sulphurous acid,—used as it is daily in the arts in enormous quantity as a cheap bleaching agent, and moreover as in many laboratories it is merely a by-product,—but rather from some practical difficulties in making such a strong solution on the large scale.

The following experiments were made with a view to determine the strength of the acid that could be obtained by the officinal process, and to ascertain the circumstances most favourable to its production:—

1. Oil of vitriol was reduced in a flask by charcoal, the resulting gas after passing through the wash-bottle was allowed to slowly bubble through the water intended for its solution, this being kept at the temperature of the laboratory (65° to 70° F.); after 8 hours, nearly 2 per cent. was found to have been dissolved, the solution having a spec. grav. of 1·009 at 60° F.

2. The current of gas produced, as in previous experiment, allowed to pass slowly through water for 36 hours. Solution nearly 6 per cent., spec. grav. 1·030.

3. Gas passed through water slowly under a pressure of 1 lb. (2 inches mercury) for 8 hours, under same conditions as before. Solution 5 per cent., spec. grav. 1·028.

4. Solution made under 2 lbs. pressure (4 inches mercury) for 8 hours, indicated $5\frac{1}{2}$ per cent. Spec. grav. 1·030. (This clearly showed the advantage of using pressure, the solution of the gas being more readily effected.)

5. Iced water was then kept around the receiver; the gas was slowly passed through for 16 hours, resulting in a solution of nearly 9 per cent., and 1·045 spec. grav.

6. Increased pressure repeatedly tried, the result being invariably the fracture of the generator.

Not having other available apparatus at hand, and as I had obtained much beyond the spec. grav. of the Pharmacopœia solution, and had almost approached its strength,—from want of leisure I did not continue my research.

The various solutions carefully examined‡ with a volumetric solution of iodine of the strength indicated by the Pharmacopœia, $\frac{1}{10}$ of an atom (12·7 grains) in 1000 grain-measures (the accuracy of the iodine solution being confirmed by the volumetric solution of hyposulphite of soda), gave results which, combined with

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* 'Lancet,' vol. i. 1869, p. 45.

† *Ibid.* p. 126.

‡ In weighing the acid for examination, I always counterpoised in the beaker in which the acid was to be weighed about one ounce of cold water, as I found this prevented the loss of gas of the strong solutions which invariably resulted if weighed alone, the acid being taken out with a pipette, the analysis of each specimen was thus effected rapidly—certainly in 3 or 4 minutes.

the various specific gravities of the solutions described, could only point to one conclusion, viz. that the Pharmacopœia solution did not coincide in its described spec. grav. as compared with its percentage of acid; for a solution of 1·040 indicated but 7·8 per cent. of real acid instead of 9·2 per cent., or in other words, if the spec. grav. was correct, the *strength* was an error, or *vice versâ*.

The Brit. Pharm. 1864 directed an acid of 1·040 spec. grav., but only indicated the numbers of measures of iodine solution required for its saturation as equivalent to 8·3 per cent.

This, therefore, is an approximation to the result I have obtained.

In an excellent review of the officinal acids by Mr. C. H. Wood, article "Sulphurous Acid,"* it is said, "This acid is of the same strength, and is prepared in the same manner as before."

It is certainly of the same specific gravity, viz. 1·040, but I find by calculation that 88 measures of iodine solution less in 1000 measures are indicated than by the B. P. 1867, an equivalent of nearly 1 per cent. real acid. The two solutions of the two pharmacopœias, although of the same specific gravity, cannot, then, be of the same strength.

The manufacture of the acid on the large scale, up to even the highest point to which I have arrived, is next to impossible. I will quote the remarks of a chemist, in a letter upon this subject to me, who is in the habit of making tons yearly. He says, "I obtain a solution of 1,030 easily (comparatively); and in cold weather and a slow current of gas, ordinarily I get acid from 1·025–30."

Through the kindness of Messrs. May and Baker, Battersea, I have been favoured by their chemist, Mr. Tyrer, with the result of two experiments made on a very large scale, and under the most favourable circumstances.

A charge of 200 lbs. charcoal and 140 lbs. oil of vitriol was placed in a still of 120 gallons' capacity; the gas washed and passed through a series of Woulfe's bottles, the exit pipe from the last bottle being weighted at 6 lbs. pressure. In temperate weather by this method an acid from 1·033 to 1·035 can be produced, and by passing through a second charge of gas from a fresh supply of oil of vitriol, a solution of 1·036 to 1·038 can be produced,—but this only on cold nights and working very slowly; if the gas is passed rapidly, more is lost than gained.

The second experiment was but a modification of this, substituting at the last of the Woulfe's bottles a pressure produced by a column of water of 12 feet (6 lbs. pressure), with plugs inserted at 3 feet intervals, so that by withdrawing them the pressure could be regulated. This means of producing pressure was adopted in preference to the valve, which invariably corroded, as it gave a ready means of allowing the carbonic acid and carbonic oxide to escape. The result, however, was an acid of only 1·038 specific gravity, as in previous experiment. To work regularly at this amount of pressure would be anything but desirable.

The U. S. Pharm. orders a solution of 1·035 specific gravity; no strength is however named, neither is a process given for its estimation; it does, however, direct the solution to be put into half-pint bottles, well stopped, and kept in a cool place. In the 1837 edition of the French Codex, a solution of thirty-seven volumes is directed, the specific gravity described as 1·053. The gas, however, is made by the reduction of oil of vitriol with mercury, which gives a product nearly pure. This is almost identical with my result, taking into consideration the quantity of carbonic acid necessarily dissolved with the sulphurous acid under pressure.

It cannot for one moment be doubted that a solution of much greater strength than any here indicated could, in the experimenting room, under certain cir-

* Pharm. Journ. Vol. IX. page 64.

cumstances, be made without great difficulty (using copper and sulphuric acid to obtain the sulphurous acid); for we have the unquestionable authority of Bunsen upon the subject, who is thus cited by Miller, in his 'Elements of Chemistry:'—"Water will absorb at 32° F., 68·8 volumes; at 59°, 43·5 volumes; and at 75°, 32 volumes."

Now the Pharmacopœia solution (which is about 37 volumes) was designedly made nearly one of saturation at the average summer temperature of this country, and, if one may be excused for making a guess, was described from calculations made from the above data of Bunsen's, and not practically worked out to see whether such a solution could be ordinarily obtained in the manufacturing laboratory without chance of failure, and, when made, be kept without great alteration in the various stages it would have to pass through, even if only from the manufacturer to the wholesale druggist, then to the pharmacist, in whose store it might remain for a year or more, being perhaps placed in a temperature many degrees above the point at which it was saturated, thereby causing expansion, liberation of gas, and inconvenience.

It may be here worthy of note, that a solution of sulphurous acid of any great strength decomposes into sulphuric acid in partially filled bottles four times as rapidly in a light green bottle as when kept in one of dark blue,—the maximum rate being in six months equivalent to 1·436 per cent. sulphuric acid. The following table will give, I think, sufficiently accurate for medicinal purposes, the specific gravity of solutions* from 1 to 8 per cent., made by the officinal process:—

Per cent. of SO_2.	Specific gravity.	Volumetr. Sol. of Iodine, B.P.
1	1·005	108·6
2	1·011	217·3
3	1·017	326
4	1·022	434·6
5	1·027	543·3
6	1·032	652
7	1·037	760·8
8	1·042	869·5

The stronger solutions are most powerful, causing not a little inconvenience in transfer from one bottle to another, from the quantity of irrespirable gas given off; and it is to be doubted, had an acid been used of Brit. Pharm. strength, or even one approaching it, in the experiments of Mr. Hamilton and Dr. Jones, as described in the 'Lancet,' whether one-drachm doses to children and three-drachm doses to adults, every four hours, could have been given without ill effects. It is more probable that a solution, as ordinarily found in pharmacy, of about 2 or 3 per cent. was used.

I should suggest that a solution of 1·027 specific gravity, containing 5 per cent. by weight of real acid, be substituted for the present officinal solution at the earliest opportunity, such a solution being sufficiently strong for medicinal purposes. There would then be no difficulties attendant upon the production of acid of such strength, neither would there be the least justification for the entire absence of such a solution from pharmacy.

We should thus be giving the remedy a fair trial, and by its medicinal merits alone it would either retain its place or be expunged from future Pharmacopœias. This communication, I trust, will prevent any blame from being attached to the pharmacist, if such a valuable remedy should undeservedly be brought into disrepute.

Laboratory, 40, *Aldersgate Street, E.C.*

* Made by dilution of the stronger solutions with water.

In reply to a question from the CHAIRMAN, Mr. UMNEY said, he thought an acid containing 5 per cent. would be strong enough for use in medicine.

Dr. ATTFIELD thought that if an acid of the strength indicated in the Pharmacopœia was really required, it would be necessary to obtain it by passing the pure gas into water, and not the two gases resulting from the action of charcoal on sulphuric acid.

NOTE ON MUSTARD OIL-CAKE.

Professor ATTFIELD said he had no other note written, but there was one subject to which he could allude to occupy the remaining few minutes of their time, and especially as he saw on the table some specimens of oil-cake. He did not know under what circumstances and conditions these specimens had been placed upon the table; apparently they were good samples of linseed-oil and cotton-seed cake. A short time ago he was asked by a pharmaceutist to analyse two samples of oil-cake. It appeared that a farmer in the country had been supplied by contract with a large quantity of seed-cake, and had purchased it as genuine linseed-cake; but he was dissatisfied with its appearance, and also with its results on his cattle, and he accordingly had it examined. Now, a mere glance at it showed him (Dr. Attfield) that the cake the farmer had been using was not all, nor even a large portion of it, linseed-cake, but consisted of what evidently was rape-cake and mustard-cake. In September last he had the opportunity of going over Colman's mustard-mills at Norwich, and he was presented by Mr. Colman with a sample of the cake produced by pressing the husks of the seeds with great force whilst they were hot. The oil from the seed ran away, was collected and sold, and the residue was mustard-cake. The appearance of this was different from that of linseed-cake, and any one accustomed to these articles would recognize it at once. He asked Mr. Colman whether the mustard-cake was sold for cattle-food; he replied that it was not, and that persons who knew anything about it would not buy it, as it produced irritating effects on the animals; that therefore they were obliged to sell it for manure. The price of the genuine linseed-cake was about £12. 10*s.* or £13 per ton; of rape-cake about £6. 10*s.* or £7 per ton; and of the mustard-cake about £4. 10*s.* or £5 per ton,—so that there was a strong inducement for adulterating the superior article. He drew attention to this subject in order that that point might be noticed, and also to give an analysis of mustard-cake. So far as he knew, no analyses of it had been published, although several had been published regarding rape- and cotton-seed. Mustard-cake did not differ very much, so far as an ordinary analysis indicated, from the other cakes. It contained 11 per cent. of water,—that was not an unusual quantity; in fact, when recently taken from the mill, all cakes contained 13 or 14 per cent. of water. There was 8 per cent. of ash, which was not very high,—linseed-cakes often contained about 5 per cent.; then there was $12\frac{1}{4}$ per cent. of fibrous matter, and that, too, was about the percentage ordinarily found in linseed-cake. There was next 14 per cent. of oil: samples of rape-cake frequently contained 8 or 9 per cent. of oil; and the quantity found in linseed-cake was higher than that. Oil was an important constituent of cake, and there should be 11 or 12, or even more, per cent. in linseed-cake. Then there was the albuminoid matter, the vegetable albumen, which was found by estimating the nitrogen, and multiplying that by the number which should express albumen. There was $16\frac{1}{2}$ per cent. of nitrogen in albumen, so that they could easily estimate the amount of flesh-forming matter—in contradistinction to that which contributed to animal heat. The albuminoid matter present was 31·7 per cent., which was

a common number for linseed-cake. Then there was 27½ per cent. of mucilaginous matter. So that there was really nothing that chemical analysis would indicate as showing the valueless character of the cake itself.

PHARMACEUTICAL SOCIETY, EDINBURGH.

A meeting was held in St. George's Hall, on Wednesday evening, 27th January, at nine o'clock; Mr. AITKEN, Vice-President, in the chair.

Professor Archer read the following paper:—"On the General Features of the Materia Medica Collection in the Edinburgh Museum of Science and Art."

In forming a collection of the industrial materials yielded by the mineral, vegetable, and animal kingdoms, to illustrate the industrial pursuits of man, I felt that it would be a serious omission to leave out those which are used in medicine, although, generally speaking, they do not form attractive objects in museums. Moreover I perceived, that although the medical corporations of this city possess very fine special collections, they did not embrace much beyond the materials employed in British Pharmacy, and were not sufficiently free to all students, especially to the pharmaceutist; I therefore aimed in the first place to collect such specimens as were unknown in British Pharmacy, or were so rare as to be objects of especial interest. How far this has been done, I hope to show in this paper.

The first contribution of importance which was added to the collection was a large series of medicinal substances, illustrating very fully the 'Materia Indica of Ainslie,' one of the most interesting and instructive books ever published upon this subject. For this valuable gift the museum is indebted to Professor Christison. In 1862 great accessions were made from the Exhibition held that year in London, amongst which the most notable was a series of the most important of the medicinal products of Brazil, chiefly collected and prepared by Senhor Theodor Peckholt, M.D., who, as a scientific pharmaceutist, deserves to be warmly recognized by the European Societies. The collection consists of—1st, fruits, seeds, barks, roots, and fungi; 2nd, starches, many of which were from sources quite new to us, such as *Sisyrinchium galaxoides*, *Helmia bulbifera*, *Mirabilis dichotoma*, *Ipomœa operculata*, *Cocculus cinerascens*, besides the various species of yam (*Dioscorea*), arums, colocasia, sweet-potato (*Batatas edulis*), etc.; 3rd, vegetable juices, extracts, gums, resins, etc. Amongst these are a dragon's-blood from *Croton erythrema*, another red gum from *Andira angica*, and several others not previously known in Europe. 4th, a series of expressed oils, most of them new to European collections. It is perhaps allowable to mention here that Dr. Peckholt also exhibited upon that occasion a very large series of admirably-prepared chemicals, especially the active organic principles of a number of Brazilian plants, which will probably some day or other be of considerable importance to European pharmacy. I regret to say that I did not obtain any of these. Some of the more remarkable amongst them were Agoniadina, from the bark of *Plumeria lancifolia*, Mart.; Pereirina, from *Geissospermum Vellosii*; Poncetina, from *Euphorbia pulcherrima*, etc.

Many other Brazilian medicines were obtained at the same time, both vegetable and animal; of the latter I hope to give an account to the Society on some future occasion in a paper on the animal products in the collection.

On the same occasion I obtained from the Commissioner for Venezuela specimens of the berry yielding the myrtle-wax of that country, also very fine cebadilla seed and simaruba bark. Many rare and interesting substances were also obtained from the collections sent by other countries, and especially by the British Colonies, more especially Hongkong, from which was sent a complete collection of the materia medica of China. This was much lessened by busy fingers during the Exhibition, but such as it was at the close, it came into my hands, and is now in our museum.

One of the most remarkable instances of enlightened enterprise was shown by the French Government, who ordered in all the colonies of the empire that every natural product, animal, vegetable, or mineral, having any known use, should be collected, and the wonderful collection so formed was shown in the Exhibition of 1862. I am happy to say that collection, presented by the Department of Science and Art, is now in our museum, and amongst some thousands of specimens comprising textiles, dyes, tanning substances, oils and oil-seeds, gums, food materials, etc., of which it is chiefly composed;

it also contains the medicinal substances of Martinique (about 120), of Guadaloupe (25), of Guyana (30), West African Colonies (10), of Réunion (50), of French India (120), and of Cochin China, Tahiti, etc. (about 20).

During the interval that has elapsed since 1862, small additions have constantly been going on, until 1867, when an entire collection of the native drugs of the Cape of Good Hope, chiefly collected by the late eminent Cape botanist, Dr. Pappe, was given to us by the Commissioner (Mr. Currey), who represented that Colony in the Paris Exhibition. Since then the pharmaceutical world has lost an eminent man, Mr. Warington, who so many years held the direction of the drug department of Apothecaries' Hall in London; before his death, he expressed a wish to his sons that his collection, a very valuable one, should be placed in the Edinburgh Museum of Science and Art. This was done at the end of last year, and it will in a very short time be available for students.

Although I have mentioned chiefly the medicines of other countries than our own, some progress has been made in collecting those with which we are more immediately connected. Besides Mr. Warington's collection, we have a beautiful series illustrating the preparation of opium in the Indian factories, for which we are indebted to Dr. Christison, son of Professor Christison, who took great interest in getting it complete for us; placed beside, and in continuation of this, is a beautiful series of the salts and acids of opium, and when I mention that they were prepared by Messrs. T. and H. Smith, of Duke Street, to whose liberality we are indebted for them, any praise of them would be superfluous. I think I have now shown that the materia medica branch of the museum has not been neglected, and that it cannot fail of being of great importance to those who are anxious to make themselves masters of the subject, and obtain that eminence of which there have been so many bright examples. At present this department is far from being completely arranged, but no student who applies to inspect a specimen is ever refused; indeed, we feel it a pleasure to afford every possible facility to all who are in the pursuit of knowledge.

At the close of his remarks, Professor Archer read the following letter from the Messrs. Wilson, wholesale botanical druggists in Boston, who had, at the request of Dr. Edwards, F.C.S., sent over a few specimens of dried herbs and flowers. Half-a-dozen specimens which had arrived from America that day were submitted to the meeting. They were apparently preserved in flat tin cases, and had the top made of glass:—

"B. O. and G. Wilson, Wholesale Botanic Druggists, 18 and 20, Central Street, Boston, Jan. 9, 1869.

"Professor Archer, Industrial Museum, Edinburgh, Scotland.

"Dear Sir,—For the past twenty-five years we have been engaged in the selection and preparation of American herbs, roots, barks, flowers, and seeds. Our attention has been particularly directed to the selection of the herbs and flowers, and we have obtained a reputation for the preparation of a class of goods of superior quality to those of any other house of America. We cull all the stalks, separating them from the leaves, and rejecting them, pressing only the bright fresh leaves, these being the portion which contains all the desirable qualities of the herbs; of course this method of preparation enhances the cost, but it is found by a majority of our best pharmaceutists that they are intrinsically cheaper, as well as superior in quality.

"We enclose a statement of the American Pharmaceutical Association, in regard to our preparations, to which we would call your attention.

"It has been suggested by Dr. J. Baker Edwards, F.C.S., Montreal, that we send you a few samples of the goods spoken of, and desire you to place them among your specimens, and he gave the writer the enclosed note, and will write you in regard to the matter. In accordance with his suggestion, we have sent to our agents in Liverpool a small parcel with directions to forward to your address. We trust you will make such disposal of them as shall bring them to the notice of the pharmaceutists in your locality. We shall be happy to hear of their receipt by you, and trust they will be of mutual benefit to the pharmaceutists and ourselves. We are, Sir, yours respectfully, B. O. and G. C. Wilson.—W. F. Horton."

Specimens shown at the meeting by Professor Archer:—*Eupatorium perfoliatum* (boneset), *Gnaphalium polycephalum* (life-everlasting), *Marrubium vulgare* (horehound), *Artemisia Absinthium* (wormwood), *Hyssopus officinalis* (hyssop), *Salvia officinalis* (sage leaf).

A special vote of thanks proposed by the Chairman to Professor Archer, was very warmly responded to by the meeting.

The following communication was then read by Mr. W. Leitch, on "Our Profession, Past, Present, and Future":—

Mr. President and Gentlemen,—I appear before you this evening with a considerable amount of diffidence, remembering how recently I met with you under very different circumstances; but, as on that occasion you were pleased to find me honourably qualified to practise pharmacy, I have acceded to the request of your worthy Secretary to attempt authorship. I should feel much gratified if I came through this ordeal *without the "honours,"* but as my literary apprenticeship has yet to be served, I claim your indulgence for my shortcoming, with the hope that, if you send me back this time, I may come forward again better prepared. You will observe that the title of the subject I have chosen is a very comprehensive one, but it would be impossible for me, in the limits of a short paper, to do more than glance at the state of the trade under the three divisions indicated; I have therefore, as a first effort, only attempted a rather superficial and imperfect essay, deferring to a future opportunity, or abler hands, the devotion of a more finished paper to each of the divisions.

Past.—In therefore tracing the history of our trade (or, as I think we are now justly entitled to call it, our *profession*) under these conditions, it is scarcely necessary for me to go further back than the middle of last century,—for previous to that time there were but few who devoted themselves exclusively to the dispensing and retailing of medicines,—in those days our forefathers were so simple in their modes and habits of living, that they were subject to fewer and less complicated diseases; indeed there were few ailments which did not yield to one of the three grand curative powers, nature, blood-letting, or mountain-dew (and to show how fondly we sometimes cling to ancient customs, there are still a considerable number to be found who put unlimited faith in the curative and ameliorating properties of the latter). When these remedies failed, all the patient had to do was set his house in order and—depart.

The few simpler remedies then in vogue were to be obtained from the "merchant," a term of very vague import. In the present age a merchant is one who only deals by wholesale, and does not break packages, but in those days the title was assumed by almost every person who kept open shop, and the catalogue of their wares was of a most catholic and miscellaneous description. I have seen a few relics of this class of traders in remote villages, where you may still obtain clothing, groceries, ironmongery, physic, and stationery. Happily, however, at the present time, these combinations of attraction, or as some might call it, repulsion, are getting more rare; for step by step, with the rapid advance of civilization, increased refinements, and artificialities in the mode of living, and the vast numbers employed in sedentary and in-door occupations, there has come a train of new diseases, ever-increasing in complications or modifications, to meet which there has been, to say the least, an adequate advance in the science of physic and pharmacy. It has often been a question whether or not many of our present diseases existed or were known in former times, and were classed under some other more general denomination, or whether they have more recently originated, been discovered, or invented. I am inclined to think these diseases did exist, and that we are indebted to the greatly increased skill and information of the medical profession, who by their indefatigable labours have amplified the means of diagnosis, amended the classification of diseases, and extended the list of their complications. The result of this has been to extend to an equal degree the demands on pharmacy to supply suitable remedies and men capable of preparing them. And now the occupation of the astrologer, the alchemist, the general merchant, *et hoc genus omne*, are almost gone.

In the latter part of last and beginning of the present century, pharmacy began gradually to rise out of the chaos and assume a definite position and form, headed by men whose intellect and moral rectitude were sufficient to have earned distinction and success in any walk of life—men whose names can never be forgotten whilst pharmacy remains. Without being invidious, I may mention three familiar names of our own day, Bell, Duncan, and Macfarlan. It must be unnecessary in the present company to state how much we are all indebted to them for the large share they have had in their day in raising the status and social standing of the profession, and giving by their own success a stimulus to its more pure and exclusive pursuit. I do not for a moment under-

value the various adjuncts to the trade which, in smaller towns especially, have hitherto been necessary to the eking out of a decent income, as no man can be better aware from actual observation of the small sphere there is in country towns for those who desire to stick exclusively to their legitimate trade. These men have all along been hampered by petty dealers, and others having no special education, and whose only qualifications for the practice of pharmacy were the ability to furnish a shop, put coloured carboys in the windows, and stick up "Chemist and Druggist."

We can well imagine, if we have not experienced, how galling it must have been to many a man who spent his youth as an apprentice, and the best years of his manhood as an assistant, with a microscopic salary, scraping and saving until he could open for himself, to find a large part of his legitimate trade diverting into some of these channels, and absorbed by the parasites who are always ready to affix themselves to any trade where they see the legitimate dealer successful. People say that these things will right themselves in time, and that the public will soon come to find out the best shop; but many a good man has gone to the wall whilst they were making the discovery, and we all know how fond a considerable number of the said public are of a cheap bargain, *even in physic.*

Present.—I must now, however, congratulate the profession on the dawn of a new era, and that brings us to the present state of the profession.

I think I am near the mark when I say that we are now in the process of transition, and that sooner or later, be it in our day or in the next generation, last year's legislation will bring forth its fruit, in a profusion which would gladden the hearts of those who have laboured for its promotion; but not to be too sanguine as to the results, none can deny that it is a great stride in the right direction.

I know I begin to tread on delicate ground when within these walls, sacred as the scene where lately so many have well earned their various titles, and proved their qualification to take their places amongst the most honoured dispensers of our day. I feel the delicacy the more when I am addressing men so much older, more experienced, and better able to judge than myself; but in the interests of a very great number of my brethren, I must distinctly state my conviction that the recent Act of Parliament is not only insufficient for some of the purposes it was designed to serve, in that it does not go far enough for the suppression of illegitimate traders, whilst it imposes many vexatious restrictions on the trade proper,—but it commits what is felt to be great injustice on qualified individuals who had no voice in its production, and no appeal against its enactments.

In the first place then, I think that some means might have been devised whereby the poor and ill-advised public might have been protected from the wiles of those scourges, the so-called "Professors of Medical Botany," "Herbalists," "Botanical Institutes," and "Secret Advisers."

These trades are of small reckoning here, but I have frequently been a witness in other large towns of their roaring trade and pernicious effects.

You need only to look at the physique of the customers to see at a glance their gullibility, and the hold the professors have over their persons and purses; and this goes on until their constitutions are ruined or their resources exhausted, or both. In the second place, I think injustice has been done, or at least hardships inflicted on a very large section of our body, viz. Assistants and Apprentices. For whilst free registration was accorded to men in business on their own account, Assistants and Apprentices can only register their qualifications, or can at least not hereafter commence business without the payment of fees, which in many cases they can ill afford, and which, to say the least, seem to be a penalty exigible from them for being connected with the profession. Why should John Jones who opened a shop for dispensing the week before the passing of the Act, after having spent a year or two in a back slum compounding for a second-rate surgeon—why should he be registered as a chemist and druggist free of expense, whilst I, who served a full apprenticeship, and have been connected with pharmacy for fifteen years, have to pay five guineas, and run the risk of being plucked into the bargain, for the like title? I humbly think the more correct procedure would have been as in the case of the late Medical Act, by which every doctor or surgeon in practice was compelled to prove his title and pay, I believe, a guinea for registration. Had such been done in the present case,—every man in business to pay a guinea or half-a-guinea, or what you will, for registration; and the qualifications of Assistants and Apprentices registered

free, but the same fee of one or half-a-guinea to be paid on commencing business,—had this been done, the funds of the Society must have been very considerably augmented, and no one have just cause of complaint; whilst at present, the grumblings are low but deep. Many young men have complained to me of the hardship of having to pay a fee for the compulsory registration of what they think their vested rights, whilst their masters, who reap the most part of the profit of their labours, are exempt. There may, to some extent, be exaggeration in all this, but there is a considerable substratum of truth underneath, and the statements are in the main correct. Of course the expenses entailed in passing the Act were to be provided for, but it was hardly fair to expect that the chief part should be borne by those who may never reap its benefits, or to whom at least these benefits are deferred to the indefinite future.

Another matter to which I would allude is the apparent anomaly in titles, if not created, at least perpetuated, by the Act. We have "Members of the Pharmaceutical Society," "Pharmaceutical Chemists," "Chemists and Druggists," Associates, and Assistants. It would require a very discriminating outsider to distinguish the difference betwixt the first two titles, and yet, as you are aware, they do differ in a very essential degree. Would it not have been possible and advisable, whilst the new broom was at its work, to have swept one or more of these titles, or at least qualifications, away? I am of opinion that this might have been accomplished with ease, had the Pharmaceutical Society but swallowed the draught, sunk a portion of their old dignity, extended a more friendly hand to their half-brothers without the pale, and reduced the fees to a minimum, at same time admitting the present Assistants as Associates on paying also reduced fees, whilst of course they proved their ability by examination as at present. By these means there can be no doubt that the exchequer would have reaped a pretty rich harvest. That some such course as this was advisable is already seen by some members of the Society, and will become more apparent as the anomaly of titles is considered.

I have heard some young men complain of our local Board of Examiners, as if they were responsible for all the ills they suffer, and also of the severity of the examinations. Of course, so far as in my power I have endeavoured to dissipate these illusions; and it here affords me much pleasure to give my willing testimony on behalf of the examiners for their courtesy and style of examination, which, though scientific and technical in a certain degree, as indeed to be of any avail it must be, is at same time most thoroughly practical, giving the examinee every chance of showing the good that is in him, and avoiding the parade of their own knowledge by putting puzzling and extraneous questions. There is one member of the Board well known for his scientific attainments, and feared accordingly by all going forward for examination; and it was quite refreshing to find afterwards how pleasantly disappointing it was for this gentleman to be leading them on in a nice, easy, conversational manner to display the extent of their acquirements.

I make these remarks, as I have heard on some occasions contrary opinions expressed, and with the desire of inducing all interested to go forward at once, before the examinations get in reality more severe, as of course the longer the examiners are at the work, they may begin to break its monotony by getting somewhat more strict and technical.

So much for the Present.

Future.—And now, gentlemen, we come to what is really the most important matter for our consideration, What is the Future to be? We are told that "to-day is our own, to-morrow may know us not." This is certainly true of the individual, but not of the community. There is no use asking what the future will be, because it most certainly will be *what we choose to make it.* There is a responsibility attaching to all of us, even the most humble, in that we should leave some slight mark upon our time, and endeavour to hand down to our successors the legacy of an improved social standing, the opportunity of acquiring higher scientific attainments, and an elevated code of morals.

Let us begin then by giving the Future a fair start. Sinking all the petty jealousies of trade, let each accommodate the other in a friendly spirit. Let masters bend a little in their dignity towards their assistants, and endeavour to make them feel that their relative positions are not so much those of masters and servants as friends and helpers. Let assistants give their undivided attention and lay their whole energy to the advancement of their employers' interests, and perform their duties with faithfulness, diligence, and respect, looking upon their masters' reputation and good name as their own; and so upholding the dignity of the profession by their general conduct as to merit the ap-

probation and esteem of their employers, and the confidence of the medical profession and the public, without which neither master nor servant need ever hope to gain or hold any position of importance. I never like to hear young men speak disparagingly of their masters, for like the old saying about the bad workman and his tools, a bad assistant seldom meets with a good master, and is very unlikely to make a good master himself.

Let them at same time use their best efforts to ameliorate the condition of those under them as apprentices, by directing and helping them in their studies, and explaining the nature and value of their duties and position. I am sorry to say there is greatly too little of that done amongst us, and apprentices are left a good deal to their own resources in the acquirement of a knowledge of their profession. Of course a clever youth well grounded in general education will soon pick up a superficial knowledge, but that is to be guarded against, and by a little help now and again, the deeper mysteries are equally easy to surmount. At same time are laid the foundation of intimate friendships which may and ought to last for life. These are not small matters, and the assistant who conducts himself in all the respects I have enumerated cannot fail to rise in his self-esteem, and become a useful and respected member of society, and when his time comes will make a good master and merit success in life. Further, let both assistants and apprentices embrace every available opportunity of acquiring knowledge, professional, scientific, and general; for I can safely aver, from my own rather varied experience, that the older we get we find the more to learn, the greater need of learning, and the less time to learn in.

There are three special studies in which as a body we ought to excel; the first of these is Botany, in which I have no doubt the Examiners will bear me out in saying we are all very deficient; the second is Chemistry, which does receive a considerable amount of attention, but in which there is I believe more room for improvement than in any of the others; a recent writer (in, I believe, the 'Lancet,' a journal which has for long been devoted to sneering and cynical criticisms on our profession) remarks that chemists and druggists, so-called, know nothing of chemistry. Well, I think we do know a *little* about it, but in a scientific view we are undoubtedly deficient, and ought to strive to remove the reproach; the third study is one which we have no excuse for not being proficient in, viz. Materia Medica; there is a small but very select collection in the next room, and after what our friend Professor Archer has said to-night regarding the museum, which is attaining such eminence under his able supervision, it is needless for me to say that we in Edinburgh are highly favoured in that respect. These three studies are absolutely imperative on all who desire to obtain any eminence.

I should also like to urge the advisability of, and the good results likely to accrue from, the more frequent meeting together of all, old and young, connected with the profession for mutual improvement or amusement, and the interchange of ideas and discoveries.

I know there is and always has been in this city a want of combination and unanimity, especially amongst the younger members. I have myself been connected with several societies which were all allowed to degenerate and lapse for the want of a few willing and earnest helpers, from no want of talent, but, I am almost ashamed to say, indolence. I hope, however, now that the position of the chemist and druggist has obtained a legal footing, some of our friends in authority will take the lead in establishing a local society, such as are already in existence in other towns far behind us in facilities or numbers. Let it be a club-room, or news-room, or what you will, where every evening there may be a comfortable fire, an open library, and a table spread with a feast of literary magazines on trade and general subjects; in fact, put within the reach of all, a ready means of improvement. I may here remark, that in the programme of examination, Bentley's 'Manual' is taken as the standard, a volume which I and others in vain endeavoured to obtain, and which we find is out of print. Of course much the same information might be obtained from other sources, but it was difficult to find out the exact subjects treated of in the compass of a given number of pages of that book. After all parliamentary expenses have been provided for, I dare say there will still be a balance *in favour of Scotland* in the Society's strong-box, so that the requisite amount would not be missed, and this I think would be a worthy object on which to expend it; at same time, those who have paid their fees would recognize the desire of the parent Society to give them some equivalent for the outlay. I recommend the matter to the

careful consideration of the local members and examiners, whom I know to be animated by the desire to befriend their younger brethren, and I dare say some of them might even be induced to give a course of instruction before proceeding to examination.

One matter now remains for me to glance at, viz. remuneration. It must have occurred to many of you that the present scale is altogether inadequate and disproportionate to the outlay, time, talents, and constant personal care requisite to the faithful discharge of the duties imposed on chemists.

Apprentices must now of necessity be drawn from a higher and better educated class, and the examinations will deter many uneducated youths from entering a trade which has long been popularly but erroneously supposed to be the most lucrative under the sun; the result of this, I do not doubt, will be that for at least a time the numbers will decrease, and those who remain as assistants will have to be paid much larger salaries than the pittances which unfortunately rule at present. It has often been a problem to me how so many were able to live and decently clothe themselves on the paltry income derived from their occupation—an income which I know for a certainty would be sneered at by those in the same positions in other trades, even by artisans. This, I dare say, will shortly be rectified by force of circumstances; but I think it would be well, whilst the remembrance of a Pharmacy Act must still be fresh in the minds of the public, to gradually accustom them to look upon the profession as slightly elevated above the common occupations of life, that the prime cost of our wares is no criterion to their retail value, and that the labour and responsibility of dispensing medicines must be paid for on a different scale from the trimming a bonnet or patching a shoe.

That this is not already the case must be due in great measure to the low value which the great body of pharmaceutists have hitherto put upon their own services, and the first step towards a recognition of their true value is to take the initiative yourselves and look upon pharmacy as a learned profession, on your time as money, and on your services and acquirements as deserving some adequate reward. Gentlemen, when you do this, and arrange your scale of charges with such regard to your own abilities and deserts, the beginning of the good time will have arrived, and the future may then be looked forward to without fear for the visits of the house-agent or tax-gatherer; and we will then be enabled to lift the veil that shrouds it sufficiently far to see the trade elevated as a profession, practised by gentlemen whose proper position is acknowledged by society, and who, instead of taking the cue from the medical profession and being in a manner tolerated by them, may, by establishing a school of pharmacy, be enabled to teach them in return many a good lesson in dispensing and incompatibles, and a much needed reform of the caligraphic art in prescribing.

It is all very well to say you have your reward in spending your lives in the alleviation of human suffering, without soiling your fingers with the sordid brass; the theory is Howard-like, the practice Quixotic.

Allow me then, in conclusion, to express the hope that these anticipations of the enlightened future may soon be realized, and that every one, according to his station and abilities, may put his shoulder to the work and give a push upward for the general good.

Professor Archer thought that Mr. Leitch was quite wrong in finding fault with the fees which were exigible under the new Pharmacy Act. He could speak the more strongly upon this point, because he was what might be termed an outsider, and further remarked, that having had the privilege of becoming acquainted eighteen years ago with the prime mover in the attempt to gain for pharmacy a better footing and a higher position than it ever had in this country, he could assure the meeting the difficulties which had to be encountered, and which had been successfully overcome, were not few.

Mr. Mackay made some remarks on a few of the points noticed by Mr. Leitch, stating that many of the ideas thrown out had for some time been thoroughly canvassed both in the leaders and correspondence of the 'Pharmaceutical Journal,' and referred Mr. Leitch to some of them, where he would find the Society had been obliged from the pressure of circumstances to give way, in many of their views, to the wishes of a higher power, namely, the Government of this country. Mr. Mackay further stated, that as to the want expressed in reference to Professor Bentley's excellent 'Manual of Botany,' for which there had been such an extraordinary demand, with not a single copy to be had, the new edition was in the press, and might be expected to be ready for the bookseller some time in April at the latest.

Mr. J. Young remarked that the Society here ought to feel grateful to Mr. Leitch for having come forward so readily with a paper, and although he agreed with what Professor Archer and Mr. Mackay had said, yet he hoped, that as Mr. Leitch had hinted this effort, though the first, would not by any means be the last production the Society here would have the pleasure of hearing him read; and concluded by moving a cordial vote of thanks to Mr. Leitch for his communication. This was seconded and carried by acclamation.

PROVINCIAL TRANSACTIONS.

THE ABERDEEN ASSOCIATION OF ASSISTANT CHEMISTS AND DRUGGISTS.

The first annual festival of this Association came off very successfully in the Congregational Hall, Belmont Street, on the evening of Thursday, January 28th, when upwards of one hundred of the members and their friends assembled. Mr. J. Duncan, 57, Castle Street, in the chair.

After tea the Chairman delivered an able and instructive address on "Mental Culture," in which he pointed out the many advantages such an Association as this afforded to the members, in the means of their obtaining a large amount of useful information on many subjects relating to their business.

Mr. James Thom, President of the Association, also addressed the meeting on the history and objects of the Association, which had been in existence for nearly twelve months, and observed that its present condition augurs well for its future success. Its membership consists of nearly all the Assistant and Apprentice Druggists in the city, and its meetings, which are held fortnightly for the reading of papers and the discussion of subjects relating to pharmacy, are numerously attended. He also referred to the great benefits Assistants were deriving from the adoption of the early closing system in Aberdeen—benefits which were to be seen in the large attendance at the Classes for Materia Medica, Botany, and Chemistry, recently formed in the rooms of the Mechanics' Institution, and under the tuition of Dr. Robert Beveridge.

After the usual votes of thanks the company separated, highly gratified with the evening's entertainment.

The next business meeting of the Association takes place on March 2nd, the subject of paper being "Opium, its Characters, Compounds, Doses, Uses, and Abuses."

THE BRADFORD CHEMISTS' ASSOCIATION.

A number of the Chemists of this town, being impressed with the necessity for the existence of such an Association, resolved to call together the whole body of Chemists and Druggists carrying on business in the neighbourhood, with a view of testing the practicability of such an undertaking.

Accordingly, a circular was issued, convening a meeting on the 22nd December last, in the corridor of St. George's Hall, for the consideration of the subject, at which meeting the following resolution, being proposed by Mr. Priestley, and seconded by Mr. Stead, was carried unanimously:—

"Seeing that the Legislature has imposed great restrictions and onerous responsibilities upon those following the business of a chemist and druggist, this meeting is of opinion that it is desirable the members of the trade in this town form an Association, for the purpose of acting with greater unity; for discussing such matters as may arise affecting the interest of the trade; and for promoting the study of such branches of science as are requisite for apprentices and assistants to enable them to pass the necessary examinations of the Pharmaceutical Society."

At a meeting held subsequently in the Society's rooms, Salem Street, proof copies of the proposed rules were submitted for approval; and after some minor alterations, their adoption was moved and carried.

The following gentlemen were then appointed the Officers of the Society:—*President*, Mr. M. Rogerson; *Vice-President*, Mr. F. M. Rimmington; *Treasurer*, Mr. Thomas Harrison; *Hon. Secretary*, Mr. Herbert G. Rogerson. COMMITTEE:—Mr. Francis Bell, Mr. J. Boast, Mr. Joseph Hick, Mr. W. Cockshot, Mr. R. Parkinson, Ph.D., Mr. J. Walker.

Mr. F. M. Rimmington and Dr. Parkinson were deputed to negotiate with Mr. G. Ward, F.C.S., of Leeds, for the delivery of a series of lectures on Chemistry, having a direct bearing on the subject of Pharmacy, for the purpose of assisting students in preparing for the examinations of the Pharmaceutical Society.

The first of a preliminary course of twelve weekly lectures on the "Non-Metallic Elements" was delivered by Mr. Ward, in the Society's room, on Monday evening, February 8th, to an audience numerically most promising and encouraging.

The interest of the lecture was enhanced by a variety of instructive and pleasing experiments, familiar objects and substances being selected for illustration, and their nature and properties aptly and popularly explained.

As the Society grows older, other desirable and useful measures will in all probability present themselves for its consideration, neither last nor least among which ranks the curtailment of the rather protracted business hours usually observed here, so that students may be enabled successfully to prosecute their labours; the leisure time offered under the present *régime* being inadequate to the requirements of systematic study.

DUNDEE CHEMISTS AND DRUGGISTS' ASSOCIATION.

The usual monthly meeting of the Dundee Chemists and Druggists' Association was held in Lamb's Hotel on Wednesday evening, February 3rd, Mr. William Laird, Vice-President, in the chair. The paper for the evening was on "Botany," by Mr. Henderson, which subject he treated in a concise and lucid manner. At the close of his paper Mr. Henderson intimated his intention of presenting to the junior members of the Society a prize for the best collection of flowering plants gathered during the summer. This prize he meant as a stimulus to them to join at once the class about to be started for the prosecution of botany during the summer months; and as that science was one of the subjects for examination under the new Pharmacy Act, he trusted they would see the propriety of embracing the present favourable opportunity of making themselves proficient in such an important branch of their ordeal. He hoped to see a very full turn-out of members—juniors and seniors—at next meeting, when all arrangements could be made. One or two prizes for other subjects were spoken of, and will be brought forward in due time. Votes of thanks to the Chairman and to Mr. Henderson terminated the proceedings.

LEEDS CHEMISTS' ASSOCIATION.

The Fourth Meeting of the Session was held at the Philosophical Hall on January 20, 1869; the President, Mr. REYNOLDS, in the chair.

The Hon. Sec., Mr. YEWDALL, announced that Mr. Harvey had very kindly offered a prize of one guinea for the best collection of dried British plants made by Associates under twenty-one years of age between February 1 and November 1 of the present year; the other conditions to be similar to those adopted by the Pharmaceutical Society.

Stephenson and Churchill's 'Medical Botany,' in four volumes, was liberally presented by Messrs. Hirst, Brooke, and Hirst.

Mr. J. CHAPMAN WILSON, F.C.S., read the paper of the evening upon "Potable Waters." This was an interesting essay upon water supply in its various aspects, and noticed some facts of considerable local interest. Thus, at present, Leeds has a water supply of 8° to 10° of hardness on Clark's scale; but a new scheme is being carried out which will give a water of 4° to 5° of hardness. It is true that peat stain may be present in the new supply, but the lecturer regarded this as not unwholesome, and he was convinced that Spencer's process of filtration through "magnetic carbide of iron" would entirely remove the unsightly appearance.

Several members took part in the discussion, and the best thanks of the meeting were voted to the lecturer on the motion of Mr. THOMPSON, seconded by Mr. BEMROSE (late Senior Bell Scholar).

The Fifth Meeting was held on February 10; the PRESIDENT in the chair.

Mr. Sturdy was elected an Associate.

Mr. R. M. ATKINSON read the paper of the evening, upon "Tinctures, and their Preparation by the B. P. Method of Percolation." Mr. Atkinson referred to the combined system of maceration with percolation adopted by the B. P. for so large a number of tinctures, and expressed the want of some standard by which the pharmacist could test his operations. It was to contribute towards this supposed want that the experiments about to be detailed had been undertaken. The variation in the specific gravity of properly-made tinctures was much less than some persons had represented; and in confirmation of this the experiments of Mr. Laird, as reported to the British Pharmaceutical Conference, were quoted. The influence of light upon such tinctures as conium and digitalis was referred to, and the use of bottles of non-actinic glass advised. The nature of the deposit in tincture of rhubarb was next described. Proceeding to the process of the P. B., the author condemned the practice of some operators in using three-fourths of their spirit for the macerating process. He preferred to add to the solid ingredients enough spirit to form a thin paste, and after maceration for several days to add the remaining spirit in small and repeated quantities. Some operators have been led into error by overlooking the diminution in bulk which follows the dilution of alcohol with water. This amounts to 3·60 per cent. in the preparation of proof spirit. Tincture of opium, if macerated for several weeks according to the old practice of many chemists, certainly differs from the more expeditiously-made tincture of the B. P. Habitual laudanum-takers had often detected this difference, and complained of the alteration. Hence it seemed desirable to macerate for twenty-eight days at least. The paper concluded by presenting in a tabular form the results of many experiments in the preparation of tinctures by the method of the B. P.

Table giving Amount of Spirit required for each Pint of Tincture, with Specific Gravity, Weight of Solids Ordered, Weight of Marc Pressed, and Weight of Marc dried.

Tinctures.	Amount of spirit required.	To make pints.	Sp. gr. 60°.	Weight of solids used.	Weight of wet marc.	Weight of dried marc.
	oz. dr.			oz. gr.	gr.	gr.
Assafœtidæ . .	20 0	1	·8560	2½ 0	1533	547
Aurantii . . .	20 5	1	·9340	2 0	876	657
Benzoin . . .	17 0	1	·8950	4 160	438	190
Card. Co. . . .	19 1	1	·9569	3 60	814	446
Camph. Co. . .	20 0	1	·9252	0 110		24
Cinchon. Co. .	21 2	1	·9385	3 309	1851	1337
" " . .	22 0	1	·9365	3 309	1648	1085
Conii	22 0	1	·9265	2 219	1204	766
Calumbæ . . .	21 6	1			1252	1095
Digitalis . . .	21 1	1	·9365	2 219	983	598
Hyoscyami . .	21 2	1	·9323	2 219	1176	657
Gent. Co. . . .	21 0	1	·9415	2 219	2080	1204
Lavand. Co. . .	20 4	1	·9194	1 162	766	398
Sennæ	20 6	1	·9690	5 219	1600	1104
Quassiæ . . .	21 5	1	·9210	0 328	498	250
Opii	20 5	1	·9415	1 219	306	180
Guaiaci . . .	17 5	1	·9285	4 0	180	135
" . . .	18 0	1	·9310	4 0	303	146
Myrrhæ . . .	20 3	1	·8463	2 219	876	618
Rhei Co. . . .	21 4	1	·9307	2 328	1204	657
Tolu	18 4	1	·8774	2 219		20
Nuc. Vom. . .	21 5	1	·8412	2 0	1226	794
Jalapii . . .	20 7	1	·9364	2 219	858	508
Lobeliæ . . .	21 5	1	·9287	2 219	1186	730

The PRESIDENT acknowledged the obligations of the Society to Mr. Atkinson for his laborious records of results on this important subject. He regretted the uncertainty as to the state of comminution of the solid ingredients of tinctures in which the B. P. left chemists. The Pharmacopœia of the U. S. was much more explicit, and gave five degrees of coarseness, each indicated by the number of meshes per inch in the sieve used.

Many members took part in the subsequent discussion, and, on the motion of Mr. HORSFIELD, seconded by Mr. ABBOTT, the best thanks of the meeting were voted to the author of the paper.

LIVERPOOL CHEMISTS' ASSOCIATION.

Seventh General Meeting, held at the Royal Institution, January 21st, 1869; the President, Mr. J. ROBINSON, in the chair.

The following donations to the library were announced:—'The Modified Examination,' by Mr. Lescher; 'The Chemist and Druggist'; 'New York Druggists' Circular.'

The thanks of the meeting were passed to the donors.

Mr. SHAW mentioned three cases of poisoning reported in one day's paper, not one of which could have been prevented by the provisions of the new Act.

The PRESIDENT asked whether the artificial oil of bitter almonds was as poisonous as the real in the crude state.

The SECRETARY said that several cases of poisoning by nitrobenzol had been reported.

The PRESIDENT said that the purified oil of bitter almonds was not nearly so much used as the crude, and that it was complained that the purified oil had not so much flavour.

Mr. REDFORD asked if prussic acid could be again produced in the purified oil, as it had been asserted in the 'Pharmaceutical Journal' that it could.

The SECRETARY said that it was impossible, as the pure oil of bitter almonds did not contain nitrogen, without which prussic acid could not be formed.

CHARLES SYMES, Ph.D., then read a paper on "Practical Pharmacy."

The author first stated the difficulty he had in selecting a subject for the evening without encroaching on preoccupied ground; he thought, however, that the progressive nature of pharmacy would allow him to say a few words on its practice without attempting to supersede Mohr and Redwood's excellent work. He spoke of apprenticeship as the first process by which we become initiated into the art of pharmacy, and considered that youths rarely found their preconceived notions of its operations carried out in the duties they had to perform, weighing Epsom salts being the nearest approach to taking specific gravities, etc. Nevertheless, education is essential, a *good education* invaluable; it gives a power which nothing else can do. There are positions, perhaps, in which education creates dissatisfaction, but these are unfrequent.

Practical pharmacy in this country at present means anything between selling hairpins and brooches, and dispensing a carefully written prescription of an eminent physician; it would therefore be somewhat difficult to classify; there is just a slow gradation from the sublime to the ridiculous.

The highest aim, the object, and end of all pharmaceutical operations is supplying the public with medicinal substances in the most efficient form for the relief or cure of disease, and all processes which tend directly or indirectly to this end might be considered the essentials of the art of pharmacy. The retailing of drugs and chemicals in the condition in which they are purchased cannot be considered to involve much *art*, yet experience teaches that considerable care is necessary.

Mr. Symes then considered the portions of the Pharmacy Act intended to enforce this case, which in his opinion completely failed to effect the object intended. He thought that, having provided that the pharmaceutist of the future should be a well-educated, responsible man, he should have been left to conduct his business in the manner he considered most suitable to its safety. Several instances were quoted in which the carrying out of the Act to the letter would entirely destroy its object. Exception was also taken to that portion of the Act which allowed the restrictions to remain on all proprietary articles, but removed them from *patent medicines*, as tending to propagate quackery.

The author then referred to the progress pharmacy had made since the establishment

of the Pharmaceutical Society, and the room that still exists for improvement. He considered that the preparation and sale of dietetics had become an essential part of pharmacy, and further, that the pharmaceutist is as much justified in keeping homœopathic as patent medicines.

In conclusion, many points in practical dispensing were considered; the different results produced by differences of mixing or some slight impurities in the ingredients were illustrated by specimens. The members of the Society were called on to communicate from time to time their experiences, and thus in some measure to lighten the heavy burden of responsibility which is now borne by all who follow the profession of pharmacy.

A discussion ensued, in which Messrs. Hilditch, Abraham, Fanner, Mason, Sharp, and others took part; and the proceedings ended by a unanimous vote of thanks to Dr. Symes.

Eighth General Meeting, held February 4th, 1869; the President in the chair.

The SECRETARY explained the circumstances which had led to the omission of a report of Mr. Fraser's paper in the 'Pharmaceutical Journal'; an occurrence which he greatly regretted. He then announced donations to the library of 'The Pharmaceutical Journal'; 'The New York Druggists' Circular'; The Proceedings of the Liverpool Polytechnic Society; The Proceedings of the Liverpool Architectural Society; and to the museum of six specimens of dried herbs from Messrs. B. O. and G. C. Wilson, Boston, U.S., sent at the request of Dr. Edwards.

A vote of thanks was passed to the donors.

Mr. HENRY SUGDEN EVANS, F.R.M.S., etc., then read a paper on "Pharmaceutical Education."

He said that in the calling of pharmaceutists there are difficulties in the way of study, which tend to produce indifference to it, unless some external force be applied. Such a force now exists in the Pharmacy Act, and if this Act is not all that might be wished, it realizes the objects for which the Pharmaceutical Society has been striving for years. In future young men who enter the profession must have received a liberal education, and to the neglect of this qualification is due much of the ignorance now met with, and which is revealed to a deplorable extent by the recent Modified Examinations. If in the case of Assistants some little hardship is felt, it must be remembered that it is due to the action of Parliament, and not to the Pharmaceutical Society, which wished to avoid retrospective legislation. Many Assistants had, however, expressed their satisfaction at being obliged to study, and after passing the Modified Examination, were intending to prepare for the Minor and Major Examinations.

In the Modified Examination, more attention is paid to the general manner of the candidate as showing him to be a safe person to entrust with dispensing than to theoretical knowledge; hence practical dispensing, and reading and translating prescriptions, are the points most insisted on Great deficiencies in translating elegantly have been discovered, probably due to neglect on the part of masters.

The Special Examinations have not been very successful, and in twelve months will have ceased.

The First Examination, formerly called the Classical Examination, is more properly a matriculation examination, and will be required to be passed by *all candidates* before presenting themselves for the Minor Examination, which must be held in London; for, although a great desire prevails that local examinations should be held, the Privy Council have vetoed the proposition, from a fear that the examinations would not be uniform; and also, because they have the power to appoint a representative to attend the examinations, and this can be most conveniently done in London. Also, the number of examiners has been reduced.

Mr. EVANS then described in detail the course of the Minor and Major Examinations, and the mode of conducting them, observing, in regard to botany, that it is a branch of study not relished, and many excuses are given for ignorance of it. It is, however, most useful as a discipline to the mind, and it has been found that those who fail in botany also fail in materia medica. Botany should be the first study, and not a single hard word should be passed by without thoroughly understanding its meaning.

In conclusion, the author expressed his pleasure that the means of instruction were now afforded in Liverpool at the School of Pharmacy connected with the Association,

and earnestly exhorted all students to be thorough in doing their work, as the only way of ensuring success.

The PRESIDENT spoke highly of the paper as one conveying information of the greatest use to those who had to take these examinations, as it gave details which could not be included in a syllabus.

Mr. SHAW said that a new era had begun for pharmacy. In the examinations held since the passing of the Act, 143 candidates had presented themselves in London; 38 had passed in the Major, and 63 in the Minor. In the Modified Examinations, out of 268 applicants, 214 had passed. A rather higher proportion had passed in Scotland, and he regretted that Liverpool was much behind other towns. He proposed a vote of thanks to Mr. Evans.

Mr. SHARP said that one of those from Liverpool who had passed the Minor Examination in the last year had been a student in the School of Pharmacy. There is no reason to bemoan the position of this town, as sufficient time had not elapsed for young men to prepare themselves. He would prefer some other more practically useful study to botany, as a mere discipline to the mind, and thought that the great want of the student is good text-books. At present there are two kinds, one merely tabular and no good at all, and the other too elaborate. He had much pleasure in seconding the vote of thanks, which was then most warmly carried.

Mr. EVANS, in replying, expressed his pleasure at again attending the Association's meeting, and said that text-books would shortly be issued by the Pereira medallist of 1868.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

The Inaugural Meeting of this Society was held on Friday evening, February 12th, at the Exchange Rooms. There was a large attendance; Mr. J. H. ATHERTON, F.C.S., the President, occupied the chair, and after a few preliminary remarks, called on the Hon. Secretary, Mr. FITZHUGH, to read the report of the preliminary meeting.

The President then delivered the inaugural address, which want of space obliges us to omit.

A vote of thanks was accorded unanimously to the President for his interesting and practical address, and after an animated discussion on the provisions of the Petroleum Act, the meeting separated.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL ASSOCIATION.

The first monthly meeting of this Association was held on Wednesday evening, February 10th, in the large room of the Association at the back of the Music Hall, Surrey Street. There was a large attendance of members and associates.

Mr. HILL, the President, delivered his inaugural address, in which he congratulated his hearers on the formation of the Association for the purpose of carrying out the provisions of the Pharmacy Act, which had conferred great privileges on chemists and druggists. He referred to the arrangements made by the committee for courses of lectures on chemistry, materia medica, and botany, which, he observed, would of necessity call for considerable self-denial on the part of masters, and he trusted that apprentices and students, in addition to the privileges offered by the Association, would be induced to undertake self-education by entering upon a systematic course of reading and study at their own homes, by which means many had been enabled to prepare themselves for examination. He reminded them that, with the greater privileges, they would have more responsible duties. In conclusion, he noticed the seasonable present to the Association of specimens of Materia Medica, etc., from Messrs. Southall, Son, and Dymond, for which he was sure they all felt greatly indebted.

Mr. DOBB proposed, and Mr. WILSON seconded, a vote of thanks to Mr. Hill for his excellent address, which was carried unanimously.

Mr. WARD proposed, and Mr. HUDSON seconded, that the best thanks of the meeting be given to Messrs. Southall for their valuable present of Materia Medica specimens. Carried unanimously.

Mr. RADLEY proposed, and Mr. CARR seconded, that the Secretary write officially to certain persons for aid in the formation of museum and library. Carried.

Mr. WILSON then announced that the members of the committee had given about £20 towards the expenses of furnishing the rooms, and asked for aid from the members of the Association who had not yet contributed.

Mr. HARRISON, the Secretary, then announced that the meeting would be glad to hear that Messrs. Catley, Gouland, Collier, and Preston, and other gentlemen, had promised lectures and papers for the monthly meetings.

A vote of thanks was then passed to Mr. Hill, and the meeting separated.

YORK CHEMISTS' ASSOCIATION.

The Annual Meeting of the York Chemists' Association was held on Friday evening, the 5th February, at the King's Arms Hotel, the President, Mr. GEORGE DENNIS, being in the chair.

The report having been read, and the balance-sheet audited, the usual vote of thanks was accorded to the officials of the Society, who were unanimously re-elected, and the Annual Dinner was appointed to take place on Tuesday, the 23rd instant.

Appended is a copy of the Report.

FOURTH ANNUAL REPORT.

"Your Committee have great pleasure in presenting their Fourth Annual Report to the Members of the York Chemists' Association, and hope that the success which has hitherto attended their efforts in furthering the friendly feeling of the members of the trade may be long continued.

"In the spring and summer your Committee held several meetings to consider the Amended Pharmacy Bill and the Act for the storage of petroleum, when it was thought desirable there should be a general meeting of the Members, to discuss matters so intimately affecting their interests; your Hon. Secretary accordingly sent a circular to each Member, but through some unforeseen cause, none but a few of the Committee attended, and a great amount of trouble was caused to no purpose. The Committee, however, hope the Members in future will sustain them in their labours better than in the past.

"During the last Session of Parliament the Amended Pharmacy Bill (so long hoped for) was eventually passed, but it assumed a shape rather different to what was intended by its promoters and by this Society; along with a great deal of good, a considerable amount of evil has resulted from hasty and ignorant legislation, a penal Bill has been passed, and vexatious regulations introduced that really hamper and annoy the trade, and, at the same time, inconvenience the public, and some of them are positively ludicrous. Such legislation cannot long stand, as restrictions of the nature indicated must, of necessity, lead to non-observance and evasion, and to ultimate repeal.

"Your Committee consider a great mistake has been made; an educational Bill was all that was required, and after passing an examination, any person must have been competent to have conducted a business on his own responsibility, without being tied down by absurd regulations, which only expose the incompetence and ignorance of those who made them.

"Your Committee received an invitation from the Secretary of the Pharmaceutical Conference at Norwich to attend the meeting in connection with the British Association, but none of them finding it convenient to attend, your Hon. Secretary was obliged to politely decline it, at the same time thanking them for their courtesy and wishing them success.

"Taking into consideration the necessity that has arisen since the passing of the Pharmacy Act, that all assistants and apprentices should have an opportunity of qualifying themselves for the examinations of the Pharmaceutical Society, your Committee would recommend that a school or classes should be established in connection with this Association to facilitate the acquirement of knowledge in chemistry, botany, etc., as required by the Pharmacy Act.

"The Storage of Petroleum Bill came into operation on the 1st inst., and needs the

immediate attention of the trade, as licences have to be obtained from the local authority, which, in York, is the Board of Health Committee.

"Your Committee would recommend the Annual Dinner to take place at the King's Arms Hotel, on Tuesday the 23rd inst., and hope to have a good attendance of Members to join in the festivity."

Appended is the usual statement of accounts for the past year, showing a balance in hand of £6. 13*s*. 3*d*.

Receipts.	£	*s*.	*d*.
To Balance in hand and Subscriptions, 1868	16	6	7

Expenditure.	£	*s*.	*d*.
To Postages, Stationery, Meetings, Sundries, and Annual Dinner	9	13	4
Balance in hand	6	13	3
	£16	6	7

Signed—George Dennis, Chairman.
Thomas Cooper, Treasurer.
John Brown, Secretary.

York, February 5th, 1869.

ORIGINAL AND EXTRACTED ARTICLES.

NOTES ON THE AIR OF BRISTOL, AND ITS ANALYSIS.

BY W. W. STODDART, F.G.S., F.C.S.

(*Abstract of Paper read before the Bath Pharmaceutical Association.*)

After a few introductory remarks the author said that any one living in a town, and who had visited the habitations of his poorer brethren, must have noticed the close atmosphere, the animal odour, and the indescribable "something" which oppressed his senses, and caused his respiratory organs to instinctively rebel.

It is also very singular that the smell pervading a town house is distinctly different from that in a country cottage.

All this had attracted the attention of the author, who during the last eight or ten years had made a series of analytical experiments, the results of which were laid before the meeting.

The constantly drinking bad water poisons the human frame in the most direct manner, and the author thought that breathing impure air was not less dangerous, although the ill effects may be more indirect in their progress. Moral as well as physical depravity will inseparably be found in the man who cares little for fresh air in his dwelling; both his person and his mind become equally "dirty."

The atmosphere is a wonderfully perfect provision of our Creator for the continuance of our well-being; and as its purity and free access to every living creature are absolute necessities, equally wonderful and perfect means are provided for its purification, whenever it becomes charged with noxious gases, which otherwise would slowly but certainly shorten animal life.

Nature's great disinfectant, "the law of diffusion," has been at work ever since the world began, preserving us in health and strength.

Our mode of living in what we term civilized life is the cause of half the ills that flesh is heir to; bad drainage and close rooms form a hotbed for epidemics, which by their very presence show man to be the dirtiest of animals.

By a diagram it was shown that the existences of plants and animals were mutually dependent upon each other; both are furnished with organs for sustaining life by receiving food and rejecting that which has been used up, so that the normal balance may be sustained.

Now, let the least preponderance be on either side, health will fail, sickness be generated, and the whole ruined.

The atmosphere is a vast mechanical mixture of the atoms of oxygen and nitrogen, carbonic acid and ammonia, floating in a medium of the greatest tenuity. Two of these (oxygen and nitrogen) are constant in their proportion, while the carbonic acid and ammonia are very variable, always depending on the condition of the earth's surface and of its living occupants.

The normal composition of pure atmospheric air may be regarded as,—

Oxygen	2,096	volumes.
Nitrogen	7,900	,,
Carbonic Acid	4	,,
	10,000	volumes.

The ammonia is usually present in the proportion of one-millionth.

Like all other things, the atmosphere is subject to the law of gravitation; and as the attracting force decreases as the square of the distance from the attracting body, so that portion of the air nearest the earth's surface is the densest and possesses the greatest specific gravity.

Calculations have shown that the greatest *quantity* of the atmosphere exists within 20 miles of the mean sea-level.

Oxygen is of course the most important of the component gases in air, and the active agent by which all the offices of the atmosphere are effected, especially as regards animal life.

We find it existing in two conditions, first as we commonly know it, and secondly as ozone. (A few experiments were exhibited to prove that atmospheric air contained about one-fifth of its volume of oxygen gas.)

Oxygen is most active when existing as ozone, instantly decomposing organic matter, possessing strong bleaching powers and a peculiar odour.

It is found abundantly near the sea, and in the open country, but the moment it comes in contact with the crowded houses of a town it instantly disappears.

The author then described the various processes for preparing ozone, and showed Deane's apparatus, which he was in the habit of using in his experiments, and exhibited solutions of brown sugar and sulphate of indigo perfectly bleached by a current of ozonized air.

The most recent ideas respecting the nature of ozone and the tests for its presence were explained, and the importance of ventilation and the consequences of an overcharge of carbonic acid were fully entered into.

Although so great a quantity of this gas is evolved from volcanoes, manufactories, etc., yet it is present in the atmosphere of the open country, only in the pretty constant proportion of 4 in 10,000, the rest being absorbed by vegetation.

Widely different, however is it in towns and crowded buildings, for in them the air is highly charged with carbonic acid.

A closed room insufficiently ventilated soon becomes oppressive with this deleterious gas, which soon depresses the vital powers.

It must also be remembered that the breath is loaded with effete organic matter which is rapidly putrescible; the amount in a room where many people have been living, being generally proportionate to the percentage of carbonic acid.

With this idea in view, the author had, for some time past, occasionally examined the air taken from various places in Bristol, the percentage being calculated from the resultant carbonate of lime or barium as the case may be. The actual results of nearly forty of these analyses were placed before the members, with the analytical apparatus used.

This was the usual series of tubes and bulbs, the air being gently drawn through by means of an aspirator, the only difference being that Geissler's modification of the potash bulbs was preferred to the ordinary form.

To give some idea of the state of town air, the following analyses are given to show the great increase of carbonic acid that is sometimes present. How any of the inmates existed in health, or anything approaching to it, is hardly imaginable, and fortunate, indeed, is it for the citizens, that the sanitary law of diffusion cannot be stopped:—

Analytical Table of the Air in Bristol, showing the volumes of Carbonic Acid present in 10,000 *volumes.*

(The average proportion in pure air being 4 per 10,000.)

1. Parlour of a dwelling-house	7·8	23. St. Michael' Hill	4·5
2. Bedroom of a dwelling-house	28·0	24. Fremantle Square	3·6
3. Lodging house	106·9*	25. Charles Street	5·3
4. Infants' schoolroom	24·5	26. St. Augustine's, back	4·7
5. Workroom	29·1	27. Barton Street	6·9
6. North Street (March)	5·73	28. Ashley Hill	2·21
7. North Street (June)	4·09	29. Marsh Street	7·6
8. Wine Street (November)	6·68	30. Clare Street	4·95
9. Temple Street	15·44	31. House in Little James's Street	88·3*
10. Lewin's Mead	16·95	32. Nelson Street	7·2
11. A ragged school	126·7*	33. Portwall Lane	8·2
12. Avon Street	11·95	34. House in Davies's Court	97·6*
13. Stoke's Croft	3·6	35. Harrow Weir	6·12
14. College Green	4·6	36. A Printer's Workroom	35·6
15. St. James's Churchyard	8·5	37. Redcliffe Street	8·23
16. Schoolroom	22·8	38. House in Lewin's Mead (lodging)	115·0*
17. Full Moon Yard	4·3	39. Guildhall (crowded)	3·57
18. Maryleport Street	9·71	40. Room in Infant School	114·3*
19. Love Street	6·67	41. Durdham Down (West Wind)	2·05
20. Ashley Road	3·9	42. Durdham Down (East Wind)	3·24
21. Sewer in North Street	48·4	43. St. Phillips	9·24
22. Host Street	17·5		

Six of these (marked by an asterisk) show more carbonic acid gas present than in a sewer!! We seem to do all we can to frustrate nature's efforts to help us: we shut up every door and window, close every crevice, enclose our beds with a dense array of curtains, and then, as if we could not get rid of the oxygen fast enough, often destroy more by burning a gas jet in our bedrooms.

The final burying our heads under the bedclothes consummates our evil contrivances, for breathing that vitiated air which our pulses are throbbing to get rid of.

When our babes are born, they are very commonly wrapped up in flannel enclosed in an atmosphere saturated with animal exhalations.

We have Dr. Lankester's experienced opinion that thus many infants are killed, being really suffocated by breathing air from which the oxygen has been extracted by their own lungs.

The author then proceeded to notice the presence of sulphurous and sulphuric acids, and sulphide of ammonium, which are often present in notable quantities.

The paper was concluded by describing the organic matter which had been found in the air of crowded apartments. This impurity is greasy, very offensive in its odour, and adheres tightly to the windows and furniture, requiring the use of soap and water for its complete removal.

After a few days' deposition, it begins to ferment and teem with infusorial life.

A drawing of some of these (of course highly magnified) was passed round the room, and the several organisms described.

There were three species of infusoria (*Bacterium termo*, *Monas inanis*, and *Vibrio prolifer*), besides siliceous vegetable cells that probably derived their origin from the excreta of horses; some were cells that resembled those from skin or leather; others could not be determined that were mixed with mineral fragments, that very likely owed their origin to road dust.

The smell emanating from the room where these were collected was intensely disgusting, nevertheless the author could not induce the inhabitant to open a window or clean a thing.

For collecting and estimating the amount of organic matter, the air was passed through a plug of asbestos, and an acidulated solution of permanganate of potassium.

An approximate estimation of the organic matter was thus obtained.

In this manner 3 *grains*, and sometimes 5, were obtained from a few cubic feet of air.

Why should we wonder then, with a falling barometer and a close damp atmosphere, that a medical inspector should be necessary, or that without knowing why, we go for change of air?

The paper was fully illustrated with diagrams and analytical apparatus.

PHARMACEUTICAL ETHICS.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—After speculating vaguely upon the blank pages of my 'Sale of Poisons Book,' Davis's edition, which remain to this day innocent of contamination from Schedule A, I am led to reflect upon the mixed motives concerned in the production of an Act of Parliament, which often give to it a character not intended by its promoters. Thus we, who have spent more than a quarter of a century in endeavouring to obtain legislative definition of the qualification of Pharmaceutical Chemists, *and compulsory powers to restrict the practice of pharmacy to those who possess that qualification*, find that our efforts are ultimately rewarded by the passing of "An Act to regulate the Sale of Poisons." This looks like asking for bread and receiving a stone; but, thanks to the judicious action of those who represented the trade, the parliamentary hobby for restricting (!) the sale of poisons has carried us safely over the parliamentary antipathy to trade privileges, and we have really got what we desired, although it does come like a blessing in disguise.

We may possibly think that these poison regulations would have been better left alone, and that Parliament would have acted more wisely if, having limited the sale of poisons to competent persons, it had left them to the exercise of their own discretion under a sense of their responsibility. We should not then have been placed in the absurd dilemma of either labelling syrup of poppies "Poison" in defiance of common sense, or of incurring a penalty of £5 for default. It is said that an enterprising and original pharmaceutist of this city has adroitly escaped the difficulty by adopting the following formula for his labels:—

"Syrup of Poppies.
Poison (by Act of Parliament)."

Such incongruities will, no doubt, be rectified in time, and we need not fear that the poison regulations will occasion *us* much inconvenience; the more important question is whether they will afford that protection to the public which was intended. But as registration cannot prevent, although it may facilitate

the detection of accident or crime, it is not easy to see what security it will give. The sale of poisons is now expressly legalized, and the conditions are so explicitly laid down, and moreover are so easily complied with, that any real obstacle to the purchase of poison ceases, if our vigilance is limited to a literal observance of the law; for, singularly enough, there is no provision against the sale of poisons for purposes which we may deem improper or know to be unsafe. Thus, we certainly *may* sell an ounce of prussic acid to any *mauvais sujet* who professes his intention to poison a cat, but in the presence of statutory prescription of the conditions under which poisons may be sold, it seems doubtful whether (if those conditions are complied with) we may withhold it without becoming liable for consequential damages. This question is so purely legal, that it would be satisfactory to have it ascertained upon competent authority for our guidance.

Those provisions of the Act which affect our qualification and privileges are, however, by far the most interesting to us, and it is not too much to say that they mark the most important epoch that pharmacy ever has or ever will know. At such an era it is important that we should shape our new course in the right direction; and it is to be hoped that some of our most experienced and influential members will help the truly *practical* discussion of pharmaceutical ethics by giving the right impulse, at an opportune season, in reference to many points which need to be more satisfactorily organized before pharmacy can assume its rightful position. I venture to suggest two.

The first is the admixture of miscellaneous trade with pharmacy proper. It must be within the observation of all that miscellaneous trade occupies a much more prominent position in our shops than it formerly did. Subjected as we have been to unrestricted competition, and under the influence of the modern system of prescribing which has seriously diminished the profits of dispensing, this was perhaps inevitable. At any rate, it has obtained almost universally. How is it to be dealt with? Is it expedient, in the pursuit of a regenerated pharmacy, that the miscellaneous trade should be discountenanced? I cannot think that any rule can be laid down upon this point, but that it must be determined by the good sense and good feeling of the individual pharmaceutist with reference to the specialities of his case. We may, however, expect that the post of honour shall be conceded to pharmacy, and that under all circumstances, variable as they may be, the supremacy of pharmacy shall be upheld, and that nothing shall be allowed to interfere with the provision of every needful accommodation for the efficient discharge of the responsible duties of dispensing. There can be no doubt that a complete isolation from the disturbance and distraction of retail business is one of the necessities of dispensing, yet how rarely is this provided! I only know one case in which the arrangements in this respect are completely satisfactory; and let me add, for the honour of old institutions, that this is one of the "historic" London houses.

While the encroachment of miscellaneous trade upon pharmacy has been going on, as above described, other changes have taken place which aggravate the danger of the intermixture. Our Materia Medica has not only been greatly extended, but it comprehends an entirely different class of remedies to those formerly in use; remedies of greater potency, and requiring exceptional care in their manipulation. Dispensing has, in consequence become a much more critical duty than it was in the good old days, when alkaloids were unknown, and when oldfashioned chemists knew no better than to make infusions by pouring boiling water upon the several ingredients, in the manner which, by the bye, is still preserved in our Pharmacopœias.* Such operations as those of modern

* It may not be amiss to remark that the use of concentrated infusions is obviously an infringement of Clause 15, and subjects the offender to a penalty of £5.

dispensing cannot safely be mixed up with a bustling miscellaneous trade; it is impossible to expect accuracy from a dispenser subject to interruptions from customers passing in and out, and liable to be called off at a critical moment to exhibit smelling-bottles, or to vend sponges. Each department should be absolutely distinct, carried on by a distinct staff, and in portions of the premises distinctly set apart.

It may be objected, that such arrangements are only possible in large establishments, and to an extent this may be true. To whatever extent it is true, it is an argument in favour of large establishments; and I sincerely wish that the larger establishments would set the good example so generally that we, smaller fry, might be compelled to follow. It is natural that improvement should begin with the leaders, and be followed by the rank and file; and it may be expected that the operation of the Pharmacy Act would assist such a movement by increasing the importance, while it restricts the number of pharmacies.

The second point to which I would call attention is the unsatisfactory position of "apprenticeship."

It is well known that there is the greatest difficulty in placing apprentices in eligible houses of business where they will have a really good opportunity of acquiring a practical knowledge of the several branches of their business. There is an especial objection (for obvious reasons) on the part of firms whose dispensing practice is considerable; that is to say, of firms with whom apprentices could learn that which it is most essential they should be taught. This difficulty is not only coincident with, but is partly the consequence of the advances which pharmacy and pharmaceutical education have made in recent years. But such an effect from such a cause is an anomaly.

It is simply impossible that progress and improvement should be necessarily antagonistic to one of its own elements; and the training of an apprentice is a most important element in the advancement of pharmacy.

Where, then, is the discord? I think in this—that we have not remodelled the institution of apprenticeship in accord with the changes which have taken place around it. We persevere in the folly of trying to insert an old patch in a new garment, and affect surprise because they do not harmonize. The truth is that the institution of apprenticeship requires complete revision. The circumstances of to-day are totally different from those of old, but the theory of apprenticeship has undergone no corresponding change. In the old days there was little knowledge demanded but practical skill, and exercise in practical duties was the only instruction given or expected. In this way the master initiated his apprentice into the art and mystery of pharmacy, but that is not sufficient now, and the relations of master and apprentice must be based upon a different understanding.

The apprenticeship of a pharmaceutist must, in fact, be assimilated to that of a surgeon or solicitor; it must be regarded as a period of study in which the pupil will be trained in the exercise of his calling under the direction of his master, but will learn the theory and science upon which it is based from other sources. To suppose that a master is under obligation to give his apprentice the scientific instruction now required, is to suppose that he will sacrifice his own duties for an inadequate motive and an insignificant remuneration, and is, of course, sheer nonsense. It is obviously his duty to afford the opportunity for obtaining this instruction, and the hours of attendance in business should be regulated so as to allow ample leisure for that purpose. One great difficulty in the way of receiving apprentices will be obviated by making apprenticeship an outdoor arrangement. Changes in the habits of people render the responsibility of an apprentice's domestic life irksome to a principal, and there is no reason why the practice should be perpetuated while the new circumstances are more conveniently met by the other alternative. It is assumed

that the apprentice's services would be reckoned as of no value, and that there would be no objection to curtailing the hours of business so as to meet the requirements of study and recreation. Punctuality and strict attention to business during the appointed hours would of course be insisted upon. The term of apprenticeship should be limited to three years, and the introduction which would thus be obtained in a good house of business in the several departments of laboratory, dispensary, and shop, would be better value for the fee than the old-style lengthy servitude in second-rate shops without laboratory, and often with an insignificant share of dispensing, where the services rendered constituted a main element in the consideration, and too often became a source of discontent on the one side and dissatisfaction on the other. The expense of such a system of apprenticeship as is here sketched need not greatly exceed that of the custom which it is intended to replace (the scientific education being a necessary addition under any system), while it would leave the apprentice at liberty to take a salaried situation at the end of three years, and would relieve the master from the intolerable responsibility of guardianship. Of course, there is nothing to prevent an arrangement being made between the parties for the lodging, maintenance, and supervision of the apprentice if it is mutually convenient, but looking at the question in its general aspect, it would greatly facilitate the admission of apprentices into first-class houses if the institution of apprenticeship was dissociated from this usage.

I have not attempted to do more than briefly to outline points for discussion. My object would not be attained by an elaborate essay representing the opinions, perhaps the bias, of a single mind, but requires the concurrence of numbers and influence. Whether the views here advanced are right or wrong, this fact will scarcely be disputed, that the best houses—especially the highest-class dispensing houses—are closed against apprentices, and the practical education of the future representatives of pharmacy is thereby exposed to great disadvantage.

Such a fact is disastrous; its cause is not obscure. Surely the appropriate remedy can be devised.

Yours respectfully,

Clifton, January 26, 1869. RICHARD W. GILES.

NOTES AND ABSTRACTS IN CHEMISTRY AND PHARMACY.

BY C. H. WOOD, F.C.S.

Use of Phosphorus in Medicine; Phosphorized Oil.

During the past year several communications have been made to the Société de Pharmacie of Paris, on the best means of preparing a solution of phosphorus of definite strength for administration in medicine. The therapeutic action of this substance has been extensively studied latterly by French physicians; and in the treatment of paralysis and certain nervous diseases especially, phosphorus has been advantageously employed. The administration of this dangerous and poisonous agent, however, is attended with considerable difficulty; and the attention of pharmaceutists was therefore directed to the production of solutions of phosphorus which should be uniform in character and perfectly definite in strength. Sulphide of carbon is, *par excellence*, the solvent of phosphorus, but it exerts such an injurious action on the human system, that its use is entirely precluded. Ether, chloroform, and oil are the solvents which have been employed. Solutions in each of these menstrua have been prepared, and put up in gelatinous capsules, adjusting the quantity in such a manner that each capsule should contain the same amount of phosphorus—namely, 1 milligramme (0·015 grain, or about one-seventieth of a grain). This method of ad-

ministration in capsules possesses several advantages: it is acceptable to the patient, it prevents the oxidation of the phosphorus, and it admits of a ready and accurate apportionment of the doses. The solution of phosphorus in ether has not furnished good results. The solubility of phosphorus in ether is very slight, and is only effected after long maceration. A capsule to contain 1 milligramme of phosphorus must hold 40 to 60 centigrammes of ether (7 or 8 grains). When several of these capsules are taken for a dose, so large an amount of ether produces gastric disturbances.

Chloroform has constituted a more advantageous solvent than ether. One hundred parts of chloroform readily dissolve, at the ordinary temperature, two parts of phosphorus. Small capsules containing 10 centigrammes ($1\frac{1}{2}$ grain) of this solution have been administered with excellent results. After the treatment has been continued for some time, however, unpleasant symptoms are produced; heat in the stomach, loss of appetite, and vomiting are apt to occur: these effects were at first attributed to the phosphorus, but M. Dujardin-Beaumetz now considers them to be, in great part, due to the irritant action of the chloroform on the gastric mucus.

It results that almond oil has proved itself to be the best and most unobjectionable menstruum for the administration of phosphorus. Patients have taken twelve or thirteen capsules of phosphorized oil a day without experiencing any inconvenience or digestive disturbance,—a result not to be obtained with the other preparations. A process for the preparation of phosphorized oil is given in the French Codex of 1866. It directs 2 grammes of phosphorus to be dissolved in 100 grammes of sweet almond oil by the heat of a water-bath, the solution to be cooled, and the clear oil subsequently decanted from the deposit of crystallized phosphorus. M. C. Méhu has carefully examined this method of operating, and finds the product to be, in several respects, unsatisfactory. The quantity of phosphorus which separates out on cooling is a variable amount, depending on the time allowed, the temperature, and the age and quality of the oil employed. The exact amount of phosphorus retained in solution is never known, and thus the dose of the preparation becomes uncertain. In many pharmacies the solution would not be kept in stock, but prepared as wanted; consequently, it would often be used before sufficient time had been allowed for the full amount of deposit to take place. Moreover, when phosphorus is dissolved in ordinary sweet oil of almonds, there is a manifest action of the phosphorus on the organic principles (albumen, resins, etc.) which the natural oil holds in solution. A yellow deposit gradually forms, becoming red by exposure to light, augmenting by time, and carrying with it a part of the phosphorus. It is not easy to decant the limpid oil from this separated matter, and filtration is impossible because of the injury which such exposure to air causes to the preparation.

Some observers have regarded this deposit as amorphous phosphorus, formed by the action of light on the solution; but M. Méhu has demonstrated that this is not the case, and has designed a very ingenious process by which phosphorized oil may be easily obtained limpid, colourless, perfectly definite in strength, and unchangeable either by time or by exposure to light, provided contact with air be avoided. M. Méhu's experiments have materially contributed to facilitate the medicinal administration of phosphorus.

Preparation of Phosphorized Oil.—Some sweet oil of almonds, of a good quality, is heated in a porcelain capsule for about a quarter of an hour to a temperature of 150° C. (302° F.), then the heat is raised to near 250° (482° F.), and maintained at that point for ten or fifteen minutes longer. At first the vapour of water is disengaged, then certain alterable organic matters are destroyed or volatilized, and at the same time the oil becomes almost completely colourless.

Filtration renders this superheated oil perfectly bright and limpid, but if

time is no object, it may be allowed to stand and deposit. The oil thus prepared is used for dissolving the phosphorus. A small flask or phial, perfectly dried, and furnished with a well-fitting stopper, is filled to nine-tenths of its capacity with the oil, the weight of the oil introduced being noted. An amount of phosphorus, exactly the hundredth part of the weight of the oil, is then added, taking care to select good transparent phosphorus, freed from any white or red coating. Thus as many centigrammes of phosphorus are taken as there are grammes of oil in the bottle (or 4·4 grains for each ounce). The phial is then placed in a water-bath, and unstoppered two or three times, without agitation, to allow of the escape of the expanded air. When the temperature of the oil has reached 80° or 90° (180° F.), the phial is finally closed, and shaken strongly several times until solution is complete. The phosphorus dissolves rapidly, the oil remains unchanged in appearance, and no deposit is formed on cooling. The product is permanently clear and colourless, and will remain unaffected by exposure to solar light. It is perfectly definite in strength, containing exactly one per cent. of phosphorus.

M. Méhu has carefully determined the extent of solubility of phosphorus in almond oil at ordinary temperatures. He finds that the prepared oil can permanently retain in solution one-eightieth of its weight (1·25 per cent.) of phosphorus without crystallizing, but that with one-seventieth several crystals are ultimately deposited.

The oil prepared as above is phosphorescent in the dark; on opening the bottles containing it, the air-space is filled with a magnificent phosphorescent vapour, and even in strong light a whitish cloud is visible.

The phosphorus must be reduced to the proportion of 1 part in 500 before this phosphorescence ceases. For several reasons M. Méhu appears to prefer this weaker solution to the stronger one. But the addition of a few drops of ether, of turpentine, or of certain essential oils is capable of entirely arresting the phenomenon. Ether answers especially well for the purpose. By replacing 20 per cent. of the oil by the same weight of pure ether, a solution is obtained of the same strength, but which manifests no phosphorescence, and is consequently better preserved from the action of the air. Moreover it is better suited to patients who have to employ the oil in the night. When the solution is used as a lotion, the ether may be replaced by essence of turpentine. Of course in preparing the etherized solution, the phosphorus must be dissolved in the prepared almond oil in the proportion of 1 part to 80, and the ether added after this has cooled down again to the ordinary temperature. The essential oils of bergamot, citron, lavender, mace, mustard, rosemary, mint, and thyme have also the power of arresting phosphorescence; but camphor and the oils of anise, bitter almonds, cajuput, citronel, fennel, geranium, and in fact all those which contain oxygen, have not this power.

Phosphorized Cacao Butter.

It is easy to dissolve one per cent. of phosphorus in cacao butter, but if this fat has not been previously heated to 150° C. (302° F.), and then filtered, the product obtained is yellowish-brown instead of being perfectly white. This preparation should therefore be made in the same manner as the phosphorized oil. M. Méhu recommends both the phosphorized cacao butter and the phosphorized oil to be administered in capsules as already described.

Employment of Phosphide of Zinc in Medicine.

M. Vigier and Dr. Curie have recommended the use of phosphide of zinc in cases where the administration of phosphorus is indicated. This substance is a grey crystallized body, perfectly definite in composition, unaltered by moist air, and keeping well, either in powder or in pills; but nevertheless easily decomposed in the stomach, and capable of exercising an action on the system identical

with that produced by phosphorized oil. Phosphide of zinc is selected in preference to the other metallic phosphides, because it is at once perfectly stable, and easily decomposed by weak acids. Even lactic acid attacks it, evolving phosphoretted hydrogen; according to Messrs. Vigier and Curie this explains the action which occurs in the stomach. Phosphide of zinc is prepared by passing the vapour of phosphorus over zinc heated to ebullition, in a current of dry hydrogen.

The authors administer it in doses of one milligramme (0·015 grain) several times a day. It is given either in the form of pilules or of powder.

Soluble Peroxide of Iron.

M. Jeannel points out that hydrated peroxide of iron retains ammonia, which cannot be removed by washing with water. According to this chemist, the presence of this ammonia causes the molecular transformation which after some days renders the oxide of iron insoluble in weak acids, even though it be kept under water. In like manner sulphuric acid or soluble sulphates immediately induces a similar change.

To prepare hydrated oxide of iron, which shall preserve indefinitely its soluble character, M. Jeannel recommends the following method :—pure perchloride of iron is precipitated by excess of ammonia, the resulting oxide is washed with *distilled* water until all the ammoniacal salt is removed, and then with water acidulated with one or two parts of hydrochloric acid in a thousand. This saturates and removes the ammonia. The precipitate retains hydrochloric acid, but it is stable, and soluble in weak dilute acids and even in water. The oxide thus prepared can be dried at the ordinary temperature, or even on a water-bath without losing its solubility.

Nitrate of iron may be employed in the place of perchloride, and nitric instead of hydrochloric acid.

Action of Ammonia on Phosphorus.

M. Blondlot has published some very interesting and curious experiments on the action of ammonia on phosphorus. If a piece of phosphorus be kept in a strong solution of ammonia it becomes first brownish, then green, and finally deep black. At the same time that these changes of colour are occurring, the phosphorus becomes hard and brittle; it cracks and splits, and will ultimately fall to powder. These effects are produced more or less rapidly according to circumstances. Solar light is remarkably favourable to the change, causing it to become manifest in several days, and to be terminated in a few months, while in the dark more than a year is required for its accomplishment. The most concentrated ammonia produces the most rapid and decided change. When the phosphorus has become black it may be easily rubbed down to fine powder in a mortar with some water. It may then be dried in the air on a water bath. If it retains any unchanged phosphorus, which would cause its ignition, this may be removed by washing with sulphide of carbon. Passed through a fine sieve it constitutes an intense black impalpable powder, which may be preserved under water without sensible alteration; but, if exposed dry to the air, it slowly evolves a trace of ammonia, and little by little becomes yellow. In this new state it resembles amorphous phosphorus in several of its chemical characters, although in some others it differs considerably, and notably in colour. The yellow powder, heated in a tube to 200° C., evolves some phosphoretted hydrogen, and passes to ordinary amorphous phosphorus. Treated with ammonia, it reassumes in the course of an hour its original black colour. M. Blondlot has not yet accurately determined the chemical nature of these changes, but he is inclined to regard the powder as containing solid hydride of phosphorus and hydrated amorphous phosphorus.

MILK OF SULPHUR.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—In the Pharmaceutical Journal for last month I see that objections were raised to the use of pure milk of sulphur, because it will not readily mix with water. Being an advocate for the sale of pure drugs, I beg to say that pure milk of sulphur may be made to mix *easily* with water, if it be first mixed into cream with a little wine or spirit and water. I find by experiment that the smallest proportion of wine that can be used with success is 30m to a teaspoonful of milk of sulphur; it is better, however, to use a teaspoonful for each teaspoonful of milk of sulphur.

With regard to public preference for the impure article, I may say that I have sold the pure preparation only for the last three years, and find that when I explain that the better-looking article contains three parts of plaster of Paris (a term better understood than sulphate of lime) in every four, my customers invariably prefer the pure, and will ask for it at other shops. My experience with regard to calamine is the same. The difference in therapeutic effect is so great between the impure article usually sold and the pure calamine, that those who have once purchased the latter will send from a distance to me for it.

If you think that these remarks may lead any one to sell the pure articles who has not hitherto done so, please insert this letter in your valuable Journal.

I am, Gentlemen, yours, etc.,

EDWARD M. HOLMES, M.P.S. (by Exam.).

2, *Arundel Crescent, Plymouth, February* 15*th*, 1869.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Dear Sir,—I was much surprised on reading Dr. Attfield's remarks on milk of sulphur in the Journal for this month to find that the impure article was still so generally sold; being under the impression that it was a thing of the past, and that specimens were only to be obtained as a curiosity in some antiquated pharmacy or veterinary emporium. Certainly Southampton Row would have been the last place I should have expected to have found any. But my surprise was mingled with deep regret to find that gentlemen holding high positions in our Society could say a word in its favour,—Dr. Redwood, by a circuitous course of argument, trying to show that an article containing some 50 or 60 per cent. of inert, insoluble, and infusible matter, was not adulterated; and Mr. Morson advising us to retrace our steps and keep a discarded and inferior article in stock, on the plea that the public sometimes prefer it.

Dr. Redwood says, "Milk of sulphur was one thing and precipitated sulphur another." I cannot say how long the doctor has been of that opinion, but on referring to page 885 of his second edition of 'Gray's Supplement,' he states just the contrary; saying that lac sulphur, sulphur precipitate, and milk of sulphur are synonymous and equivalent terms; a note adding that "it should be a fine, pale yellow powder, inodorous, and should perfectly volatilize in the fire."

As to the statement that the public prefer the impure article, I think, if statistics could be obtained, it would be found greatly exaggerated. As the results of my own experience, I may say that for many years I have sold none but the pure, and during the whole time have never had a complaint as to any difficulty in mixing it, or as to excess or defect in its action. At first a few objected to the colour being different, but a word of explanation satisfied their doubts. I

think it unwise, impolitic, and unbecoming our position as pharmaceutists, to pander to uneducated or depraved popular tastes in these matters. Rather let us endeavour to elevate them to a higher standard, by selling only genuine and unadulterated drugs, and abide the consequences. If we offend the ignorant few, we shall gain the intelligent many; otherwise, to be consistent, we ought, for instance, to revert to the old-fashioned, lumpy, and discoloured plumbi acet., and zinci sulph., instead of selling the pure and beautifully crystalline salts we are now supplied with, because some ancient farrier or village doctor prefers them, and hates "new-fangled notions."

Whilst on the subject, I am reminded of ung. cetacei. How many apprentices can well remember the various devices resorted to, to obtain a *white* ointment, —violent and long continued stirring, aq. rosæ and liq. potassæ being the usual adjuncts, not forgetting a liberal percentage of adeps ppt.! Alas! all was sacrificed to appearance; how soon it went rancid, and how inferior was the product to the agreeably emollient but pale yellow ointment of the P.L. or P.B.! Those who have once tried the latter on an excoriated and painful surface, speak highly of its soothing and cooling effects. In conclusion, the public will thank us, in the long-run, for calling their attention to these popular fallacies, and be willing to remunerate us fairly for our services.

I am, dear Sir, yours truly,

WILLIAM YOUNG.

116, *Balls Pond Road, February* 8, 1869.

POISONOUS DYES.

Judging by some facts which have recently come to our knowledge, the poisonous effects of certain dyes, applied externally or swallowed, will soon attract a considerable share of public attention. We allude more particularly to the dyes of the aniline series, respecting two of which, known abroad as *coralline rouge* and *coralline jaune*, Tardieu, professor of legal medicine at Paris, made a very important communication to the Academy of Sciences on the 1st inst., of which the following is an abstract:—In the month of May, 1868, Tardieu was consulted by a young man, twenty-three years of age, quite healthy and free from herpetic rash, who had been attacked in both feet with a very acute and very painful vesicular eruption exactly limited to the part of the foot covered by the shoe, and tracing on the skin the perfectly regular form of the "pump" which he wore. The skin was violently inflamed, swollen, of a uniform red colour, covered with innumerable small vesicles, uniting to form large bullæ filled with a sero-purulent liquid. The eruption was attended by general *malaise*, fever, headache, and pain over the heart. The seat and form of the eruption led Tardieu at once to the conclusion that its cause was entirely local; and he did not hesitate to trace it to what the young man was wearing on the foot. He had only a few days previously taken into wear some socks of red silk of a very elegant and fashionable colour.

Some time after this, a young man, a friend of his, was affected precisely in the same way from the same cause. Later still, in the month of September, the papers published a letter, in which M. Bidard, professor of chemistry at Rouen, described a similar observation which he had made on a pair of socks sent to him by an Englishman, and which presented, on a lilac ground, circular lines in silk of a bright red tint. The inflammation of the skin of the feet was limited to the parts in contact with the red lines. The lilac colour was given by the violet of aniline, the red by coralline. Lastly, it is but a few days since the Paris journals gave the case of an American lady, who, having worn stockings of red silk, found her legs covered with blisters, some of which had ulcerated; and she suffered from giddiness and severe pains.

Tardieu, assisted by M. Roussin, submitted the socks worn by the first patient seen by him to a careful examination. They were treated by boiling alcohol, in which the red colouring matter quickly dissolved. This alcoholic solution, evaporated to dryness, yielded an extract of which the poisonous properties were proved by the experiments now to be described.

The dry colouring matter, redissolved in a small quantity of alcohol, was injected under the skin of the thigh of a dog, a rabbit, and a frog. The three animals died: the frog the same day, after four hours; the dog the next day, after having survived thirty-six hours; the rabbit not till the day following. The dog and the rabbit had excessive and incessant evacuations. The experimenters then determined to try the coralline itself. In order to obtain it, they applied to M. Persoz, jun., who discovered it in the year 1860, and who placed at their disposal three specimens: the first a pure coralline, the second the red coralline of commerce, the third the yellow coralline. The coralline, or *péonine*, is obtained from rosolic acid, which is itself a derivative by oxidation from phenic acid. It is formed in a close vessel, heated to 150 degrees, by the contact of rosolic acid and ammonia. The result is a solid matter, in plates, of a poppy-red colour, green, or dull yellow, by reflected light, nearly insoluble in water, soluble in alcohol and oils, and which has all the characters of an amidic acid.

A quantity of the alcoholic solution containing $2\frac{1}{3}$ grains of solid coralline was injected under the skin of a dog of medium size. The next day, and the day after, it was dispirited and depressed, suffered from well-marked intestinal derangements and loss of appetite, and the thigh near the seat of the injection had become painful. The animal showed signs of suffering, and walked lame. The fourth day a quantity equivalent to 3 grains of coralline was injected. The symptoms reappeared almost immediately, the alvine evacuations returned, the weakness continued to increase, the fever grew more and more intense, and the pain in the thigh became more acute. The animal trembled and could not support itself, its eye grew dim, and it died the third day after the second injection. A rabbit, after a single injection containing $1\frac{1}{2}$ grains of pure coralline, died in four hours with the same symptoms. Less than $\frac{3}{4}$ of a grain of the colouring matter killed a frog still more quickly.

The examination of the viscera of the animals so poisoned was full of interest. At the point where the coralline had passed under the skin, there was acute inflammation of the cellular tissue, with purulent infiltration. The stomach was healthy, but the intestines, enormously distended with fluid, bore distinct traces of acute inflammation of the mucous membrane. The liver had undergone fatty degeneration. Lastly (and this is the essential character of the poisoning), the lungs in the dog, and still more in the rabbit, appeared as if themselves stained by the colouring matter, and presented throughout a very beautiful scarlet tint, which spread uniformly over their surface, so as to efface the lobular divisions and the vessels ramifying upon them.

M. Roussin, by an ingenious process, succeeded in dyeing red a skein of silk with the colouring matter taken from the liver and lungs of the poisoned animals. In this way the coralline, which had been the cause of the poisoning, was detected by the characteristic property of the colouring matter, just as atropine and digitaline are identified by the power they respectively possess of dilating the pupil, and arresting the heart's beat. It was a new application, as happy as unexpected, of the physiological and experimental method now so largely used in the detection of organic poisons.

Coralline, then, is doubtless a very energetic poison. When introduced into the living body, even in a small dose, it may cause death. It belongs to a class of bodies which is every day increasing with the incessant progress of the chemical arts; and it affords a new example of the importance, both for hygiene and legal medicine, of following the march and progress of industry, and of studying the influence which its recent conquests may exercise on the health of human beings.—*Les Mondes, par M. l'Abbé Moigno, 4 Février* 1869.

AN ANTIDOTE TO SNAKE-POISON.

We have received from a correspondent, recently arrived in this country from Australia, an account of Professor Halford's experiments on animals, with the view of discovering an agent which should avert the poisonous effects of the bites of venomous snakes. The subject has recently attracted a large amount of attention in that country, owing to the professor having employed his remedy—a solution of ammonia injected into the veins—with success in the case of a man exhibiting all the symptoms of snake-poisoning in a dangerous degree. We take our account from a contemporary. A man was bitten by a venomous snake, which he had taken into his hands, supposing it to be

dead. Not long afterwards he became drowsy, and mentioned the occurrence to one of his mates. The latter immediately set about procuring medical assistance, but by the time it arrived the man was comatose, and his lower extremities paralysed. Galvanism and other usual remedies were applied, but without effect. In this extremity the medical man first called in caused Dr. Halford to be telegraphed for. The case was the first opportunity he had had of applying his new treatment to a human being, and he at first felt some hesitation in resorting to it. An incision, however, was made through the skin, exposing the superficial radial vein, and the point of the syringe being introduced into the vein, the injection (of ammonia) was completed. The beneficial effect was immediate. From an almost pulseless state, and from a stupor verging on death, the patient speedily became conscious. He has been steadily recovering since, and he is now reported to be nearly well. Whether the earlier treatment in any way contributed to the cure cannot, perhaps, be certainly known, but there appears to be little doubt—medical men entertain none—that the case must have ended fatally but for Professor Halford's treatment. We require, of course, some further cases before the merit of the discovery can be determined. Ammonia is not a new remedy for snake-bites, but Dr. Halford has the credit unquestionably of having applied it in a direct way by injection into the blood, so that its effects should be immediate and general. Its application in this way could only be safe in skilled hands. The discovery was not fortuitous, but resulted from a consideration of the microscopical alterations which he found taking place in the blood-vessels of animals subjected to the snake-poison. It is only right to add, however, that the observations of Dr. Fayrer and others have failed to verify the statements made by Dr. Halford on the altered condition of the blood-corpuscles. We learn from a letter which Dr. Halford addressed to the 'Melbourne Argus,' that he had previously instituted a series of experiments on the lower animals, and he publishes five of them which he performed on dogs. In four instances the treatment was successful. To carry out the treatment a solution of ammonia—of the strength of one part of strongest liquor ammoniæ to two parts of distilled water—and an ordinary hypodermic syringe are required. The ammonia is thrown directly, but gradually, into the blood by puncturing any superficial vein, and may be repeated as its beneficial operation ceases.—*Lancet, January* 30, 1869.

With reference to the above, "a late resident in India" observes ('Times,' February 1) that the attention of Indian residents is not needed, as the Bombay Government, upwards of six years since, ordered the following remedy, with directions for its use, to be kept at every police-station throughout the Presidency; "a late resident in India" thinks that instead of having to apply to a surgeon to inject the liquor into the veins, this remedy, which is given internally, can be applied by any one, and, in his opinion, is equally efficacious.

Liquor Ammoniæ Fortis for Snake-Bites.—*Doses.* For an adult, 35 drops in 4½ tolas of water (a wineglassful); 12 to 15 years old, 20 to 25 drops in 2½ ditto; 8 to 12 years old, 15 to 20 drops in 2 ditto; 4 to 8 years old, 10 to 15 drops in 1½ ditto; infants to 4 years old, 3 to 10 drops in 1½ ditto.

ACCIDENTAL POISONING BY CARBOLIC ACID.

At the Derby Infirmary on Friday, January 22nd, a female nurse supplied one of the patients, John Waite, with what she thought was his medicine, but which proved to be a lotion ordered to be applied to his thigh. The man took a dose of this lotion, and several hours elapsed before the mistake was discovered. The remedies tried were of no avail, and the poor fellow died. The jury returned a verdict that "the deceased died from the administration of carbolic acid and oil taken in mistake."

SELLING POISON WITHOUT A LABEL.

On Wednesday, at the Bingley petty sessions, before Mr. W. Dunlop (chairman), and Mr. J. Craven, Mr. George Gill, druggist, Chapel-lane, Bingley, was charged (under the

new Act of Parliament) with selling poison—namely, one ounce of laudanum, on the 12th instant, the same not being properly labelled with the name of the seller printed thereon. It was alleged that the laudanum was sold to a girl aged ten years, named Mary Ann Barrett. It appeared from the evidence that the child had on several occasions fetched laudanum both from Mr. Gill's and other druggists in the town for an afflicted relation. On the day named she went to the shop of the defendant for one ounce of laudanum, taking with her a bottle used for the purpose, upon which there was a proper label belonging to another druggist. She was served by the defendant's wife, who did not make use of the label required by the Act when poisons are sold. This was discovered by Dr. Ruffe when visiting the relation referred to. He took possession of the bottle, and gave information to the police. Mr. Gill pleaded not guilty to the charge, and would have called his wife to prove his innocence, but this could not be allowed. The Chairman, after consulting with his brother magistrates, said that it was their opinion there had been a breach of the law; but the offence was so slight that they would only mark it by a fine of 6*d.* and costs.—*Leeds Mercury, January 22nd*, 1869.

PHYSIOLOGICAL ACTION OF THÊINE.

Chemical analysis has shown that tea contains the same crystallizable, nitrogenized principles as coffee and cocoa. Dr. Leven conceived that it would be useful to determine by experiments whether the physiological effects were the same. Having already experimented with caffeine (see Amer. Journ. Med. Sci. for April, 1868, p. 525), he determined to experiment with théine on frogs and guinea pigs. The following are his conclusions:—

1st. Théine and caffeine, considered as one and the same alkaloid by chemists, seem to produce different toxic effects on animals submitted to their action.

2nd. Théine is a less powerful toxic than caffeine, and it is only when given in double doses that the former produces the toxic effects of the latter.

3rd. Théine also produces convulsive movements in the limbs, which Dr. L. has not observed from the action of caffeine.

4th. In other respects their physiological effects are identical. Both alkaloids seem to directly excite the heart and respiratory movements, and to increase arterial tension. By exciting the circulation they stimulate the central nervous system, the brain, and spinal marrow, but they do not arrest the functions of the spinal cord and nerves. The tetanic convulsion resulting from their action is caused by the stimulation of the spinal cord. They do not abolish the functions of muscle; the heart does not cease to beat immediately after death.—*Amer. Journ. of Pharmacy, from Archives de Physiologie Normale et Pathologique, May and June*, 1868.

NOTE ON WINE OF COLCHICUM-SEED.

BY JAMES T. KING.

Complaints having been made that some wine of colchicum seed (English) failed to produce its peculiar effects in several cases, even when its administration was run up to teaspoonful doses every four hours, until several ounces were taken, I was induced to make an examination of the wine, to ascertain if it was so deficient in the active principle.

The following method was adopted:—From a bottle bearing the label of the English manufacturers, and having the seal over the cork unbroken, one fluid ounce was taken, placed in a porcelain capsule, about one grain of oxalic acid added, and the wine allowed to evaporate spontaneously to the consistence of a soft extract.

This extract was exhausted with two drachms of distilled water and filtered, the filtrate slightly supersaturated with liquor potassæ, and two fluid drachms of pure chloroform were then added in a test tube, and the mixture thoroughly agitated several times.

The chloroform was allowed to settle, and then the contents of the test tube poured slowly into a small separating funnel. When the chloroform had become clear, it was run off into a small capsule and spontaneously evaporated, leaving a small amount of yellowish-green residue.

This was treated with one drachm of distilled water, to which had been added two drops of dilute sulphuric acid, then filtered, to filtrate added one drop of Mayer's test,—the $\frac{1}{10}$ normal solution of iodohydrargyrate of potassium,—but obtained not the slightest reaction or trace of a precipitate, showing the wine to contain little or none of the colchicia. To prove that this method would determine the presence of the active principle, one fluid ounce of some wine of colchicum that we made from a fair lot of seeds according to the U. S. P. was treated in precisely the same manner as above described, and, on the addition of one drop of the test liquor, a copious canary-coloured precipitate was obtained.

Four drops of the test solution were required to precipitate all of the alkaloid.

Physicians report this wine as efficient and active, corroborating the chemical test.—*American Journal of Pharmacy.*

ON LIQUID FUEL.

BY BENJAMIN H. PAUL, ESQ.

(*Continued from page* 106.)

The following tabular statement will show the manner in which the heat that is consumed in producing a chimney draught, is distributed among the combustion products constituting the furnace gas:—

Combustion of Carbon.

	Furnace gas from 1 lb. carbon.	Quantities of heat in furnace gas.	Equivalent evaporation of water at 212° F.
	lbs.	Heat units.	lbs.
Carbonic acid gas	3·67	600° × ·8 = 480	·5
Nitrogen gas	8·94	600° × 2·2 = 1,320	1·4
Surplus air	11·61	600° × 2·8 = 1,680	1·7
	24·22	3,480	3·6

It will be seen from this table that while the total waste of heat in the furnace gas from the combustion of 1 pound of carbon, is equivalent to 3·6 pounds of steam, more than one-half of that heat is consumed in raising the temperature of the surplus air supplied for diluting the combustion product in the furnace. Consequently, any arrangement by which this surplus supply of air could be dispensed with, and combustion maintained at the same rate, would have the effect of reducing the waste of heat to the extent of 50 per cent., and economizing the heat generated by the carbon of the fuel to the extent of nearly 12 per cent. Herein consists the advantage gained by blowing the air into a furnace, instead of drawing it in by means of a chimney; for in that case the supply of air may be reduced to just enough to support combustion, and, at the same time, the temperature of the furnace gas may be so far reduced, either within the flues or tubes of the boiler, or in a feed-water heater, as to render the greater part of the heat contained in it effective for production of steam.

The possibility of economizing, in this way, the heat generated by combustion of carbon is by no means unimportant; but it is of far greater importance as regards the heat generated by combustion of hydrogen; for in that case the total waste of heat arising from the discharge of the furnace gas at 600° F. above the temperature of the

air supply is equivalent to about 12 pounds of steam per pound of hydrogen burnt, and nearly one-half of this waste heat is consumed in heating the surplus air supply.

Therefore, by dispensing with this surplus air, and cooling the furnace gas in a feed-water heater, a saving of something like one-fourth of the total available heat might be effected. A further advantage would also result from the increased temperature of combustion, viz. 4692° F. for carbon, and 4922° F. for hydrogen, and the consequent more ready transmission of heat from the combustion product to the water in the boiler.

Combustion of Hydrogen.

	Furnace-gas from 1 lb. hydrogen.	Quantities of heat in furnace-gas.	Equivalent evaporation of water at 212° F.
	lbs.	Heat units.	lbs.
Water vapour	9·00	600° × 4·3 = 2,580	2·7
Nitrogen gas	26·78	600° × 6·6 = 3,960	4·1
Surplus air	34·78	600° × 8·3 = 4,980	5·1
	70·56	11,520	11·9
		Latent heat of water vapour . 8,695	9·0
		20,215	20·9

The combustion of the carbon and hydrogen of fuel presents another point of difference, which is important as regards the extent to which the available heat is, under ordinary conditions, capable of being rendered effective in producing steam. This difference is due to the presence of water-vapour in the furnace gas, resulting from the combustion of hydrogen. As a consequence of this circumstance, a large amount of heat is absorbed and rendered ineffective for producing steam. From the foregoing table, representing the disposition of heat amongst the furnace gas, it will be seen that every pound of water-vapour in the furnace gas corresponds to a waste of heat sufficient to produce rather more than $1\frac{1}{4}$ pound of steam; and hence it will be evident how great is the disadvantage resulting from the presence of water in the furnace gas, whether originating from hydrogen burnt or from damp fuel or otherwise.

The volumes of the air supply and combustion products for the extreme cases of carbon and hydrogen are as follows:—

	Air supply at 60° F.			Combustion products at 660° F.	
	Pound.	Pounds.	Cubic feet.	Pounds.	Cubic feet.
Carbon	1	24	320	25	630
Hydrogen	1	69	960	70	2,044

In the combustion of carbon there is no expansion of volume in the combustion product, except that due to the heat generated, which would render the volume at the temperature of combustion (2522° F.) rather more than six times that of the air supplied. By the transfer of heat to the boiler, to such an extent as to reduce the temperature to 660° F., the volume would be reduced again to about 630 cubic feet per pound of carbon burnt.

In the combustion of hydrogen the supply of air required is about three times as large as that required in the combustion of an equal weight of carbon. There is also an expansion of the combustion products, independent of the heat generated, and amounting to one-half the normal volume of the hydrogen burnt. The expansion due to heat is also greater than in the combustion of carbon, on account of the greater amount of heat generated, so that the volume of the furnace gas at the temperature of combustion (2791° F.) would be about six and a half times that of the air supplied, and the volume

of gas discharged into the chimney would be about three and a half times as great as in the combustion of an equal weight of carbon. This larger quantity of gas will, however, contain nearly four times as much effective heat as that resulting from the combustion of an equal weight of carbon, and its temperature will be about 270° higher, so that in this respect the use of fuel containing a large amount of hydrogen, provided it can be perfectly and readily burnt, presents an advantage as compared with fuel consisting almost entirely of carbon. Rather more than one-fourth of a pound of hydrogen would give as much effective heat as one pound of carbon with a somewhat smaller volume of combustion products. The extent to which this advantage affects the value or efficiency of fuel will, of course, depend on the amount of hydrogen it contains. Since no hydrocarbon available as fuel contains more than 15 per cent. of hydrogen, the actual evaporative efficacy of such a material, when used under the ordinary conditions, cannot, at the utmost, be more than about 40 per cent. greater than that of an equal weight of carbon. This, assuming it to be perfectly burnt, and the arrangement of boiler-flues or tubes, etc., to be favourable for the transfer of heat, is the maximum effect to be looked for according to the data already given.

The amount of hydrogen in petroleum is probably larger than in any of the other hydrocarbons proposed to be used as fuel, and that contains, on the average, about 13 per cent. In coal and shale oil the amount of hydrogen is less. Consequently, the evaporative efficacy of these materials, as compared with carbon, would not reach the above limit of 40 per cent. in excess. The ratio between these materials and ordinarily good coal is much about the same in regard to evaporative efficacy, since the hydrogen contained in coal compensates for the oxygen and ash it contains, unless the amount of these is very considerable.

The tables in next page show the relation between the total heat of combustion and the available heat of hydrocarbons, containing respectively 14 and 25 per cent. of hydrogen, as the amounts of heat consumed in the furnace gas, and the mode in which it is disposed of.

I am not aware of any liquid hydrocarbon applicable as fuel, which contains so much as 25 per cent. of hydrogen, so that an evaporative effect of about 16 pounds of steam per pound of hydrocarbon burnt must be regarded as the maximum result to be attained with such material used as fuel. By burning these hydrocarbons with only just enough air for combustion, or half the qualities assumed to be supplied in the above estimations, the effect capable of being realized would be from 13 to 14 per cent. greater than in the case stated above, or about 18 pounds of steam per pound of hydrocarbon containing 14 to 15 per cent. of hydrogen.

The plan of using liquid fuel, which so far as I am aware has proved the most advantageous, is one which does, to some extent at any rate, secure the advantage to be gained by forcing air into the furnace. According to this plan the oil is supplied to the furnace through a small pipe, together with a jet of high pressure steam, by which it is converted into spray, much in the same manner as, in the toy known as the perfume vaporizer, a liquid is blown out of a bottle by a current of air. The steam-jet at the same time induces a current of air which mixes with the oil spray and supports its combustion. This is the arrangement used by Messrs. Field and Aydon, and it appears to work exceedingly well, effecting a very perfect combustion of the oil. The oil I have seen used in this way was the dead oil, or creasote oil, which is a refuse product in the refining of gas-tar. It possesses characters which render it much preferable to petroleum, or to the oil obtained by distilling coal at a low heat for use as liquid fuel. In the first place, its density being greater than that of water—the gallon weighing about 12 pounds—it takes less space for stowage than petroleum or coal oil, the gallon of which weighs only from 8 to 8½ pounds. For the same reason it would not be so dangerous as the lighter oils in case of accident; for instead of floating on the surface of water and burning, it would sink harmlessly. Again, its very high boiling-point, approaching to a red heat, and the great density of its vapour as compared with that of petroleum or coal oil, are great advantages as regards risk of explosion in consequence of the oil-vapour becoming mixed with air, and then catching fire. This could hardly take place with the dead oil, except at a very high temperature, while petroleum readily gives off vapour to the air at a moderate degree of heat.

One pound of hydrocarbon, containing 14 per cent. of hydrogen, yields about 31 pounds of furnace gas, consisting of:—

	Furnace gas.	Quantities of heat in furnace gas.	Equivalent evaporation of water.	
			at 212°	at 60°
	lbs.	Heat units.	lbs.	lbs.
Carbonic acid gas	3·16	411		
Water-vapour	1·26	359		
Nitrogen gas	11·45	1,683		
Surplus air	14·37	2,124	2·2	
	30·74	4,577	4·8	
Total heat of combustion		21,154		
Latent heat of water-vapour		1,217	1·3	
Available heat		19,937		
Waste heat of furnace gas		4,577	4·8	
Effective heat		15,360	15·8	13·6
Theoretical evaporative power		...	21·9	
Relative evaporative efficacy as compared with carbon or coal=1 . .				1·39

One pound of hydrocarbon, containing 25 per cent. of hydrogen, yields about 36 pounds of furnace gas, containing:—

	Quantities.	Quantities of heat in furnace gas.	Equivalent evaporation of water.	
			at 212°	at 60°
	lbs.	Heat units.	lbs.	lbs.
Carbonic acid gas	2·75	358		
Water-vapour	2·25	641		
Nitrogen gas	13·39	1,968		
Surplus air	17·39	2,483	2·6	
	35·78	5,450	5·6	
Total heat of combustion		26,283		
Latent heat of vapour		2,174	2·2	
Available heat		24,109		
Waste heat of furnace gas		5,450	5·6	
Effective heat		18,659	19·3	16·6
Theoretical evaporative power		...	27·1	
Relative evaporative efficacy as compared with carbon or coal=1 . . .				1·69

The use of this oil as fuel presents great advantages for gas-tar distillers, with whom it is a troublesome waste product. If it should come into demand as steam-fuel its value would of course rise above that of coal, to an extent proportionate to its greater

efficacy and any other advantages resulting from its application as steam fuel. Such an application might therefore be a great advantage to gas companies.

Unfortunately the quantity of this oil which is available is very small as compared with the requirements of steam navigation, probably not amounting to 100,000 tons a year in the whole country, and therefore its application must be very limited.

(*To be continued.*)

ON ALLOYS AND THEIR USES.

(*Abstract of a Lecture delivered at the Royal Institution by Professor Augustus Matthiessen, F.R.S.*)

The object of this discourse was to show experimentally why alloys are used in preference to their component metals.

Alloys may be, chemically considered, divided into three classes:—

1. Chemical combinations.
2. Mechanical mixtures.
3. Solutions of the one metal in the other which has become solid, or, for shortness' sake, solidified solutions of the one metal in the other.

Under the term chemical combination such alloys may be considered which are the result of the combination of two metals when these unite together with great energy and evolution of heat, producing an alloy the physical and chemical properties of which we cannot foresee. As an example of such alloys those of gold, with tin, lead, or zinc may be quoted; for if to melted tin, lead, or zinc, gold be added, the two metals unite together with great energy, and produce an alloy which is exceedingly brittle and totally unfit for practical purposes.

It is for this reason that the more expensive metals, silver and copper, are used for alloying gold for the purposes of coinage, etc.

With regard to such alloys as may be looked upon as mechanical mixtures, like oil and water, or rather as ether and water,—for no two metals are known which, like oil and water, do not dissolve at all in one another; but a few metals are known which, like ether and water, dissolve slightly in one another, for ether will dissolve a certain amount of water, and water a certain amount of ether. If ether and water be mixed together, say in equal parts, two layers will be formed, the top one being ether containing a little water, the lower one water containing a little ether. Two metals, for instance, which behave in exactly a similar manner to ether and water are lead and zinc, for lead when fused with zinc will dissolve 1·6 per cent. zinc, and zinc in its turn will take up 1·2 per cent. lead.

If these two metals be fused together, say in equal parts, they will separate into two layers, like ether and water, the top one, being the specifically lighter, zinc, with a small percentage of lead, the lower one lead, with a small percentage of zinc. If such an alloy be made and cast in a mould, the difference in the behaviour of the two ends may be easily shown; for the top one is so brittle that it cannot be bent without breaking, whereas the lower one may be bent with ease.

Such chemical combinations and mechanical mixtures are, however, comparatively rare; and for alloys in common use, practice has almost invariably chosen such alloys as may be considered as belonging to the third class, rejecting those of the first and second as worthless for practical purposes.

Under the term solidified solutions of the one metal in the other, such alloys may be considered, which, like the chlorides of potassium and sodium when fused together, produce a mass having some of the physical properties totally different from those of the component salts. It cannot be assumed that the chloride of sodium enters into chemical combination with the chloride of potassium. One important property of a solidified solution is, that the components are homogeneously diffused in one another, so that even under the most powerful microscope they can no longer be distinguished from one another.

Alloys are used because they possess certain physical properties to a far greater extent than their component metals. The physical properties may be divided into two classes.

1. Those which in all cases are imparted to the alloy, approximately in the ratio in which they are possessed by the component metals.

2. Those which in some cases are, and in others are not imparted to the alloy in the ratio in which they are possessed by the component metals.

To the first belong specific gravity, specific heat, and expansion due to heat. It is easy to show this experimentally; the specific gravity of an alloy may be shown to be equal to the mean of those of its component metals, by hanging on the one side of a balance the alloy and on the other side the metals composing it unalloyed, and then placing them both in water.

The specific heat of an alloy may be proved equal to that of its components by placing the alloy and its components in boiling water, and then in equal volumes of cold water; when the rise of temperature in the two cases will be found the same, as may be shown by a differential-air thermometer.

A brass bar placed in any apparatus for showing expansion by heat is seen to expand exactly as much as a composite bar, of which one portion is of copper, the other of zinc, —the length of the zinc portion being proportional to the amount of zinc in brass.

To the second class of physical properties belong, conduction for heat and electricity, hardness, tenacity, etc.

As a basis for the conclusion which will be drawn, the electric conducting power for alloys may be taken. Researches into this subject have shown that when tin, lead, zinc, or cadmium are alloyed together, such alloys conduct electricity in the ratio of the relative volumes of the component metals, whilst in all other cases no such simple relation exists between the conducting power of the metals and their alloys. If, for instance, gold be alloyed with silver, say in equal volumes, the conducting power of an alloy will be 15, that of silver being 100, and that of gold 80.

If curves be drawn to represent the conducting power of different series of alloys, three typical forms will be observed: the first represented by nearly a straight line, the second by the letter *L*, and the third by the letter U.

Wiedemann and Franz have proved experimentally that the values obtained for the conducting power of metals and alloys, for heat and electricity, are identically the same; and the truth of this statement may be shown by the following experiment:—If bars of gold and silver and some gold-silver alloys be fixed, so that one end of all of them is in a hot-water box and the other end in the bulb of a small air-thermometer, the depression in the columns of the liquid in the tubes of the air-thermometers will indicate the relative conducting powers (approximately) of the several bars; and if through the tops of the columns of liquid a line be drawn, such line will form a curve similar to that referred to as obtained for the electric conducting power.

That this is true is thus shown:—

By the side of this apparatus is placed another of this construction:—Into the bulbs of several air-thermometers are fixed wires of the same size and length, and of the same materials as were used in the heat-conducting experiment. One end of each wire is soldered to one thick copper-wire, and the other end to another similar wire. These two wires are connected to the poles of a battery. The current will then divide itself, and a portion will pass through every wire proportional to the conducting power of that wire. This current will heat the wire and cause the liquid in the tubes connected with the air-thermometers to descend, and the line drawn through the top of the columns will be nearly similar to the curve already mentioned, which is formed by the bulbs in which the heat-conducting bars are fixed.

The analogy between the relation existing in this case and in some others may be shown experimentally as follows:—

Sonority. When bars of alloys and their component metals are struck, a great difference will be found in the note produced; and in almost every case where the experiment has been made, the most sonorous alloy was found to correspond in composition approximately with that at the turning point of the electric conducting power curve.

Tenacity. When wires of the same diameter of metals and alloys are broken by traction, those of the alloys will require a much greater force than their component metals; and it may be deduced from what is known, that those alloys the composition of which corresponds to the turning point of the conducting power curve are more tenacious than any other alloy composed of the same metals.

Elasticity. When spirals of wires of metals and their alloys are weighted to an equal extent, the alloys will be found on removing the weights to possess the property of resuming their original form in a much higher degree than their component metals. Here

again the alloys corresponding in composition to those of the turning point of the conducting power curves are the most elastic.

From what has been said, and from the experiments described, the conclusion may be drawn that the chemical composition of the practically-used two metal alloys correspond to those situated at the turning points of the heat and electric conducting power curves, and that if a two-metal alloy of a special physical property be required, it would be as well to try that alloy, the composition of which would correspond to the turning point of the curve representing the electric conducting power of the alloys of the two metals.

THE RIGHTS OF MEDICAL PRACTITIONERS.

The meeting of the Executive Committee of the General Medical Council, held on Wednesday, February 10, was merely of a formal character, mainly for the purpose of auditing accounts, and authorizing the publication of the medical and student registers. The opinion of the Council was also formally submitted to the Committee, to the effect that the Medical Act suffices to preserve those rights of medical practitioners which were supposed to be interfered with by the Pharmacy Act. All the counsel consulted concur in the view that the latter cannot override the Medical Act.—*Lancet, Feb.* 13.

PROPOSED INVITATION TO THE BRITISH PHARMACEUTICAL CONFERENCE.

A meeting of the Chemists of Torquay took place on Thursday evening, Feb. 4, at the Victoria Club, to consider a proposal to invite the members of the British Pharmaceutical Conference, visiting Exeter in August next, in conjunction with the British Association, to pay a visit to Torquay for a day; and to decide upon the means to carry out the project in a manner becoming the dignity of the pharmaceutical profession in Torqnay.

Mr. W. Hearder was unanimously voted to the chair, and succinctly explained the objects of the meeting.

Messrs. Guyer, Smith, Narracott and Millar having addressed the meeting, and expressed their warm approval of its object, the following resolution was carried:—"That this meeting considers it desirable that an invitation be sent to the Executive Committee of the Pharmaceutical Conference, and members from a distance, to visit Torquay during the meeting of the Conference at Exeter in August next."

It was also proposed and resolved,—"That the Chemists of Paignton and St. Mary-Church be invited to unite with those of Torquay in carrying out the objects of this meeting."

The following gentlemen were chosen as a committee, with power to add to their number:—Mr. W. Hearder, Treasurer; Mr. D. Watson, Secretary; Mr. Guyer, Mr. Smith, Mr. Glanfield, Mr. Millar, Mr. Narracott.

A subscription list having been opened and liberally responded to, the Chairman expressed the pleasure it had afforded him to preside over a meeting characterized by such a mutual feeling of goodwill, and his trust that the same friendly feeling would always animate them in their intercourse with each other.

The meeting then separated.

MISCELLANEA.

Spontaneous Ignition of Fireworks.—Mr. R. Trevor Clarke, in a communication to the 'Times' on the frequency of fires in pyrotechnical manufactories, which he thinks may, in many cases, be attributed to the spontaneous combustion of that class of fireworks called coloured fires. He observes,—"That these compositions, the active agent in which is chlorate of potash, occasionally 'go off of themselves,' has long been known, but, I believe, no definite information on a subject so important has ever been laid before the public. Herewith I send you what I know of my own knowledge in the matter:—Firstly, mixtures of chlorate of potash, sulphur, and black oxide

of copper are almost certain to ignite sooner or later, at uncertain periods, after mixing, and without premonitory phenomena. Secondly, mixtures of chlorate of potash, sulphur, and nitrate of strontian, in quantities larger than about an ounce, will frequently take fire within a few hours after they are made. When nitrate of baryta is substituted for strontia, the liability is nearly as great. When sulphuret of antimony or charcoal is added, the liability is greatly lessened, but probably not entirely done away with. Thirdly, when any of these compositions have become damp and ineffective from the deliquescent nature of the salts employed, and are submitted to too much heat for the purpose of drying them, they will suffer a peculiar and sudden decomposition, followed by actual ignition. In the second case mentioned, decomposition is manifested by the evolution of an orange-coloured gas, which hangs as a cloud or vapour over the compound. If the desiccation of the salts has been thoroughly effected prior to mixing, and the atmosphere should be in a damp state from weather or any other cause, the mixture, unless at once secured from moisture, will often ignite in an hour from the making. In the third case, as soon as the temperature rises to a certain height, the mass begins to hiss and bubble, suffering a kind of fusion, accompanied with the production of the gas or vapour before alluded to. Of the nature of this vapour, which smells both of chlorine and nitric oxide, I am ignorant. The action is probably catalytic, and induced by the energetic absorption of moisture from the air. Our chemists could do no better service to the community than by investigating this matter thoroughly."

Strong Doses of Camphor.—A case illustrating the danger of strong doses of camphor is recorded in the 'Lancet' of January 9, as having been brought before the Société de Médecine et de Pharmacie de Grenoble. An enema consisting of five grammes of camphor dissolved in the yolk of an egg was given to a child three years of age, suffering from typhoid fever. Symptoms of poisoning soon manifested themselves, convulsions, lividity of the countenance, stupor, arrest of the urinary secretion, etc. The employment of coffee sufficed to restore the child.

Dear Drugs.—An earnest effort will be made to include in the amendments to the tariff bill a large reduction of the duty now imposed on many foreign drugs and medicines in daily and common use by the American people, articles which do not come in competition with any of our domestic products, inasmuch as they are not the growth or production of our own country. In some instances this duty amounts to more than 150 per cent.—*New York Times*, Jan. 28.

Dichroic Ink.—A new ink, under the above name, has been brought out by Messrs. Bewley and Draper, of Dublin. It is said to consist of a strong solution of logwood; it has no sediment, and being free from acid, does not corrode the pen; it sinks rapidly into the paper, and soon becomes black.

Death from Chloroform Self-administered.—On Thursday, Dec. 10th, Mr. W. Carter held an inquest at the Horse and Groom tavern, Walworth Road, touching the death of Mr. A. John Roberts, aged thirty-one years. Mr. John Jones, assistant to Messrs. Faulkner and Steadman, chemists, of 241, Walworth Road, said that on Sunday last the deceased returned home. He was manager to the firm. He went up to bed. Shortly afterwards he was found dead. He was in high spirits when he retired to rest. He had been in the habit of using chloroform for the purpose of deadening pains in the face. Mr. Chrisp, surgeon, said the deceased was his nephew. When he was called in, he found him lying with his face on the pillow. There was a silk handkerchief in his right hand. Near the body was an empty phial, which had contained chloroform. The *post-mortem* examination of the body proved that death had resulted from the inhalation of chloroform. The jury returned a verdict "that the deceased killed himself by misadventure."

Tincture of Iodine with Carbolic Acid.—In the 'Lancet' of Dec. 12th, it is stated, on the authority of Dr. Bogs, of the Indian service, that by the addition of a few drops of chloroform to tincture of iodine, the latter will not stain when required as an injection. The following proportions are given:—

Tincture of Iodine	45 drops.
Pure Carbolic Acid . . .	6 drops.
Glycerine	1 oz.
Distilled Water	5 oz.

Production of an Alkaloid during the Alcoholic Fermentation. By M. Oser.—In fermenting sugar with washed yeast M. Oser obtained, besides alcohol, an alkaloid to which he attributes the formula $C_{26}H_{20}N_4$. The chlorohydrate of this alkaloid crystallizes in hygroscopic scales, becomes brown in the air, and possesses a pungent bitter taste. The author is assured that this alkaloid does not pre-exist in the yeast, but that it is formed during the fermentation. Attention has already been directed to the presence of trimethylamin in wine (see page 333).—*Journ. Prakt. Chem., and American Journal of Pharmacy.*

Naphthaline to Repel Insects.—M. Eugène Pelouse proposes to employ naphthaline to protect plants from insects. It does not act as an insecticide, but is so disagreeable to them as to cause them to leave a plant upon which it is sprinkled. It is used in very small quantities, and said to be very effectual.—*Journ. de Chim. Méd., and Amer. Journ. Pharm.*

Suicide by "Vermin Powder."—An inquest was held at Leytonstone Road, Stratford, on Monday, November 9th, on the body of Miss Clara Jeffs, aged 22. On the previous Monday the sister of the deceased, on hearing cries, went upstairs, and found the deceased lying on the bed insensible. Medical aid was obtained, but death took place shortly afterwards; previously she admitted having taken "Vermin Powder." The paper that had contained the powder was found in the room. The deceased had had an attack of brain fever two years ago, and had been very desponding since. An analysis of the contents of the stomach was made by Dr. Tidy, who detected the presence of strychnine, which, in his opinion, was the cause of death. The jury returned a verdict in accordance with these facts.

Obituary.

On the 13th of February, at Chelmsford, aged forty years, Alfred Rowley Pertwee, chemist.

REVIEW.

The Law to regulate the Sale of Poisons within Great Britain. By William Flux, Attorney-at-Law, Solicitor to the Pharmaceutical Society of Great Britain, etc. John Churchill and Sons, New Burlington Street.

At a time when every chemist and druggist in Great Britain, and many other persons also, are anxious to master the difficulties of the new Pharmacy Act, to the provisions of which they will hereafter be subject, this digest will be most acceptable. The author, in a very short preface, explains that he has endeavoured to place in convenient arrangement the leading passages of the statutes regulating the sale of poisons, and in doing so has, as far as possible, used the precise language of the statutes themselves in preference to words of his own. This introduction might lead the reader to infer that the book will be nothing more than a reprint of the Act. The advantage however is, that it is something *less*. In the Act itself different things are included in the same prohibitory clauses. In the work before us they are divided. Thus in Chapter IV. entitled, "Who may Sell Poisons," the first clause of the Act is made perfectly intelligible by printing it without those words respecting the improper assumption of titles, etc., which are irrelevant to "Who may sell." By this condensation Parliamentary language becomes clear. But it must not be supposed that the improper assumption of titles is overlooked. That question receives similar treatment by itself in Chapter VI. Each subject, being treated as it were "without incumbrances," becomes plain to the uninitiated in legal phraseology. A simple table of contents at the commencement, and a most copious "Index" at the end of the book, guide each man to the solution of his own doubt or difficulty.

Mr. Flux has wisely embodied the "Arsenic Act," and certain parts of the Adulteration of Food Act in his book, both being alluded to in the new Pharmacy Act.

BOOKS RECEIVED.

LECTURES ON THE PRESERVATION OF HEALTH. By CHARLES A. CAMERON, Ph.D., M.D., etc. Illustrated with woodcuts. London and New York: Cassell, Petter, and Galpin. 1868.

THE LAW TO REGULATE THE SALE OF POISONS WITHIN GREAT BRITAIN. By WILLIAM FLUX, Barrister-at-Law, etc. London: John Churchill and Sons, New Burlington Street. 1869.

PHARMACOPŒIA OF THE ROYAL HOSPITAL FOR DISEASES OF THE CHEST. London: John Churchill and Son, New Burlington Street. 1869.

TO CORRESPONDENTS.

Persons having seceded from the Society may be restored to their former status on payment of arrears of subscription and the registration fee of the current year.

Those who were Associates before the 1st of July, 1842, are privileged (as Founders of the Society) to become Members, and by virtue of membership to be registered as *Pharmaceutical Chemists*.

The Secretary and Registrar desires to intimate that no anonymous communications, or letters signed with initials only, will be answered.

The Modified Examination.—Mr. Waite, of Scarborough, writes as follows:—"Having recently passed the 'Modified,' would you kindly allow me, through the medium of your widely-circulated Journal, to offer a word of advice to my brother 'chips' intending to pass that examination. In the first place, do not be misled by those who state it to be a 'mere bagatelle.' Get up as thoroughly as you can the different branches mentioned in the synopsis, and, if practicable, spend at least a week in daily attendance at the library and museum of the Society. You will then find it comparatively easy; but if you come up the day before with an idea it is nothing, and without that preparation, you will probably be numbered with those (of whom there is more than one West-End assistant) who, in failing, have only to blame their own carelessness. From the Society you will receive every assistance, the use of their magnificent library and museum, and a kind and valuable aid from your fellow-students, as well as those who are striving to place themselves on a still higher footing as Pharmaceutical Chemists, which will remove for ever that spirit of antagonism, I am ashamed to say, so many of us have hitherto felt to the Society, stimulate you to further and higher effort, and leave a grateful remembrance of all connected with the Pharmaceutical Society of Great Britain."

Mr. George Manby (Southampton) wishes to give the following caution to the trade —"As so much has been and is now being done to somewhat improve the state of pharmacy, I think that it would be well to inform certain members (through your Journal) that they are not adding to its respectability by furnishing *patent medicines*, such as Steedman's powders, Fenning's powders, Cockle's pills, etc. etc., to small shopkeepers, or rather *hucksters*, for them to supply to their customers *in single doses*. Two or three instances have been brought to my knowledge, and on inquiry, I find it is done in this town to some extent (of course curtailing considerably the legitimate business of the chemist). I have ascertained at the Inland Revenue Office that this practice is strictly illegal; the Patent Medicine Act clearly states that 'no person can retail these medicines unless they pay the licence.'"

The Use of Ammonia in Hydrophobia.—Mr. J. Silvester (Knutsford), referring to the use of ammonia in India in cases of snake-bites, relates the following case:—About thirty years ago, a rabid dog passed through this neighbourhood; a farmer, who had a cow bitten severely on the nozzle, applied to me for a remedy, but, as I knew of

none, I refused to interfere; but finding that he would take no denial, and that no means had yet been used though twenty-four hours had elapsed, I gave him 8 oz. of liquor ammoniæ, half the P. L. strength, and a piece of lunar caustic, with directions to have the bitten part cut out immediately, and to apply the ammonia to the wound and afterwards the caustic, and then to give two tablespoonfuls of the ammonia in cold water three times a day as long as it lasted. Considering the cure barely possible, I thought little more about it; but to my surprise, about ten years after, the farmer called and assured me the cow was perfectly healthy. Several animals bitten by the same dog had to be destroyed.

Q. S. O. (Oxford).—(1.) *Citrate of Magnesia:* a formula will be found in the 'Pharmaceutical Journal,' Vol. VII. p. 17. (2.) *Sergeant's American Coffee-pot:* we do not know where it is sold. (3.) You should apply to Mr. Condy.

T. H. B. (Leicester).—Liable to the Patent Medicine Stamp,

J. S. S. and several other Correspondents.—The new edition of Bentley's 'Manual of Botany' is in the press, and may be expected in April. A new edition of Pereira's 'Manual of Materia Medica and Therapeutics' is in course of preparation. We hear of no new edition of the other work mentioned.

George Wilson (Greenock).—The specimen forwarded is probably a species of *Aristolochia*, but we can give no positive information respecting it.

"*Socius*" (Egremont).—Cusparin may be prepared from an alcoholic tincture of the bark by spontaneous evaporation.

A. B. should apply by letter to the Secretary, 17, Bloomsbury Square, who will give the information sought.

"*A Correspondent*" (Walsall) wishes to give a caution as to the danger of the so-called "Harmless Coloured Fires." Having lately received one dozen tins of these "Fires" from a wholesale house, he was aroused one night by the police, and found the shop on fire. Fortunately, it was soon put out. On examination, it was found that several of the tins had burst and spontaneously ignited.

"*A Student.*"—The apparatus for spectrum analysis described in the Pharmaceutical Journal, Vol. III. (N. S.), page 426, by Mr. Alexander Waugh, may be constructed by any tinman, from the drawings. We know that Mr. Waugh would be happy to afford any information on the subject to our correspondent.

W. A. C. (Bakewell).—(1.) Probably a weak solution of chlorine would answer the purpose. (2.) The tincture of galls.

T. R. M. (Manchester) wishes for a formula for "Fluid Extract of Sarsaparilla with Quinine."

C. W. R. (Horbury).—Linseed oil.

"*Anxious*" (Wigan).—The "Minor Examination" would be sufficient.

Communications are acknowledged from Mr. C. H. Southwell, Mr. Sumner, Mr. Joseph Brough, and Mr. Hosking.

J. L. (Swansea).—(1.) *Sale of Quinine Wine:* see Vol. IX. (N.S.) p. 212. (2.) The sale of "Grains of Paradise" to brewers is illegal.

X. Y. Z. (Cambridge).—(1.) Poisons mentioned in the Schedule to the Pharmacy Act cannot be sold by unregistered persons. (2.) No.

G. W. (Stony Stratford).—(1.) Yes. (2.) In April.

S. V.—*Ten ounces.*

D. D. (St. John's Wood Terrace).—It is probable that benzole is intended, but it would be well to inquire of the prescriber.

E. H. (Idle).—The question is answered at page 499.

Instructions from Members and Associates respecting the transmission of the Journal before the 25th of the month, to Elias Bremridge, Secretary, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Messrs. Churchill, New Burlington Street. Other communications to the Editors, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. X.—No. X.—APRIL, 1869.

REGULATIONS FOR THE SALE OF POISONS.

The difficulties that have been experienced in construing the provisions of the Act for regulating the sale of poisons are, to a great extent, removed by the opinion obtained from the Privy Council, which will be found elsewhere in the present number of this Journal. The "Case" prepared by the solicitors comprehends the most important points requiring elucidation, and respecting which a liberal interpretation of the Act seemed to be that most likely to conduce to the safety of the public. The reply, we think, is all that could be expected, and as far as it goes, is quite satisfactory. It assumes that the Legislature, in passing "An Act to Regulate the Sale of Poisons," contemplated the application of the regulations imposed by the Act to *poisonous substances*, and that it was not intended that the same regulations should be applied to non-poisonous substances. This is the common-sense view of the subject, and the explicit manner in which it is expressed by Mr. Simon, on behalf of the Privy Council, will tend to clear away the only serious difficulty that has been apprehended with reference to this part of the operation of the law.

It must not be supposed, however, that the satisfactory settlement of the principal question on which the opinion of the Privy Council was asked, will relieve Chemists and Druggists from much responsibility and the exercise of judgment in determining which among the substances referred to are to be dealt with as scheduled poisons. It appears the Privy Council "are advised that it is not feasible to define the precise proportion of poison in any preparation which may bring it within the Act;" it is therefore left to the seller to determine this point on his own responsibility. "My Lords," Mr. Simon says, "apprehend that questions of fact must be dealt with as they arise; for it is possible to take so much of a compound, perfectly harmless if taken in reasonable quantities (*e. g.* carbonate of soda), as to destroy life, and it is possible that a particular paregoric lozenge might contain a deadly amount of poison; but it seems to their Lordships that, for general purposes, and as matter of legal interpretation, these extreme and barely supposable cases may be disregarded, and that the Pharmaceutical Society may safely act upon the test given above."

It is a great relief to find that an arbitrary rule that, strictly interpreted, would have included many innocuous substances in the category of poisons, is not to be applied in that sense; but it still remains to be determined whether any, and if any, then what rule should be adopted for indicating which of the preparations included in the schedule are to be considered poisons and dealt with as such. It is very desirable that as much uniformity as possible should be

observed among chemists in distinguishing between preparations of scheduled poisons to which the provisions of the Act are, and those to which they are not, to be applied.

We presume the statement in Mr. Simon's communication, to the effect that it is not feasible to define the proportion of poison in any preparation that would bring it within the meaning of the Act, refers to a judicial decision founded on such a distinction, and would not apply to a rule adopted for the guidance of persons similarly occupied, and among whom it is desirable to establish uniformity of practice in selling or dispensing such preparations. It has been suggested, with reference to preparations of opium, that any preparation containing one part or more of opium per cent., but not otherwise, should be considered to come within the meaning of the Act. This would exclude paregoric, while it would bring laudanum, extractum opii liquidum, or Battley's solution, and vinum opii, under the Act, as well as the pills, powders, and confection of the Pharmacopœia; but it has been thought that pills and powders, and also the confection, when divided in separate doses, need not be subject to the same regulations. But whatever rule of this description it may be thought possible and desirable to adopt, must be applied subject to the exercise of a sound discretion, the spirit of the law being carefully observed, and the safety of the public provided for in the most efficient manner.

It must never be forgotten, while studying to carry the Pharmacy Act of 1868 into effect, that this law relates to only a small part of the duties which devolve upon the chemist and druggist, and that it does not in any way relieve him from the obligation to do all that lies in his power to prevent the use of poisonous substances for unlawful purposes, and to establish regulations by which, in the legitimate use of such substances, accidents resulting from ignorance or carelessness may, as far as possible, be prevented. It is left to those whose knowledge and experience enable them to do so, to devise and introduce means, beyond those specified in the Act, for accomplishing this object not only with regard to scheduled poisons, but also with regard to all other poisonous or dangerous substances. Among the arrangements now generally made in well-regulated establishments is one for separating the most active poisons from less dangerous medicines which are in more frequent use, and for distinguishing the one class from the other by some peculiarity in the methods of keeping or labelling them.

These and other arrangements, for effecting the same general object, claim the serious attention of those to whom the Legislature has intrusted the responsible duty of guarding the public interests in the sale and use of poisons. The liberal spirit in which the Government has met the application from the Council of the Pharmaceutical Society, should stimulate the members of the Society, and Chemists and Druggists generally, while observing all that the law requires, to endeavour, at the same time, to carry into effect the spirit of the law, by the adoption of the most efficient means that can be devised for that purpose.

CONFIRMATION OF THE BYE-LAWS.

We are now enabled to state that the new Bye-laws of the Pharmaceutical Society, adjusted to suit the altered condition of the Society under the "Pharmacy Act of 1868," have been duly approved and confirmed by the Privy Council. The impediment which existed in the way of electing Registered Che-

mists and Druggists, as Members of the Pharmaceutical Society, under clauses 2 and 4 of section 1 of the Bye-laws, is thus removed, and the Council, at their last meeting, at once proceeded to exercise the power now given them, by electing 124 Members from the class of Registered Chemists. There are now about eighty applications for election waiting to be submitted to the Council.

PHARMACY ACT AMENDMENT BILL.

The Bill to amend the "Pharmacy Act, 1868," brought in by Lord Robert Montagu, has not yet proceeded beyond a first reading. It has been on the paper of the House of Commons for second reading on several nights, but is still deferred, and now stands for the 5th of April.

The object of this Bill is simply to reserve the rights of medical practitioners and veterinary surgeons in Scotland; the former have no qualification from Apothecaries' Hall, and the latter are not members of the Royal College of Veterinary Surgeons of Great Britain.

The opinion of legal authorities both in England and Scotland affirm that legally-qualified medical practitioners are not affected by the "Pharmacy Act, 1868;" it was not intended by the promoters of the Act that they should be, therefore there can be no objection, beyond the question of surplusage, to the passing of the amendment. If necessary, however, for Scotland, it is also required for England, and should be worded accordingly.

The introduction of this Bill gives the Pharmaceutical Society the opportunity of moving for the erasure of the word "immediately" in the certificates to be produced by Assistants, entitled under section 4, to be registered as Chemists and Druggists.

THE PETROLEUM ACT.

In our last number we alluded to the application made at the Home Office by representatives of the Pharmaceutical Society, together with Mr. Thomas, the proprietor of Benzine Collas, and Mr. Sanger, of Oxford Street, on this subject. We have much satisfaction in being now enabled to state that the representations, which have been made to the Home Secretary, showing the hardships that would be inflicted by the operation of the Petroleum Act, if strictly carried into effect, have resulted in a promise that the objectionable provisions of the Act shall be speedily amended by a short Bill, to be introduced for that purpose. A letter from Mr. Liddell, the Under-Secretary of State, addressed to Mr. Thomas, will be found at p. 590.

We understand the Bill referred to by Mr. Liddell will enable Chemists to keep benzine and other products of coal or petroleum in small quantities in their shops, either for use in dispensing or put up for sale as scouring-drops, and in larger quantities in their store-rooms, without taking out a licence.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *March 3rd*, 1869,

Present—Messrs. Bottle, Bourdas, Brady, Carteighe, Deane, Evans, Haselden, Hills, Ince, Orridge, Mackay, Morson, Randall, Sandford, Savage, Squire, Standring, Stoddart, and Williams,

The following Pharmaceutical Chemists were elected

MEMBERS.

Ball, George Stephen, Weston-super-Mare.
Bateman, Thomas Henry, London.
Bayley, Joseph Thomas, Brownhills.
Cumming, Charles, Edinburgh.
Fisher, John James, Carlisle.
Hitchcock, Charles Garrad, Oxford.
Johnson, Frederick, Henley-in-Arden.
Johnson, Samuel E., Ashby-de-la-Zouch.
Matthew, William Ham, Saltash.
Rayson, Henry, Wanstead.

The following, having paid their arrears and their subscriptions for the current year, were restored to Membership:—

Betty, Samuel C., London.
Cock, John, Shipdham.
Farie, Gilbert, Bridge of Allan.
Muskett, Charles, Diss.
Wootton, William, London.

The following letter from the Privy Council was read:—

Medical Department of the Privy Council Office,
6th February, 1869.

BYE-LAWS.

Sir,—In answer to your letter of the 20th ult., enclosing certified copy of the Bye-laws proposed by the Pharmaceutical Society for the confirmation and approval of the Lords of Her Majesty's Council, I am now directed by their Lordships to inform you that they confirm and approve the said Bye-laws.

I am, Sir, your obedient servant,
JOHN SIMON.

The Secretary to the Pharmaceutical Society, etc.

The following Chemists and Druggists, registered under the "Pharmacy Act, 1868," were elected

MEMBERS.

TOWN.	CHRISTIAN & SURNAME.
Ashby-de-la-Zouch	Matthews, Charles.
Bala	Jones, Thomas.
Banff	Ellis, Bartlet.
Basingstoke	Sapp, Arkas.
Bath	Anstey, John Upham.
Birmingham	Gray, Wm. J. S.
,,	Snape, John George.
Blackburn	Pickop, James D.
Blackpool	Harrison, Joseph.
Blakeney	Philpotts, Joseph.
Brighton	Akehurst, Arthur F.
,,	Schweitzer, Julius.
Carnarvon	Williams, Edmund.
Chester	Shepheard, Thomas.
Clifton, Bristol	Harding, H. Edwin.
Croydon	Stannard, F. John.
Doncaster	Atkinson, George J.
Dorchester	Evans, Alfred John.
Dover	Forster, Robt. Henry.
Downton	Fleming, John Thomas.
Dudley	Gare, Charles Hazard.
Edinburgh	Brown, Robert Smith.
,,	Mackenzie, James.
Eltham	Mellin, Charles J.
Epping	Hipsey, John Wm.
Exeter	Broom, William.
,,	Dowling, Robert.
Fareham	Batchelor, C. J. H.
Faringdon	Ballard, Arthur.
Gainsborough	Spouncer, Henry T.
Gravesend	Parrett, Edward.
Harrow-on-the-Hill	Gunn, Samuel John.

TOWN.	CHRISTIAN & SURNAME.
Hastings	Miller, Frederic.
„	Rossiter, Frederick.
Havant	Chignell, Alfred.
Hay	Hadley, Benjamin.
Hereford	Stephens, George W.
Hitchin	Elliott, Robert John.
Hull	Bell, Charles B.
„	Gibson, Charles P.
Ilkley	Usher, Robert.
Iron Bridge	Hartshorn, Arthur F.
Kettering	Thursfield, John F.
Kidderminster	Howitt, George.
Kirton-in-Lindsey	Penn, George.
Knutsford	Jackson, Peter H.
„	Jackson, William.
Lincoln	Maltby, Joseph.
Liverpool	Evans, William.
„	Parkinson, Richard.
„	Simcock, Wm. H.
„	Strawson, Vincent.
Llangefni	Griffith, John Edwards.
Longton	Prince, Arthur George.
Lymington	Corbin, Dennett G.
Lymm	Evans, Isaac Henry.
Manchester	Macminn, James.
Middlesboro'-on-Tees	Middleton, Joseph.
Mossley	Jones, Henry.
Newbury	Davis, Frank Pratt.
Newnham	Philpotts, James R.
Newport, I. of Wight	Orchard, Herbert J.
Norwood, Upper	Izod, James.
Oldbury	Allsop, John.
Oxford	Thurland, Henry.
Penge	Bennett, Thomas.
Peterborough	Willson, Stephen.
Petersfield	Edgler, Wm. Bicknell.
Plymouth	Clark, Robert John.
„	Hearder, Henry P.
„	Marsh, John.
Portree	Mitchell, Alexander.
Preston	Daggers, Frederick.
Rochdale	Taylor, E. Bamford.
Rye	Smith, Alfred Wm.
Saffron Walden	Burch, Robert.
Salisbury	Orchard, Edwin John.
Scarborough	Smart, John.
Shepton Mallet	Cottrell, Gilbert J.
Sleaford	Wigglesworth, T. W.
„	Weston, George.
Southborough	Panes, George.
Sydenham	Lang, William.
Tamworth	Chatterton, John.
Truro	Percy, Thomas Bickle.
Tunbridge Wells	Cheverton, George.
Ulveston	Downward, John.
Welchpool	Jones, Thomas Pugh.
Wellingborough	Sarjeant, John Wm.
Woburn	Clarke, George B.
Worcester	Morris, John.
Yarmouth	Bell, William.

LONDON.

Bastin, Edward, Stoke Newington.
Beere, Louis Edward, Blackwall.
Biffin, Thomas, 10, Herne Terrace, Dulwich Road, Herne Hill, Surrey.
Brightmore, Walter, Maida Vale.
Burton, J., 6, Portsdown Ter., Kilburn Gate.
Clapp, Edward Francis, Stoke Newington.
Fitch, Robert Owen, South Hackney.
Foulger, Samuel, 133, St. George St. East.
Froom, Wm. Henry, 75, Aldersgate Street.
Fuller, R. T. C., 221, Union St., Borough.
Gadd, Robert, 1, Harleyford Rd., Vauxhall.
Gadd, Henry, 7, Cambridge Terrace, High Street, Kingsland.
Gaunt, R. D. H., 221, Union St., Borough.
Golding, R. L., 172, Albany St., Regent's Pk.
Jones, Thos. Charles, 12, Chalk Farm Rd.
Keeling, J. C., Amherst Rd. East, Hackney
Messer, Frederic, 300, High Holborn.
Newby, Richard Irving, Castlenau, Barnes.
Owen, O. Davies, 69, Coleman St., E.C.
Pass, H., 11, Spring Ter., Wandsworth Rd.
Pinyon, Wm., 23, Bayswater Terrace, W.
Smith, W., 2, Alfred Ter., South Hackney.
Sparrow, W. C. F., 2, Ranelagh Ter., Pimlico.
Stacey, Samuel Lloyd, 300, High Holborn.
Taplin, Wm. Gilbert, 75, Hampstead Road.
Tipping, T. J. W., High St., Stoke Newington.
Tomlinson, Thos., 6, Lower Seymour Street, Portman Square.
Wellspring, John, 3, Chandos St., Strand.
Whincup, W., 404, Essex Rd., Islington, N.
Whittle, Elias C. C., Townshend Road, St. John's Wood.

Other applications were deferred until the next meeting of the Council.

SALE OF POISONS.

"CASE" RAISING POINTS SUBMITTED TO THE PRIVY COUNCIL BY THE COUNCIL OF THE PHARMACEUTICAL SOCIETY FOR LEGAL ADVICE AND OPINION.

There is difficulty in the construction of the Pharmacy Act, 1868, upon those items in the Schedule A which are as follows:—

In Part I. Arsenic and its preparations.
Aconite and its preparations.
Ergot of Rye and its preparations.
In Part II. Belladonna and its preparations.
Opium and all preparations of opium or of poppies.

Other poisons appear in each part of the schedule without special reference to their preparations; they are—

Prussic Acid.
Cyanide of Potassium and all metallic cyanides.
Strychnine and all poisonous vegetable alkaloids, and their salts.
Emetic Tartar.
Corrosive Sublimate.
Savin and its oil.
Oxalic Acid.
Cantharides.
Essential Oil of Almonds.

Some of the last-mentioned poisons form compounds, and are ingredients in articles in common use, called by proper names; as, for instance, tartar emetic is an ingredient in an article called antimonial wine.

Section 2 of the Act contains a power under which articles not enumerated in the schedule may be made "poisons" within the meaning of the Act, so that, whether preparations of prussic acid and other poisons scheduled in like manner, are in strictness poisons within the meaning of the statute or not, there is clear power for making them so by a course of action on the part of the Privy Council and the Pharmaceutical Society; but the statute does not contain any provision for the converse of the case, and therein lies the difficulty. There is an absence of any power under which any authority under Parliament can declare that an article, being a preparation of arsenic, or aconite, or ergot of rye, or belladonna, or of opium, or of poppies, is not a poison within the meaning of the Act; and it is, therefore, material clearly to ascertain the meaning of the statutory word "preparations," as used in the schedule.

Opium presents an illustrative or test case. The British Pharmacopœia is a publication issued under the authority of the Medical Act, and is particularly referred to in section 15 of (but not elsewhere in) the Pharmacy Act, 1868. The reference in section 15 is as follows:—"Any person . . . who shall compound any medicines of the British Pharmacopœia excepting according to the formularies of the said Pharmacopœia shall, for every such offence, be liable to pay a penalty or sum of £5."

The British Pharmacopœia contains a heading "Opium," and under it certain directions, then a description of the article and its dose, and then a sub-heading, "Preparations," under which there is a long list, from which the following may be selected:—"Tinctura Camphoræ Composita, 2 grains to 1 fluid ounce;" "Tinctura Opii, 33 grains to 1 fluid ounce."

2 grains to 1 fluid ounce is practically the proportion of 1 in 240; 33 grains to 1 fluid ounce is the proportion of 1 to 14.

In another part of the British Pharmacopœia (and in its order) there appears a distinct heading "Tinctura Camphoræ Composita—Compound Tincture of Camphor," and a statement of the ingredients of which it is to be composed, showing opium in the above-stated proportion of 1 in 240. Also in another part of the same book (and in its order) there appears another distinct heading "Tinctura Opii—Tincture of Opium," and a statement of the ingredients, showing opium in the proportion above stated of 1 in 14.

Thus, although tinctura camphoræ composita and tinctura opii are in the list of pre-

parations, under the heading opium, elsewhere in the same Pharmacopœia, the one is described by a name in which opium does not form part, and the other is described as tincture of opium.

The British Pharmacopœia has been thus referred to as speaking with a weight of authority, but it should be noticed that to accept it as conclusive may lead to error, since the compilers of the Pharmacopœia may, and in practice do, make alterations therein, and it clearly was not the intention of Parliament to give the compilers of the Pharmacopœia authority to change the status of an article, and thus expand or contract the list of Poisons.

The Pharmacy Act, 1868, is open to the observation that it comprises two classes of provisions,—the one class in restraint of trade by imposing penalties on the sale of poisons, by persons not registered under the Act, and thus, according to the rules of construction, to be construed *strictissimus* against the registered persons. The other class enacting penalties on sales of poisons by the registered persons, if not made in accordance with certain prescribed formalities, and according to the usual rules of construction, to be construed *strictissimus* in favour of the same registered persons. So far as the Act creates a monopoly, it may, *primâ facie*, appear to the interest of registered persons that the widest construction shall be put upon the word preparations, but as a matter of convenience in the conduct of sales of poisons, and practically in the general interest of the registered persons and the public, it is most undesirable that a very extended meaning shall be given to the words "poison" and "preparations;" moreover, public safety will, in all probability, be best secured by a limited construction of the words.

A class of cases at common law have been decided upon the general question how far articles in merchandise maintain or change their mercantile descriptions, as, for instance, how long grain remains properly described as wheat, notwithstanding the presence of proportions of grain not wheat. The class of cases may aid in the considerations above suggested, say on the question, whether, when an article such as compound tincture of camphor contains, as an ingredient, a very small proportion of opium, it is for all the purposes of the Act (if for any it must be for all) a preparation of opium.

Compound tincture of camphor is commonly called Paregoric ; it is a useful popular medicine for coughs, and for the statutory requirements respecting poisons to be complied with on sales of paregoric, would not only be prejudicial as alarming patients about taking a useful simple medicine, but would go far to destroy the value of the word "poison" through too common use; applying the word poison to this and some other harmless preparations, which cannot correctly be deemed poisons at all, according to the common acceptation of the term, would naturally lead the public to regard the poison label as a mere formality.

If it can be relied upon that a limited construction will be put upon the words "poison" and "preparations," it will be practicable to work the statute without further Parliamentary powers, because the case illustrated by strychnine can be covered by the exercise of the statutory powers created by Section 2, under which the Privy Council and the Pharmaceutical Society can declare that compositions containing any given proportions of Strychnine shall be deemed poisons within the meaning of the statute.

In stating the foregoing, the endeavour has been to disclose the difficulty and raise the points with a view to suggestions under the authority of the Privy Council to the Pharmaceutical Society if such can be given.

Reply.

Medical Department of the Privy Council Office,
6th March, 1869.

The Secretary of the Pharmaceutical Society, 17, Bloomsbury Square, W.C.

Sir,—I have laid before the Lords of Her Majesty's Council the statement prepared for that purpose by the Solicitors of the Pharmaceutical Society, and put into my hands by the President of the Society, on the subject of a difficulty which the Society feels in applying the language of the Pharmacy Act, and particularly of its Schedule A, to the case of such pharmaceutical compounds as contain some scheduled "poison" in extremely small and practically non-poisonous quantity.

My Lords, having given their best consideration to the subject, are of opinion that the "preparation" of a poison in the Pharmacy Act, 1868, means a compound which, like the poison of which it is a preparation, is in itself deadly or dangerous, and that it does not mean a compound which is in itself perfectly harmless, although into its composition may enter a poison, or the preparation of a poison, which taken alone would be dangerous or deadly. My Lords apprehend that questions of fact must be dealt with as they arise; for it is possible to take so much of a compound perfectly harmless if taken in reasonable quantities (*e. g.* carbonate of soda), as to destroy life, and it is possible that a particular paregoric lozenge might contain a deadly amount of poison; but it seems to their Lordships that, for general purposes, and as matter of legal interpretation, these extreme and barely supposable cases may be disregarded, and that the Pharmaceutical Society may safely act upon the test given above.

My Lords, however, are advised that it is not feasible to define the precise proportion of poison in any preparation which may bring it within the Act.

I am, Sir, your obedient servant,

JOHN SIMON.

EXAMINATIONS IN LONDON.

February 24th, 1869.

Present—Messrs. Bird, Carteighe, Davenport, Deane, Gale, Garle, Haselden, and Morson.

Four candidates presented themselves for Examination; the following three passed, and were duly registered as

PHARMACEUTICAL CHEMISTS.

Abbott, James, Leeds. Baxter, George, Worksop. Roberts, John Lyddon, Leeds.

February 26th, 1869.

Present—Messrs. Bird, Carteighe, Cracknell, Darby, Davenport, Deane, Edwards, Evans, Gale, Garle, Haselden, and Southall.

MODIFIED EXAMINATION.

Forty-nine candidates presented themselves; the following thirty-three passed, and were duly registered as

CHEMISTS AND DRUGGISTS.

Adams, Edmund Tapley, St. Mary Church.
Ashburner, John Pearson, Ulverstone.
Beer, James Henry Elias, London.
Bennett, Joseph, Bristol.
Bogle, Robert, Radcliffe.
Brereton, Matthew Bayfield, Putney.
Brook, Edward, Liverpool.
Bullock, Frederick, Manchester.
Crewdson, Matthew, Ulverstone.
Crocker, George, Weston-super-Mare.
Davies, John, Torquay.
Eyre, Sidney, Sheffield.
Giles, John James, Ashford.
Halton, John, Radcliffe Bridge.
Hughes, Richard David, Henley-on-Thames.
James, Henry, Ross.
Jones, John, St. John's Wood.
Lees, William, London.
Manfield, Whitwell, Thirsk.
Mawer, Edward, Newmarket.
Norman, Henry, Folkestone.
Nowell, Richard, Manchester.
Robertson, Frederick Freer Leslie, London.
Rowe, Philip Martin, Bath.
Saunders, C. John Heath, Bromley, Kent.
Scholes, James Spencer, Derby.
Spurling, John, Scarborough.
Stubbs, Thomas Shaw, Bristol.
Tipper, Charles, Romford.
Waight, William Frederick, Liverpool.
Whitworth, Frank, Wishaw.
Williams, John, Wrexham.
Wood, Frederick, London.

March 5th, 1869.

Present—Messrs. Bird, Cracknell, Darby, Davenport, Deane, Edwards, Gale, Garle, and Haselden.

MODIFIED EXAMINATION.

Forty-nine candidates presented themselves; the following forty-one passed, and were duly registered as

CHEMISTS AND DRUGGISTS.

Allden, John, London.
Bemrose, William, London.
Blott, Herbert, Brighton.
Collishaw, John Edward, Sudbury.
Cox, Henry James Wilson, Brighton.
Dinnis, John, Brighton.
Dunn, Henry, Shipley.
Eynon, David Jenkins, Coventry.
Gee, David Gillam, Whitehaven.
Gibson, William Humphrey, Brighton.
Gill, William, Brighton.
Gray, John Frederick, Shrewsbury.
Hartley, William H., Newcastle-under-Lyne.
Hawley, John, Aigburth.
Haycroft, John, London.
Jackson, Charles Frederick, Clifton.
James, William, Bath.
Jones, Thomas Philip, Haverfordwest.
Kersey, Joshua Edmund, London.
M'Intosh, James, Brighton.
Merson, James, London.
Morris, William Watkin, Brecon.
Needham, Richard, Stalybridge.
Pears, Kilby, Brighton.
Powell, Rowland, Bristol.
Preston, Alfred Prince, Abingdon.
Richards, John, Swansea.
Roberts, Robert Michael, Chester.
Robinson, John Threlkeld, Sunbury.
Rose, George, Rolleston.
Rossiter, William Henry, London.
Salter, Francis Septimus, London.
Stafford, John, Gloucester.
Stephens, Henry, Stone.
Steward, John Alfred, Reading.
Swift, William, Staveley.
Taylor, Thomas Charles, Brighton.
Thornley, Charles, Keighley.
Tupholme, Edward Harland, London.
Whitehead, William Ward, London.
Williams, James, Wednesfield.

March 12*th*, 1869.

MODIFIED EXAMINATION.

Present—Messrs. Bird, Carteighe, Cracknell, Darby, Davenport, Deane, Edwards, Evans, Gale, Garle, Haselden, and Southall.

Sixty-two candidates presented themselves; the following fifty-one passed, and were duly registered as

CHEMISTS AND DRUGGISTS.

Allard, George, Liverpool.
Awbery, Albert Richard, London.
Berry, James, Liverpool.
Bletsoe, John, London.
Boor, Frederick, London.
Cartwright, John Horncastle, Leeds.
Clayton, William, London.
Codd, William Breeton, Lincoln.
Collier, James, Wimbleton.
Collins, Richard Pugh, London.
Corbett, Harcourt Edmund, Bristol.
Covell, William Mason, London.
Davis, John Poole, Taunton.
Dunn, George, Waltham Abbey.
Evans, John, Worcester.
Fletcher, Joshua Stephen, Liverpool.
Foden, Joel, Altrincham.
Gouldbourn, William, London.
Harold, William Henry, Battle.
Hasselby, Edward Howdall, Farnham.
Higham, Thomas, Brighton.
Hitchcock, Samuel Conder, London.
Hobbes, Alfred Edward, Newbury.
Hodgkinson, George Arthur, London.
Holt, Edward Charles, Altrincham.
Houchin, Edmund King, London.
Huxham, William, London.
Jones, William Cadwaladr, Cheltenham.
Kemp, Robert, Brighton.
Langman, John, Brentwood.
Leuty, Thomas William Chard, Falmouth.
Lewin, John Harris Stockwell, Brighton.
Mason, John, Hastings.
Meager, Richard George, Birmingham.
Murray, William, Liverpool.
Nixon, Joseph, Manchester.
Paterson, William, Oxford.
Phillips, Benjamin, London.
Plaister, William James, London.
Roper, Henry Edward, Oundle.
Scott, Samuel Swift, St. Leonard's.
Simms, Robert John, Burnham.
Slade, John, Bath.
Smith, Albert, Crediton.
Somerton, George, Clevedon.
Thrower, Edward Arthur, Diss.
Trigg, James Walter, Gloucester.
Whittaker, James, London.
Wilby, George, London.
Williams, Samuel Thomas, London.
Wood, Thomas, London.

March 17*th*, 1869.

Present—Messrs. Carteighe, Cracknell, Darby, Deane, Davenport, Edwards, Gale, Garle, Hanbury, and Haselden.

Thirty candidates presented themselves for the Major and Minor Examinations; the following twenty-three passed, and were duly registered:—

MAJOR (as Pharmaceutical Chemists).

Mallam, G. B., Oxford. Parsons, W., Birkenhead. *Silvester, H. T., Knutsford.

MINOR (as Chemists and Druggists).

Ayre, Henry Mills, Morpeth.
Bennett, Henry, Stafford.
Carr, James Bonwell, Waterloo.
Carroll, The Rev. Denis, LL.B., Dublin.
Childs, Charles John, London.
Clarke, Josiah, Worthing.
Graydon, John, Woolwich.
Harrison, John, Keswick.
†Hicking, Joseph, Belper.
Horsley, Thomas Wood, Manchester.
†Hurst, John Becket, Louth.
Lake, Richard, Colchester.
Lane, William, Bristol.
Loggin, C. F., jun., Stratford-on-Avon.
†Luff, William, Oxford.
Pretty, Charles, Birmingham.
†Price, Thomas, Pembroke Dock.
Tanner, Alfred John, Torquay.
Tomkins, Henry, Bedford.
White, Charles Edwin, London.

REGISTERED APPRENTICES AND STUDENTS.

Name.		Address.
Arundel, Matthew Henry	Mr. Davis	Penge.
Baxter, John Newsam	Mr. Outwin	Rotherham.
Bell, Thomas	Mr. Davis	Harrogate.
Brown, Frederick P.	Mr. Ekin	Grantham.
Brown, Thomas	Mr. Taylor	Kirkby Stephen.
Crundall, Augustus Horton	Messrs. Smith	Cirencester.
Dixon, John Seth	Mr. Bennett	Tunstall.
Endle, Frederick	Mr. Nosworthy	Barnstaple.
Feaver, John	Mr. Feaver	Truro.
Fentiman, Alfred John	Mr. Fentiman	London.
Fletcher, Ashby Brackstone	Mr. Fletcher	Totton.
Foster, Henry Pibworth	Mr. Foster	Portsmouth.
Garside, Samuel Arthur	Mr. Garside	Ormskirk.
Harrison, Wm. Joseph Moston	Mr. Fleming	Liverpool.
Haywood, William	Mr. Dalrymple	Leicester.
Hewett, William Herbert	Mr. Allen	Basingstoke.
Hill, Walter	Mr. Street	Cheltenham.
Holmes, George	Mr. Burnell	Sheffield.
Hughes, Albert James	Mr. Wootton	Wolverhampton.
Hughes, John William	Mr. Williams	Dolgellan.
Lovely, Arthur John	Mr. Smith	Hammersmith.
Mann, Edwin	Mr. Orme	Atherstone.
Marjason, John M.		Dublin.
Mills, John	Mr. Bramley	Uppingham.
O'Connor, Arthur	Mr. Andrews	Norwich.
Odie, Edward Bruce	Mr. Griffiths	Swansea.
Parsons, Henry James	Mr. Morris	Birmingham.
Patridge, William Ford	Mr. Langford	Wisbech.
Perks, Samuel Woodhouse	Mr. Robson	Brighton.
Pidgeon, Charles	Messrs. Taylor and Co.	Bedford.

* Passed in honours; eligible, at the end of the Session, to compete for the Pereira Medal.
† Passed in honours; eligible, at the end of the Session, to compete for the Prize of Books.

NAME.	ADDRESS.	
Rednall, William Rush	Mr. Shipman	Northampton.
Self, Arthur James	Messrs. Owles and Son	Great Yarmouth.
Stanford, Joseph H.	Mr. Goddard	Great Yarmouth.
Stephens, James	Mr. Vardey	Southsea.
Taylor, Alfred	Mr. Taylor	Middlesborough.
Taylor, George	Messrs. Severs and Co.	Kendal.
Tigar, Hardwick Brigham	Messrs. Robinson and Co.	Beverley.
Tuck, William James	Mr. Foster	Portsmouth.
Turner, William		Public Hospital, Sheffield.
Wall, George	Mr. Hodges	Chester.
Walton, George	Mr. Owen	Highbury.
White, John Walwyn	Mr. Lomas	Burton-on-Trent.
Wilkin, Charles Henry	Mr. Lynn	Cambridge.
Wrighton, Charles Edward	Mr. Palmer	Birmingham.

EXAMINATION IN EDINBURGH.

March 11th, 1869.

Present—Messrs. Ainslie, Aitken, Brown, Buchanan, Kemp, Mackay, and Young.

MAJOR (registered as a Pharmaceutical Chemist).

Cook, Thomas . . . Glasgow.

MINOR (registered as Chemist and Druggist).

Aitken, Robert . . . Edinburgh.

REGISTERED APPRENTICES AND STUDENTS.

Clark, Wm., Newcastle. Paterson, Stephen, Edinburgh. Reid, George, Aberdeen.

MODIFIED EXAMINATION.

Seven Candidates presented themselves; the following five passed, and were duly registered as

CHEMISTS AND DRUGGISTS.

Beattie, John, Edinburgh.
King, William, Edinburgh.
Mackie, Keith, Paisley.
Sutherland, James John, Leith.
Turner, William, Edinburgh.

BOTANICAL PRIZE FOR 1870.

A Silver Council Medal is offered for the best Herbarium, collected in any part of the United Kingdom between the first day of May, 1869, and the first day of June, 1870; and should there be more than one collection possessing such an amount of merit as to entitle the collector to reward, a second prize, consisting of a Bronze Medal, and also Certificates of Merit, will be given at the discretion of the Council. In the event of none of the collections possessing such an amount of Merit as to warrant the Council in awarding Medals or Certificates, none will be given.

The collections to consist of Flowering plants and Ferns, arranged according to the Natural System of De Candolle, or any other natural method in common use, and to be accompanied by lists, arranged according to the same method, with the species numbered.

The collector to follow some work on British Botany (such as that of Babington or Bentham), and to state the work which he adopts. The name of each plant, its habitat, and the date of collection, to be stated on the paper on which it is preserved.

Each collection to be accompanied by a note, containing a declaration, signed by the collector, and certified by his employer, or a Pharmaceutical Chemist to whom the collector is known, to the following effect:—The plants which accompany this note were collected by myself, between the first day of May, 1869, and the first day of June, 1870, and were named and arranged without any assistance but that derived from books.

In estimating the merits of the collections, not only will the number of species be taken into account, but also their rarity or otherwise, and the manner in which they are preserved; and should a specimen be wrongly named, it will be erased from the list.

The collections to be forwarded to the Secretary of the Society, 17, Bloomsbury Square, on or before the first day of July, 1870, indorsed "Herbarium for Competition for the Botanical Prizes." After the announcement of the award, they will be retained one month, under the care of the Curator of the Museum, for the inspection of persons connected with the Society, and then returned to the collectors, if required.

No candidate will be allowed to compete, unless he be an Associate, Registered Apprentice, or a Student of the Society, or if his age exceed twenty-one years.

FREE ADMISSIONS TO THE ROYAL BOTANIC SOCIETY'S GARDENS, REGENT'S PARK.

The following pupils of the Class of Materia Medica and Botany, in the Pharmaceutical Society, after examination in the Elements of Structural and Physiological Botany, were recommended by Professor Bentley to Mr. Sowerby, the Secretary of the Royal Botanic Society, for free admission to the Gardens in the Regent's Park, and the privilege has been accorded to them:—

Mr. R. Calvert.
„ James Thos. Clarke.
„ Richard Summerby Crossby.
„ Joseph Cuffling.
„ Horace Davenport.
„ Felix Goodwin.
„ Edward Histed.
„ George Iliffe.
„ John Ingham.
Mr. George Iredale.
„ William Luff.
„ Walter George Mackmurdo.
„ J. E. Maitland.
„ Robert N. Mason.
„ Arthur P. Penrose.
„ John William Reeler.
„ Everton Sainsbury.
„ Walter Henry Smith.
Mr. R. H. Swingburn.

The above are arranged alphabetically, and without reference to actual merit exhibited at the examination.

These orders will admit to the Gardens upon ordinary days in the months of March, April, and August, from nine A.M. till one P.M.; and in May, June, and July, from seven A.M. till one P.M. Such orders, therefore, give every facility to those who possess them of making themselves practically acquainted with plants.

FINANCIAL STATEMENT.—*From January 1st to December 31st*, 1868.

Receipts.	£	s.	d.
Balance in Treasurer's hands (Jan. 1st, 1868)	655	15	1
Balance in Secretary's hands (Jan. 1st, 1868)	9	14	6
Life Members' Fund:			
Fees 110 5 0			
Interest 79 8 4	189	13	4
Government Securities:			
Interest	134	11	0
Rent	100	0	0
Arrears of Subscription	354	16	6
Subscriptions:			
359 London Members 376 19 0			
1380 Country Members 1,449 0 0			
280 Apprentices 147 0 0			
177 Associates 92 18 6	2,065	17	6
Fees:			
82 Pharmaceutical Chemists 578 11 0			
112 Chemists and Druggists 453 12 0			
203 Apprentices 426 0 0			
204 Modified Examination 214 4 0			
22 Registration Certificates (Jury) 1 2 0	1673	15	0
Fees:			
Lecture	232	11	6
Laboratory	723	15	6
Journals:			
Balance of Account	332	4	7
Balance due to Secretary (Dec. 31st, 1868)	24	2	8
	£6,496	17	2

Expenditure.	£	s.	d.
Life Members' Fund:			
Investment	146	19	7
Government Securities:			
Expenses in Transfer of Stock	3	4	0
Conversazione 99 18 4			
Parliamentary and Sundry Expenses attending the Registration under the Pharmacy Act 63 12 0			
Pharmaceutical Meetings 12 13 5			
Diploma Cases 5 8 0			
Repayments 9 9 0			
Sundries 5 7 4	196	8	1
House Expenses	41	16	8
Rent, Rates, Taxes, and Insurance	455	13	9
Repairs and Alterations	142	7	0
Apparatus	6	14	0
Library (including £123. 12*s.* 6*d.* for Bookcases)	172	4	9
Museum:			
Specimens and Sundries 25 3 9			
Curator's Salary 49 0 0	74	3	9
Furniture	70	13	4
Stationery and Office Expenses	34	19	4
Postage	148	15	8
Printing and Engraving	247	18	1
Advertisements	32	3	6
Fixtures and Fittings	5	11	6
Law Costs, 1866 and 1867	67	13	8
Carriage	3	5	4
Collector's Commission	25	0	0
Travelling Expenses	146	12	3
Secretary and Registrar	387	10	0
Wages	221	15	4
Expenses of Society in Scotland	73	2	2
Board of Examiners	394	10	6
Professor of Chemistry and Pharmacy, including payment of Assistant in his Department	300	0	0
Professor of Botany and Materia Medica, including payment of Assistant in his Department	250	0	0
Prize Medals, etc.	5	15	0
Laboratory:			
Director's Salary for year 1868 200 0 0			
And percentage on Fees for Session 1867–1868 85 10 6			
Demonstrator 100 0 0			
Porter's Wages, etc. 65 0 0			
Chemicals, Apparatus, Gas, Coke, etc 98 8 1			
Repairs, Painting, etc. 87 1 3	635	19	10
Balance in Treasurer's hands (Dec. 31, 1868)	2,206	0	1
	£6,496	17	2

BENEVOLENT FUND ACCOUNT FOR THE YEAR 1868.*

	£	s.	d.
Balance in Treasurer's hands (Jan. 1, 1868)	262	6	1
Balance in Secretary's hands (Jan. 1, 1868)	3	12	7
Dividends	274	5	9
Donations	54	1	6
Subscriptions	551	11	6
	605	13	0
	£1145	17	5

	£	s.	d.	£	s.	d.
6 Annuitants, to Christmas, 1868, at £30 each	180	0	0			
2 Annuitants, elected Oct. 1868 (2 months to Christmas), at £5 each	10	0	0			
				190	0	0
Widow of a late Member, at Sunderland, towards expenses in getting one of her children into the Commercial Travellers' School (second grant)				10	0	0
Widow of a late Member, at Birmingham, permanently imbecile (second grant)				10	0	0
Member, late at Appledore, age 46, wife and six children (second grant)				20	0	0
Widow of a late Member, at Knottingley, age 75, cripple				20	0	0
Orphan Daughter of a late Member, at Southampton (second grant)				10	0	0
Member, late at New Ferry, near Liverpool, age 61, wife, age 58, both in ill-health (third grant), elected an Annuitant Oct. 1868				10	0	0
Widow of a late Member, at London (second grant)				10	0	0
Member, late of Stratford, Essex, age 64, wife and two children (second grant), now a Candidate for Annuity				10	0	0
Member, late at Wakefield, age 38, wife and six children				20	0	0
Premium on the Orphan Bentley's Policy of Assurance				1	11	2
Advertisements				2	2	0
Postage				9	16	8
Printing and Stationery				15	16	0
Purchase of £826. 9*s.* 1*d.* Consols				769	7	9
Commission on Transfer of Stock	5	12	10			
Power of Attorney	0	6	6			
				5	19	4
Balance in Treasurer's hands (Dec. 31, 1868)				31	1	9
Balance in Secretary's hands (Dec. 31, 1868)				0	2	9
				£1145	17	5

Consols., 31st December, 1867	9,023	10	11
Consols., purchase of, as above	826	9	1
	£9,850	0	0

We, the undersigned Auditors, have examined the Accounts of the Pharmaceutical Society, and find them correct agreeably with the foregoing statement; and that, as shown by the books of the Society, there was standing to the account of the Society, at the Bank of England, on the 31st of December, 1868 :—

General Fund (New 3 per Cents.)	£4,600	0	0
Life Members' Fund (New 3 per Cents.)	2,890	0	0
Benevolent Fund (Consols)	9,850	0	0
Bell Memorial Fund (Consols)	2,050	0	0
Pereira Memorial Fund (Consols)	100	0	0

FREDERICK ANDREWS,
FREDERICK BARRON,
JOHN B. MACKAY,
WILLIAM SQUIRE,
ROBERT WESTWOOD,
Auditors.

9th February, 1869.

* List of Subscriptions and Donations, see p. 605.

JOHN MACKAY, Edinburgh, in Account with PHARMACEUTICAL SOCIETY, LONDON.
From 1st January to 31st December, 1868.

DR.

1868.		£	s.	d.
May 23.	Cash from London	50	0	0
	Balance due to Secretary	31	7	9
		£81	7	9

CR.

	£	s.	d.
Publications for Library	7	14	8
Various Printing Accounts	6	13	6
Expense of Annual Meeting	8	12	7
Attendance at Door and Circulating Billets	1	2	6
Postage Stamps	4	8	6
Rent of Hall and Museum	30	0	0
Insurance, 6*s.*, Cash Box, 7*s.* 6*d.*, Painting, 2*s.* 6*d.*	0	16	0
Various Meetings and Extra Work in connection with the New Pharmacy Act	15	0	0
Curator, W. Hill	5	0	0
Petty Expenditure	2	0	0
	£81	7	9
Balance due to Secretary	£31	7	9

We, the undersigned, have examined the foregoing statement; find the various items correctly entered; and the balance due to Secretary, Dec. 31, 1868, £31 7*s.* 9*d.*

Edinburgh, 24th February, 1869.

WILLIAM AITKEN,
H. C. BAILDON, } *Auditors.*

THE SANDFORD TESTIMONIAL.

	£	s.	d.
Amount of Subscriptions previously published in the Journal	441	2	0

	£	s.	d.
Baker, W., Retford	0	10	6
Baxter, George, Worksop	0	10	6
Bond, L., Tiverton	0	5	0
Bowerbank and Son, Cockermouth	1	1	0
Bradley, E. S., Ashbourne	0	10	0
Braithwaite, J. C., Kentish Town	1	1	0
Bulley, Mr., Exeter	0	2	6
Butland, Mr., Exeter	0	2	6
Cocking, George, Ludlow	0	5	0
Coles, C., King's College Road, N.W.	0	10	6
Duncanson, W., Stirling	0	5	0
Effland, Mr., 197, Waterloo Road	0	5	0
Ekins, John, Bedford	0	5	0
Fever, W., Olney	0	5	0
Fisher, J. F., Carlisle	0	5	0
Foster, Mr., Collumpton	0	10	0
Foulkes, W. A., Rhyl	0	5	0
Fox, Dr. Tilbury, 40, Sackville St.	1	1	0
Freeman, T. W., Ledbury	0	2	6
Fryer and King, Huddersfield	1	1	0
Gaitskell, J., Gosforth	0	5	0
Gall, B. D., Woodbridge	1	1	0
Garl, W., Bampton	0	3	0
Garrod, Dr., F.R.S., Harley St., W.	1	1	0
Gaunt, R. D. H., Union St., Borough	0	10	6
Grant, Mr., Exeter	0	2	6
Green, J. G., Bilston	0	5	0
Griffiths, A. W., Lamb's Conduit St.	0	5	0
Griffiths, J., Clerkenwell	0	5	0
Groves, Henry, Weymouth	1	1	0
Groves, W. E., Blandford	0	10	6
Hall, H. R., Hull	0	5	0
Handcock, John, Leeds	0	5	0
Havill and Son, Tiverton	0	5	0
Haydon, H., Tiverton	0	2	6
Hollier, E., Dudley	0	10	6
Hughes, J., York Glass Company	1	1	0
Hurst, Mr., Exeter	0	10	6
Hurst, John, Louth	0	10	0
Hurst, John B., Louth	0	5	0
Husband, M., Exeter	0	10	0
Inglie, W. G., Cardiff	0	5	0
Iverach, J. G., Kirkwall	0	10	6
Jackson, James, Heywood	0	2	6
Jones, A. M., Brynmawr	0	5	0
Keal, F. P., Swansea	0	2	6
Keene, John, 74, New Bond Street	1	1	0
Lewis, Henry, St. Alban's	0	2	6
Lindsay, Mr., Horsham	0	2	6
Lloyd, J., Swansea	0	2	6
Lock, William, Boston	0	10	6
Marshall, R., Boston	0	10	6
Medcalf, E., Lower Tooting	0	5	0
Morgan, Frank, Gaudrion, Petworth	0	5	0
Muskett, James, Harleston	0	10	6
Napier, G. L., Exeter	0	2	6
Nayler, J., Bow	0	2	6
Nidd, J., Boston	0	5	0
Norrish, H., Tiverton	0	5	0
Palk, John, Exeter	1	1	0
Palmer, R., 35, Ovington Sq., S.W.	1	1	0
Pickering, Mr., Horsham	0	2	6
Pilley, S., Boston	0	5	0
Platt, W., Everton	0	2	6
Portes, Mr., Exeter	0	1	0
Potts, R. S., Ilkeston	0	2	6
Pratt, Josiah, Wolverhampton	0	5	0
Price, William, Birmingham	0	2	6
Radley, W. V., Sheffield	1	1	0
Ranken, J. A., Forfar	0	5	0
Rees, David, Carmarthen	0	2	6
Rickard, J. R., Wadebridge	0	10	6
Roberts, J. M., Pwllheli	0	5	0
Rossiter, G., Tiverton	0	2	6
Saer, D. Prothero, Pembroke Dock	0	5	0
Saltor, T., Boston	0	2	6
Sanders, G. L., Tiverton	0	5	0
Sequeira, H. L., M.R.C.S., Jewry St. E.C.	0	10	6

	£	s.	d.
Shaw, E. P., Wakefield	1	1	0
Silvester, J., Knutsford	0	10	0
Skinner, J., Cirencester	0	10	6
Smart, John, Scarborough	0	5	0
Smith and Sons, Norwich	1	1	0
Sowerby, John, Carlisle	0	5	0
Sparr, G., Boston	0	5	0
Spencer, Thomas, Workingham	0	10	6
Staning, W., Hull	0	5	0
Stedman, R. B., West Malling	0	5	0
Taylor and Cuthbert, Bedford	0	10	0
Thomas, J. H., and Son, Boston	1	1	0
Twinberrow, John, Worcester	0	5	6
Williams, Elias, Cerrig-y-Druidion	0	5	0
Williams, J. D., Bodmin	0	5	0
Williams, Phillip, Horsham	0	10	0
Wood, William, Pontypool	0	2	6
Wood, H., Tiverton	0	2	6
York Glass Company, per Mr. John Hughes	2	2	0

Subscriptions may be forwarded by cheque, Post-Office order, or stamps, to the Treasurer, Mr. B. B. Orridge, 32, Ironmonger Lane, London, E.C., to Elias Bremridge, 17, Bloomsbury Square, London, W.C., or to the Honorary Secretaries.

Gentlemen who have not yet paid their subscriptions are requested to be good enough to remit the amount before the 7th of April.

The following circular has been issued:— "*March*, 1869.

"Dear Sir,—The Committee having decided to close the Subscription List to this Fund on the 7th of April next, we beg to ask if you desire your name to be added thereto,—We are, dear Sir, yours faithfully,

"Michael Carteighe, 172, *New Bond Street*, *London*, *W.*,
"John Mackay, 119, *George Street*, *Edinburgh*,
"Henry Matthews, 60, *Gower Street*, *London*, *W.C.*,
"Hon. Secs."

Errata.—Page 425, line 16, *for* Pughs, W. G., *read* Inglis, W. G.; page 422, line 24, *for* Bayley, John L., *read* Bosley, John L.; page 422, line 40, *for* Cunningham and Sparrow, *read* Sparrow, W., Cunningham, F.

PHARMACEUTICAL SOCIETY, EDINBURGH.

At a meeting of a few members of the Pharmaceutical Society, held on the 25th February, it was suggested by Mr. H. C. Baildon that the time had arrived when it was desirable to present Mr. John Mackay with a fitting Testimonial for his long and arduous services, gratuitously rendered to the Society for twenty-eight years, as Honorary Secretary for Scotland. The following Members of Council were present, viz.:—Mr. W. Aitken, Mr. H. C. Baildon, Mr. G. Blanshard, Mr. D. R. Brown, Mr. D. Kemp, and Mr. J. R. Young—who expressed their cordial concurrence in the proposal. Mr. H. C. Baildon was requested to act as *Honorary Treasurer*, and Mr. W. Ainslie as *Honorary Secretary*. The sums below have already been subscribed:—

	£	s.	d.
Aitken, Mr. W., Edinburgh	2	2	0
Aitken, Mr. James, Edinburgh	0	10	6
Allan, Mr. W., Dumfries	0	10	6
Anderson, Mr. W., Edinburgh	0	10	6
Anderson, Mr., Musselburgh	0	5	0
Archer, Professor	1	1	0
Attfield, Professor, London	2	2	0
Baildon, Mr. H. C., Edinburgh	2	2	0
Baildon, Mr. William, Edindburgh	0	10	6
Bell and Co., Messrs. John, London	2	2	0
Bentley, Professor, London	1	1	0
Bourdas, Mr., London	2	2	0
Brady, Mr. H. B., Newcastle	2	2	0
Bremridge, Mr. E., London	1	1	0
Brown, Mr. R. S., Edinburgh	0	10	6
Burrell, Mr. G., Montrose	0	10	6
Cameron, Mr. W., Kelso	1	1	0
Clingan and Mortimer, Messrs., Edinburgh	2	2	0
Cumming, Mr. Charles, Edinburgh	2	2	0
Davidson, Mr. J., Elgin	1	1	0
Davidson and Co., Messrs., Aberdeen	1	1	0
Duncan, Flockhart, and Co., Messrs., Edinburgh	10	10	0
Dunn and Co., Messrs., London	2	2	0
Ellis, Mr. B., Banff	1	1	0
Evans, Mr. H. S., London	2	2	0
Ewart, Mr. D., Leith	0	10	6
Fairgrieve, Mr. Thos., Edinburgh	2	2	0
Finlayson, Mr. Thomas, Leith	1	1	0
Flux, Mr. William, London	1	1	0
Gardner and Ainslie, Messrs., Edinburgh	4	4	0
Garle, Mr. J., Bromley	1	1	0
Gilmour, Mr. W., Edinburgh	1	1	0
Gray, Mr. A. F., Edinburgh	0	10	6
Greig, Mr. F., Dunbar	1	0	0
Guthrie, Mr. John, Edinburgh	0	10	6
Harley, Mr. James, Edinburgh	0	10	6
Hearder, Mr. T. B., Edinburgh	0	10	6
Henry, Mr. H., Macduff	0	5	0
Heron, Mr. James, Edinburgh	1	1	0
Hill, Mr. W. G., Edinburgh	0	10	6
Hills, Mr. Thomas Hyde, London	2	2	0
Hutchinson, Mr. John, Edinburgh	1	1	0
Kemp, Mr., Portobello	2	2	0
Kennedy, Mr. Adam, Edinburgh	1	1	0
Kerr, Mr. Charles, Dundee	1	0	0
Lees, Mr. Robert, Edinburgh	1	1	0
Leitch, Mr. William, Edinburgh	1	1	0
Macadam, Dr. Stevenson, Edinburgh	2	2	0
M'Culloch, Mr. T. T., Edinburgh	0	10	6

	£	s.	d.
Macdonald, Mr. J., Lasswade	0	10	0
Macfarlane and Co., Messrs., Edinburgh	5	5	0
Macfarlan, Mr. J. Y., Edinburgh	0	10	6
Macintosh, Mr. A., Rothesay	0	10	6
Mackay, Mr. D. M., Aberdeen	0	10	6
Mackenzie, Mr. James, Edinburgh	1	1	0
Marshall, Mr. W. F., Edinburgh	1	1	0
Mitchell and Fraser, Messrs., Inverness	1	1	0
Morson, Mr., London	2	2	0
Munro, Mr., Inverurie	0	5	0
Murdoch, Mr., Falkirk	1	1	0
Napier, Mr. Alexander, Edinburgh	1	1	0
Niven, Mr. W. R, Edinburgh	0	10	0
Noble, Mr. Alexander, Edinburgh	2	2	0
Prentice, Mr. J., Edinburgh	0	10	6
Raimes, Blanshards, and Co., Messrs.	5	5	0
Redwood, Dr., London	1	1	0
Renwick, Mr. T. Kerr, Edinburgh	2	2	0
Robertson, Mr. James, Edinburgh	2	2	0
Sandford, Mr. G. W., London	2	2	0
Smith and Co., Messrs. T. and H., Edinburgh	5	5	0
Spence, Mr. Alfred, York	2	2	0
Stanford, Mr. E. C. E., Glasgow	1	1	0
Steel, Mr. D., Edinburgh	0	10	0
Stephenson, Mr. J. B., Edinburgh	1	1	6
Storrar, Mr. D., Kirkcaldy	1	1	0
Williams, Mr. J., London	1	1	0
Wilson, Mr., Perth	0	10	0
Wilson, Mr. J., Leith	1	1	0
Wilson, Mr. James, Edinburgh	0	10	6

No complete list of Members of the Pharmaceutical Society and of Chemists and Druggists having been made up to the present time, the Secretary to the Fund requests that any member who has not yet received a circular will be good enough to communicate with him, and one will be immediately sent; or a Subscription towards the Fund may be remitted either to the Secretary or to the Treasurer, who will, with the receipt, enclose a circular.

Any members who have, from inadvertence, *not* been waited on, in Edinburgh or Glasgow, will please to send their Subscriptions to either of the undersigned.

The list of Subscriptions from Glasgow has not been received in time for the April number of the Journal.

WILLIAM AINSLIE, *Hon. Secretary*, Edinburgh.
HENRY C. BAILDON, *Hon. Treasurer*, Edinburgh.

PHARMACEUTICAL MEETING.

Wednesday, March 3rd, 1869.

MR. H. S. EVANS, VICE-PRESIDENT, IN THE CHAIR.

Mr. HANBURY drew attention to a specimen of black wax which had been received from Madras. It was sent by a gentleman who, having observed a note read some time ago by Mr. Reynolds, of Leeds, at a meeting of the British Pharmaceutical Conference, on a blackish-green insect wax, thought that article was probably identical with the black wax of the Indian bazaars, of which the specimen before them was a sample. It appeared that this Indian black wax was only common beeswax made from old and dirty comb. He (Mr. H.) did not think it was identical with the article described by Mr. Reynolds.

Dr. ATTFIELD had found that there was a difference in the melting-point of the two articles.

The CHAIRMAN called on Mr. Wood to make some observations on

SULPHUROUS ACID.

Mr. WOOD said he had not intended to make any special communication on the subject, but simply, if the opportunity offered during the discussion following the paper about to be read, which treated of a kindred matter, to say a word or two on Mr. Umney's communication of last month. He added:—I find in that paper that the author referred to a previous article of mine in the 'Pharmaceutical Journal,' in which it is stated, that sulphurous acid of the B.P. 1867, "is of the same strength and prepared in the same manner" as the acid of the B.P. 1864. Mr. Umney implies that this passage is not strictly correct,

because, although both works indicate the same specific gravity (1·04), he finds by calculation that the acid of the B.P. 1864 contained only 8·3 per cent., while the B.P. 1867 specifies that the acid contains 9·2 per cent. of SO_2. Now the B.P. 1864 only indicated that 164 measures of iodine solution should be required for the oxidation of a fluid drachm of the acid, and it is from these data that Mr. Umney calculates the 8·3 per cent. of SO_2. But after carefully repeating the calculations, I confess I cannot arrive at Mr. Umney's result, and am led to believe that my original statement is perfectly accurate. A fluid drachm of water weighing 54·68 grains, a fluid drachm of acid of sp. gr. 1·04 will weigh 56·87 grains. 164 measures of iodine solution will oxidize 5·248 grains of SO_2. Consequently, if 56·87 grains contain 5·248, then 100 will contain 9·2 and not 8·3.

I do not know whether I am justified in speculating as to the source of this discrepancy in the results of a simple calculation, but, if I may be permitted to do so, I would suggest that Mr. Umney has followed the common but erroneous assumption, that a fluid drachm of water contains 60 grains. This would exactly account for the difference in our results. Of course the real weight of a fluid drachm of water is 54·68 grains, and is so given in the Pharmacopœias.

The experimental results which Mr. Umney has given us in this paper are of very great interest and value, especially at the present time, when sulphurous acid is being frequently ordered for administration and for use in the form of spray. As far as I gather, Mr. Umney finds it very difficult or almost impossible to prepare a solution of sulphurous acid of the strength given in the Pharmacopœia, unless pressure be employed to augment the solubility. I confess I have never met with this difficulty, providing a copious and sufficient stream of gas be employed, conducting the operation out-of-doors, or somewhere where the fumes can be carried away. I prepared in three hours this morning a pint of the acid having a sp. gr. 1·048, by simply bubbling a rapid stream of gas through the water, keeping both the wash-bottle and the receiving-vessel cool; but I entirely agree with Mr. Umney that it would be impossible to do this with the exact proportions of ingredients ordered in the Pharmacopœia. Unless the quantity of charcoal and oil of vitriol be much augmented in relation to the water to be charged, it is impossible to make a saturated solution. I may add, as a little practical point which may be of use to some, that an ordinary iron quicksilver-bottle forms a convenient flask for generating the gas. These bottles are to be found in most laboratories, and they are of little or no use. It is simply necessary to remove the screw-plug and fit in a cork, with the bent tube leading to the wash-bottle. The flame of a large Bunsen burner may be applied direct to the iron vessel without any fear of breakage, and a rapid stream of gas at once obtained. The action of strong oil of vitriol, *when hot*, upon iron is quite different to that of dilute sulphuric acid; no hydrogen is liberated, sulphurous acid being formed by a chemical change analogous to that which occurs in the case of copper.

There is one other point in connection with the Pharmacopœia description of sulphurous acid, which Mr. Umney did not refer to in his paper, but which appears to me to be of considerable importance in experiments determining the exact strength of acids of different gravities. I refer to the test given for determining the percentage of SO_2 by a standard solution of iodine. The reaction between iodine and sulphurous acid was made the basis of a general method of volumetric analysis a long time ago, and has been carefully studied by chemists. All those who have worked with it are aware that it is liable to furnish erroneous and discordant results unless certain precautions are taken. Bunsen, who subjected the method to a most searching investigation, has indicated that to ensure accuracy, the sulphurous acid operated with must be previously diluted until its strength does not exceed 0·04 per cent. Now the Pharmacopœia directs 34·7

grains of the acid to be mixed with *an ounce* of water previous to the addition of the iodine solution; but to reach the extent of dilution indicated by Bunsen, that quantity of acid must be mixed with about *a pint* of water before proceeding to its saturation.

Of course, in using so large a quantity of water, care would have to be taken that it had been previously well boiled to expel the oxygen, and cooled out of contact with air. Consequently, it follows that if the Pharmacopœia test is to be employed as a method of exact estimation, then the directions given are bad and require modification; but if it is merely regarded as a ready means of judging of the strength of the acid for practical purposes, then the point I have referred to is a matter of no importance. I hope it will be understood that in thus noticing what appears to me may be a defect in the Pharmacopœia method of testing, I do not wish in the slightest degree to question the accuracy of the results obtained by Mr. Umney.

With regard to the relative advantages of a concentrated, and a 5 per cent. solution of sulphurous acid, I can cordially concur with Mr. Umney in pronouncing it almost impossible to preserve the Pharmacopœia acid for any great length of time without considerable loss of strength; but at the same time I also find it very difficult to keep a 5 per cent. solution without its undergoing a sensible amount of change. It appears to me therefore that to devise a definite and tolerably permanent solution of sulphurous acid for medical purposes, is a problem which has not yet been satisfactorily solved.

Dr. Attfield remarked, with reference to one of the points alluded to by Mr. Wood, that probably the word ounce in the Pharmacopœia was a misprint for pint.

Dr. Redwood said he could not admit that this was the case, nor did he consider, for the purpose contemplated in the Pharmacopœia, that any advantage would result from using the larger quantity of water, as the test could not then be so readily applied; and as the acid could not be kept in a perfectly uniform state, but was necessarily subject to constant change, a test that could be easily and quickly used, and gave good approximate indications, was what was required. As the result of long and very considerable experience in the manufacture and testing of sulphurous acid, having for many years been accustomed to conduct the processes almost daily, he could say, that not only was it quite possible to obtain the acid of the strength indicated, but also that the test was a good and convenient one for the purpose intended. At the same time, he was quite ready to admit what he had stated to Mr. Umney some time ago, when referred to on the subject, that an acid much weaker than that ordered, would probably be equally, if not more, suitable for the uses to which it is applied in medicine, than the strong acid now ordered. He had, in fact, stated to Mr. Umney, that the reduction of the strength to a five per cent. solution was under the consideration of the Pharmacopœia Committee, but beyond this he did not consider it desirable to urge this point; for while the stronger acid was ordered, it was their duty to follow the directions of the Pharmacopœia as nearly as they could.

Mr. Umney said his statement of the strength of the acid produced by the Pharmacopœia process was founded upon experiments made by following the instructions given, and Mr. Wood admitted that the quantity of sulphuric acid and charcoal was insufficient to yield a solution of the full strength.

ON DILUTED NITRO-HYDROCHLORIC ACID.

BY WILLIAM A. TILDEN, B.SC., F.C.S., DEMONSTRATOR IN THE SOCIETY'S LABORATORIES.

Nitro-hydrochloric acid is a preparation found in all the pharmacopœias. But the liquids designated by this somewhat indefinite title differ very notably in strength and in composition. This arises partly from the circumstance that the nitric and hydrochloric acids recommended by the different pharmacopœias contain different percentages of real acid, partly because they are mixed in different proportions and in different ways. In some cases the undiluted acids are mixed and preserved in that state; in others, as in the British Pharmacopœia, they are diluted after a certain prescribed interval, and in yet others they are diluted with water at the time of mixing.

In the British Pharmacopœia of 1867, nitric acid (sp. gr. 1·42) and hydrochloric acid (sp. gr. 1·16) are directed to be mixed together in the proportion of three fluid ounces of the former to four fluid ounces of the latter, twenty-four hours previously to adding the water. The intention obviously acted upon in giving these directions is to permit the chemical reaction entered into by the acids to proceed as far as possible towards completion.

Any one who has prepared the acid according to the instructions of the British Pharmacopœia has, of course, witnessed the change of colour and the evolution of permanent gas which always take place in that operation. That the reaction of the undiluted acids gives rise to permanently gaseous products and consequently, if the experiment be conducted in the usual way, to loss of material, is apparent from the coloured atmosphere of the bottle and from the acid dew which films the table upon which it stands. It is also obvious that this loss must be variable in amount, according to the circumstances under which such operation is conducted. Thus when a bottle no larger than is necessary to contain the whole of the liquid is employed, a very considerable deficiency must be the result; when a capacious mixing-vessel is used, the loss is smaller, from the fact that the gaseous resultants partly remain in the bottle and are absorbed again on the addition of the water. Temperature must also have an important influence; in the summer-time or in a warm locality, the action will proceed more rapidly and to a further limit, and the effect of this will be the production of a greater quantity of the gaseous emanation, which will also occupy a larger volume.

The experiments about to be detailed were undertaken with the view of ascertaining, first, if the loss encountered from these causes could proceed to an extent that would be of importance; and, secondly, if the composition of the dilute acid produced by the present official process differed perceptibly from that of the dilute acid prepared by the hitherto usual plan, namely, by the addition of the water simultaneously with the intermixture of the acids. The following results illustrate the points alluded to:—Two acids were taken of a strength nearly approaching that indicated by the Pharmacopœia. They were mixed in the proportions ordered, allowed to stand during twenty-four hours in a stoppered Winchester quart (*i. e.* in a vessel capable of holding about ten times the quantity), and the next day were diluted and at once tested.

Six fluid drachms required for neutralization 808·64 grain-measures of the volumetric solution of soda. Half the quantity was prepared in the same way in a Winchester quart. Of this, six fluid drachms took 828·69 grain-measures of the standard soda.

When the same acids were diluted before mixing, so that no preliminary decomposition was permitted, and tested in a similar way, it required 929 grain-measures to saturate six fluid drachms.

During the time that the acids were allowed to stand together before dilution, the stopper of the bottle was several times thrown out by the escaping gas; but, by keeping the mouth closed by a watch-glass during the whole of the twenty-four hours, and taking the opportunity of a cold night, the loss by vaporization was reduced very considerably, though not altogether avoided. The least unfavourable result obtained was as follows:—Two acids, which, when mixed in Pharmacopœial proportions, but diluted at once with the water, required 904·315 grain-measures of soda to neutralize six fluid drachms, took for the same quantity, when made according to official directions, only 870·36 grain-measures.

It deserves to be noticed that these are results obtained in the winter season; the disparity would be very greatly exaggerated in the summer at a temperature from 30° to 40° higher.

The saturating power as well as the density attributed to the nitro-hydrochloric acid, described in the Pharmacopœia, is in excess of that required by theory,—a circumstance that can be accounted for only by assuming that contraction of volume occurs when the mixture is effected. For calculated from the data found in the Pharmacopœia, and assuming that no diminution of saturating power at all occurs in the making, six fluid drachms should require 899·7 instead of 920 grain-measures, as stated. Actually, it is always a considerable but variable amount below this. The experiments, therefore, in which such numbers were obtained, must have been performed under some exceptionally favourable circumstances, such as in practice could not be at command.

Then comes the question as to the relative advantages of the two modes of mixing. Every one is acquainted with the usual explanation of the change that occurs in producing what is known as aqua regia. The investigation of the constitution of this liquid was successfully carried out twenty years ago by Gay-Lussac. The nitric and hydrochloric acids, after standing for twenty-four hours, as the Pharmacopœia describes, constitute a kind of aqua regia. It is a liquid which holds in solution hydrochloric and nitric acids, part of which have undergone change, producing chlorine and a compound which may be called nitric chloroperoxide:—

$$2\,HNO_3 + 6\,HCl = 2\,NOCl_2 + Cl_2 + 4\,H_2O.$$

The chloronitric compound, being very volatile, partly escapes. If this mixture be diluted with the proper quantity of water and immediately examined, it has these characters:—it bleaches litmus and indigo; it dissolves gold-leaf without the application of heat; it decomposes and decolorizes permanganate of potassium; mixed with iodide of potassium, it sets free a large quantity of iodine, simultaneously causing an effervescence due to the escape of nitric oxide. The free iodine and gas were measured once or twice, but, as might have been expected, the results were not constant. From six fluid drachms, in one case as much as 9½ cub. cent. of gas (about half the volume of the liquid) were collected. It was proved to be nitric oxide by reddening when mixed with air, and by being totally absorbed by ferrous sulphate. The same acid, examined a few days afterwards, was still capable of bleaching and dissolving gold, though less rapidly, but, when mixed with iodide of potassium, there was a much smaller amount of liberated iodine, and a bubble of gas no larger than a pea.

In little more than a week, change had progressed so far that there was very slight decomposition of iodide of potassium, and the bleaching effect could be only imperfectly produced; moreover, permanganate was very little affected by it. It seems from this, that the action of the water upon aqua regia is to set up immediate decomposition of the chloronitric compound, effecting its resolution into hydrochloric acid, and the products of the decomposition of nitric peroxide, namely, nitric and nitrous acids:—

$$2NOCl_2 + 3H_2O = 4HCl + HNO_3 + HNO_2.$$

Afterwards, assisted doubtless by daylight, the free chlorine oxidizes the greater part of the nitrous acid present, restoring it to its original condition of nitric acid. This part of the reaction, however, seems never to attain completion, but appears to be arrested at a certain point, which depends upon the degree of dilution.

For the sake of comparison, some nitric and hydrochloric acids of the same strength were mixed with water in the pharmacopœial proportion. Freshly prepared, the mixture seemed to contain no chlorine, but as time went on a certain amount was developed, which continued to increase, till, in less than a fortnight, the reactions furnished by this liquid coincided, as nearly as possible, with those obtained with the use of the officinal preparation. The amount of chlorinous constituent indicated in both cases is minute. The probability is, that in very dilute solutions, holding both nitric and hydrochloric acids, there is an atom of oxygen suspended, as it were, between the elements of nitrous acid, and those of the hydrochloric acid, giving rise, according to the concentration of the liquid, to nitric acid and hydrochloric acid when extremely dilute; or to nitrous acid, water, and chlorine, when less of the diluent is present:—

$$HNO_2 \mid O \qquad \begin{matrix} H \mid Cl. \\ H \mid Cl. \end{matrix}$$

This sort of phenomenon occurs in numberless chemical decompositions, but at present can receive only a very imperfect kind of explanation.

I feel justified, then, in adopting the two following conclusions:—first, that there is a loss in preparing nitro-hydrochloric acid, according to the plan of the present Pharmacopœia, and that the solution obtained is consequently not constant in quality. I think it may be admitted, however, that the deficiency is for practical medicinal purposes insignificant. Secondly, that there is no purpose served in delaying the addition of the water, unless the diluted product has been quite recently prepared. In the absence of any experiments proving the superiority, from a therapeutic point of view, of the solution which is the result of this process, I should recommend that the acids be poured at once into the water in the proportions directed. It will be found that the product so obtained will answer to the tests indicated in the Pharmacopœia more satisfactorily than that made by the official process, whilst as regards chemical constitution the lapse of a short interval will render it identical with that preparation.

Dr. Redwood said he had made a great many experiments with this acid, some of the results of which accorded with those obtained by Mr. Tilden. The object of ordering the strong acids to be mixed some hours before diluting them with water was at once to obtain the product when mixed, in the state in which it was intended to be used. If the water was added to the strong acids before, or at the moment of, mixing them, a different result was obtained, and the product would not, in the first instance, contain free chlorine. This was shown by its not dissolving gold leaf, and, to the best of his recollection, it was necessary to keep it for two or three weeks before the required reaction took place, but no doubt this would in some degree depend on the extent to which it was exposed to direct sunlight. By following the instructions of the Pharmacopœia, as soon as mixed it was ready for use.

PROVINCIAL TRANSACTIONS.

HULL CHEMISTS' ASSOCIATION.

The usual Monthly Meeting of the Hull Chemists' Association was held at Howden's Paragon Hotel, on Thursday evening, March 11th. In the absence of the President, Mr. ANTHONY SMITH was unanimously voted to the chair. The minutes of the previous meeting were read and confirmed. The following resolution was moved, seconded, and carried unanimously :—"That the Committee be called together, and they be requested to draw out the rules for the governance and guidance of the Association ; and the Committee is hereby requested to submit the same for the consideration of the members at an early date."

A cordial vote of thanks, on the motion of the SECRETARY, duly seconded by Mr. STEEDMAN, was accorded to Mr. Smith for the very able manner in which he had occupied the chair. Mr. Smith briefly returned thanks.

LEEDS CHEMISTS' ASSOCIATION.

The Sixth Meeting was held in the Library of the Philosophical Society, March 10, 1869.

The Hon. Sec., Mr. YEWDALL, read the "Pharmacy Act Amendment Bill," introduced into the House of Commons by Lord Robert Montagu, and the feeling of the meeting was embodied in the following resolutions:—

Resolved,—That this meeting of members of the Leeds Chemists' Association has considered the "Pharmacy Act Amendment Bill," introduced into the House of Commons by Lord Robert Montagu. That whilst regarding the provisions of the same as unobjectionable in themselves (although they appear to be unnecessary), this meeting deprecates further legislation upon the subject until the persons registered under the Act of 1868 shall have had the opportunity of saying, through the Council of the Pharmaceutical Society, what amendments are desirable.—Moved by Mr. S. Taylor, seconded by Mr. Roberts.

Resolved,—That a copy of the foregoing resolution be sent to the Council of the Pharmaceutical Society, and that the Committee of this Association watch the further progress of the Bill.—Moved by Mr. Brown, seconded by Mr. T. Wilson.

The President, Mr. REYNOLDS, made the communication announced for the evening, entitled "An Hour with the American Pharmaceutical Association." By the kindness of Mr. Deane, of Clapham, a small series of photographic portraits of leading members of the American Pharmaceutical Association was exhibited. Mr. Reynolds took the volume of Proceedings of the Association for 1867 as a groundwork, and rapidly ran through its Report of the Meeting, including the Reports of Committees on the progress of Pharmacy, on the Drug Market, and the full text of the papers read, etc. He took occasion especially to commend the Report on the Progress of Pharmacy as being a valuable year-book of the subject, and regretted that such a record was still a desideratum to English pharmaceutical literature.

Some of the points introduced led to a discussion, in which several members joined.

LIVERPOOL CHEMISTS' ASSOCIATION.

Ninth General Meeting held at the Royal Institution, February 18th, 1869; the President, Mr. J. F. ROBINSON, in the chair.

Mr. Thomas Kershaw, of Ormskirk, was elected a member of the Association.

Donations to the Library of the second edition of the 'Guide to the Modified Examination'; 'The Chemist and Druggist'; the Proceedings of the Liverpool Architectural Society, were announced, and thanks voted to the donors.

After some miscellaneous business, Mr. A. E. TANNER read a paper "On some Pharmaceutical Preparations."

He said that his remarks would be confined to a very few preparations, giving his experience and opinions on points of manipulation in their manufacture. As far as possible chemists should make their own galenical preparations, as by following the directions of the Pharmacopœia closely, they may be prepared by any person having some little experience in pharmaceutical manipulation. Excellent tests are also given for ascertaining the purity of chemicals, and it would be well to test every parcel received. This may soon be done very easily, and of its necessity personal experience will convince us. A case in which Pulv. Antim. Tart. was sent instead of Pulv. Acid. Tart., and which was not detected until serious consequences had arisen, had fallen under his own notice. The first preparation spoken of was Syr. Ferri Phosph. This is prepared by precipitating a solution of sulphate of iron with phosphate of sodium, washing and dissolving the resulting phosphate of iron in dilute phosphoric acid, and forming a syrup by the addition of sugar. The phosphate of iron should not be pressed too much before dissolving, or the resulting syrup will not make up 12 fl. oz., and also the phosphate, when too much pressed, cannot be so well diffused in water, and dissolves more slowly in the phosphoric acid, requiring long stirring, which is injurious by favouring absorption of oxygen. The syrup is stated to contain 1 grain of phosphate of iron in 1 fluid drachm; this, however, is not the case, for although the quantity of sulphate of iron is sufficient, perfect precipitation does not take place, considerable traces of iron being always found in the filtrate. The acetate of sodium added does not prevent this in the cold, probably from not being decomposed by the sulphuric acid set free in such a dilute solution.

In one of the American Journals of Pharmacy, in an article on Syr. Ferri Quin. et Strych. Phosph. is a method for forming the solution of phosphate of iron at once, by adding superphosphate of calcium to the sulphate of iron, thus obtaining phosphate of iron in solution, and sulphate of calcium precipitated. This process embodies the idea of Mr. Wood, in preparing syrup of hypophosphite of iron, viz. precipitating sulphate of iron with hypophosphite of calcium in presence of dilute phosphoric acid. This method would probably give excellent results with Syr. Ferri Phosph. To preserve the syrup from change, the best method is to completely fill small bottles and use good corks. Light does not appear to have any effect upon it.

The principal cause of the discoloration of the syrup is probably nitrous compounds in the phosphoric acid, and by using acid prepared by myself, a syrup was obtained which kept better than any previously made. In preparing the acid, Professor Attfield's modification of the Pharmacopœia process gives good results; it consists in the use of a flask instead of a retort, having a large funnel placed in the neck, in which is inverted a smaller one.

In preparing syrup of iodide of iron, small wrought-iron tacks may be used instead of iron wire with advantage. They are more convenient to use, and will keep any length of time in a dry place without rusting, and are almost as pure, a sample analysed containing 99·1439 of pure iron.

If instead of using 3 oz. of water, 2 only are employed at first, there is no necessity for heating. Another advantage in using less water is, that there is one ounce more to dissolve the sugar to form the syrup. Probably a reduction in the quantity of sugar would be an improvement, as after standing a few days, sugar crystallizes out. To preserve this syrup many suggestions have been made, some involving unjustifiable additions, such as citric, sulphuric, or phosphoric acid. No difficulty is experienced if the syrup be kept in small, well-corked bottles. Light also appears to have no action on this syrup.

A short discussion followed, in which the PRESIDENT and Messrs. SHAW and DAVIES joined, after which, a unanimous vote of thanks was passed to Mr. Tanner.

MANCHESTER CHEMISTS AND DRUGGISTS' ASSOCIATION.

The Third Monthly Meeting was held at Union Chambers, 15, Dickenson Street, on Friday, February 5th,—Mr. Brown, Vice-President, in the chair. Mr. Hampson read a paper on "The Question of Remunerative and Uniform Prices." At its conclusion a

vote of thanks was passed to the author, and he was requested to allow the paper to be printed *in extenso*.*

The Fourth Monthly Meeting was held at the Union Chambers on Friday evening, March 5th, Mr. Brown, Vice-President, in the chair. A donation of the 'Pharmaceutical Journal' from the Society was announced. It was the intention of the Council to have submitted on this occasion for approval and discussion, the Dispensing Price List prepared by the sub-Committee. Mr. Brown having made some remarks respecting the proposed scale, and the lively interest shown in connection with it, and the importance of having it thoroughly discussed and unanimously adopted, it was proposed by Mr. Mitchell, and carried, that a special meeting be called for the 19th instant for the purpose.

Mr. F. B. Benger (Hon. Sec.) then read a very interesting paper "On some of the Effects and Applications of Current Electricity." Referring to the accidental discovery of current electricity by the pupil of Galvani, he glanced at the various wonderful discoveries proceeding from this simple origin. In illustrating the subject, which he presented in an exceedingly lucid and pleasing manner, he displayed by means of a very valuable selection of apparatus, many of the most striking phenomena of dynamic electricity. The following may be mentioned:—the suspension of a heavy weight by induced magnetism; the action of various contact breakers, and their application to machinery and the telegraph, etc.; experiments with the induction coil, its construction and utility; the electrolysis of water; the electric light; and lastly, a brilliant display of Geissler's vacuum tubes. The reading of the paper was listened to with evident pleasure and interest, and at its close a unanimous vote of thanks was passed for Mr. Benger's instructive paper and experiments. The April meeting will be held at 3 P.M. on Friday the 2nd inst. Subject: "Spectrum Analysis," by Mr. T. T. Slugg, F.R.A.S.

MEETING OF CHEMISTS AND DRUGGISTS IN NEWCASTLE.

A meeting of chemists and druggists was held March 8th, in the lecture theatre of the College of Medicine, Newcastle. Mr. SWAN took the chair.

Mr. BARNARD S. PROCTOR (the Secretary) read the report, of which the following is an abstract:—Your committee have to report that they communicated to the secretary of the College of Medicine the proceedings of the meeting, at which they were appointed, and in reply they were informed that the college had appointed a sub-committee to receive your deputation. A meeting of the two committees was accordingly held on the 8th February, 1869. At this meeting your committee felt that the object in view would be promoted rather by a free and friendly interchange of opinions than by the submitting of any formal proposition. A general conversation ensued, in which many points of detail were considered. The proceedings of this meeting having been communicated to the college by their committee, they expressed their general concurrence with our views in their reply through the registrar, his letter stating that it would be better that pharmaceutical students should be educated in the College of Medicine than that a separate institution should be formed for the purpose; that they would add a course on practical pharmacy; that pharmacy-students would attend the present course on materia medica, including therapeutics; that courses on chemistry and pharmacy would be delivered in the winter session, and botany and materia medica in the summer; and that the lecture hours would not be in the middle of the day; that a lecturer on pharmacy would be appointed according to the rules and constitution of the college; and that the payment of a composition fee of £6. 6*s*. would entitle the student to attend the above courses in any order and at any time till his examination should be passed; that the £6. 6*s*. fee being below the regular scale, was instituted for the benefit of those who were engaged in the business before the passing of the Act, and would only apply to those who might enter within two years.

There are only two points in this letter upon which your committee feel it necessary

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* This paper has been published, and may be obtained by sending a stamped directed envelope to F. B. Benger, Hon. Sec., 1, Market Place, Manchester.

to offer any explanatory remarks. First, with regard to the retention of therapeutics as a part of the materia medica course, the suggestion of its withdrawal was made mainly with the desire of showing our wish to avoid even the appearance of encroaching upon the province of the medical practitioner. Any information upon the application of medicines to the cure of disease will always be acceptable, inasmuch as it adds to the intelligence with which the pharmaceutist pursues his calling. The second point is clause 6, in reference to which it is only necessary to add that while the college express their willingness to contribute to the preliminary expenses, they naturally avoid making themselves liable for any extravagant expenditure for apparatus, etc., should such be incurred by the lecturer. Any contributions either from the college or the master druggists would, of course, be purely voluntary, and not necessarily of large amount. The council of the college having thus acceded to your request in every particular, your committee earnestly recommend that you give the matter your cordial support, by affording every facility and encouragement to your young men to avail themselves of the courses of lectures which are thus about to be instituted for their benefit. In conclusion, your committee congratulate you upon the success of the first step towards the important object in view, and express their confident hope that you have given the initiative to the establishment of a Faculty of Pharmacy, which will be a worthy associate of the many noble institutions with which we are surrounded.

The CHAIRMAN moved the adoption of the report.

Mr. BRADY, in seconding the adoption of the report, dwelt at some length on the circumstances which had led to the proposals contained in it, and urged all present to take up the matter energetically. Those who were in the position of masters would have to make sacrifices not less in point of pecuniary value than the cost of fees and materials for study that would fall upon the young men whom they employed. There was probably no one present who would object to liberating some of his assistants at such times as might be requisite for the attendance of lectures, and if need be, even to help them with funds for the purpose. The assistants and apprentices would see that though the fees appeared a little larger than those adopted by some provincial pharmaceutical classes, the sort of instruction provided was very different; in fact, that the sum proposed for the perpetual tickets was an exceedingly small one for the advantages secured by it. The Committee had, as he thought, wisely adopted an arrangement which would tend rather towards the thorough qualification of the students, than one which would be likely to encourage them to acquire a mere smattering such as might enable them to pass "Modified" examinations. After some remarks on the altered relation of masters to their apprentices, and the effects that might be looked for if these were accepted in a right spirit, he concluded by urging the hearty adoption of the various clauses contained in the report which had been submitted to the meeting.

The adoption of the report was carried.

Mr. W. PROCTOR characterized the arrangement made by the College of Medicine as liberal. He moved "that the Committee be requested to continue their services; that they draw up a reply to the communication from the college in accordance with the views which have been expressed at this meeting."

Mr. A. HUME seconded the motion, which was carried.

The CHAIRMAN said they could not but feel satisfied at the result they had arrived at. He moved that the thanks of the meeting be given to the Council for the loan of the room.

Mr. JOSEPH FAIRS seconded the motion, which was agreed to.

A vote of thanks to the Chairman terminated the proceedings.

At the conclusion of the meeting a list of students was commenced, and eleven names entered.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

At a meeting of this Society, Friday, Feb. 12th, the President delivered the inaugural address. After returning thanks for the honour they had done him in electing him as their President, and pledging himself to endeavour, to the best of his ability, to discharge the duties of the office to the benefit of the Society and to the furtherance of pharmaceutical education, he alluded to the fact that they were there for the purpose of

furthering local organization and educational improvement. He thought they might congratulate themselves that pharmacy had at last received that recognition from the country to which it was so justly entitled; and for which its followers had so long struggled. The most strenuous exertions of the Council of the Pharmaceutical Society had been put forth, and were at length crowned with success. The thanks of the whole body of Chemists and Druggists, of the medical profession, and the public, were due to them, and especially to the President and the Secretary. He was glad to find that a testimonial of a personal and commemorative character was about to be presented to the President, in acknowledgment of his services, but he felt sure that *his* greatest reward was the honour and respect he had obtained from his brethren.

The passing of the Pharmacy Act seemed to have aroused the slumbering energies of chemists throughout the country. Educational societies were being formed in most large towns, and he was proud to think that Nottingham was *not* behindhand.

He proceeded to explain the objects and scope of the Association. The first important object they had was to establish evening meetings. It was proposed to hold them monthly at first, and at such an hour as would best suit the convenience of their members; they would be occasions when they would have an opportunity of becoming better acquainted with one another. They must not look upon them as scientific and formal, but as periods for social and friendly conversation, in which all may join without fear of unnecessarily exposing their ignorance. The very aim and intention of these meetings was mutual improvement; they did not commence as a scientific body, but humbly, as students with a desire for knowledge. At these monthly meetings short papers would be read, appropriate and interesting objects exhibited and explained, and an opportunity for conversation and discussion afforded; and as to the nature of the papers, these might comprise the Pharmacy Act and its various provisions, the British Pharmacopœia, new medicines and new processes, improvements in old forms, methods of testing the strength of medicines and detecting adulterations.

A regular system of testing the purity and strength of the medicines they dispensed would be of immense service, not only tending to the general improvement of their position, to the satisfaction of the medical profession, and to the general good of the public,—but affording a moral satisfaction in the thought that they had a higher principle to be guided by than mere pounds, shillings, and pence.

A few short papers from their members and associates on any of these subjects each evening, if only of a few minutes' duration, would be really more interesting and serviceable, as a rule, than longer and more elaborate papers of less practical interest. There was one faculty they all possessed to a greater or less degree, and that was the power of observation; let them properly cultivate that power.

He much wished to press this point strongly on their minds,—they *must support* these evening meetings; he believed the very existence of the Society depended upon their attendance.

He wished, in the next place, to direct their attention to the means by which their apprentices and assistants were to be enabled to prepare for the examinations they would have to pass. It was their intention to have lectures at different times on chemistry, pharmacy, materia medica, and perhaps botany. They proposed to have two educational courses in the year, and to admit any associate of the Society to them on payment of a mere nominal fee. Arrangements were nearly completed for the formation of a Latin class for juniors, both assistants and apprentices, with more especial reference to the proper reading of prescriptions and the proper terminations of the words used. Next October they would have a course of lectures on chemistry.

But they would be only half doing the work if they confined themselves to providing lectures. There would be little use in a young man's attending lectures if he could not solidify and extend the information so obtained by reading at home. It was, therefore, one of the objects of their Association to establish a library.

Reference was made to the "Petroleum Act," more particularly to the ambiguity of some of its provisions. The subject of our relation to the medical profession, and as arising therefrom, the evil of "counter practice," were touched upon. The "decrease of pharmaceutical remuneration in comparison with our increased education" was dwelt on at some length, and he observed:—We are all unfortunately aware of the cause, and we all know full well the remedy for our malady. So long as it is the practice of the medical profession to dispense their own medicines, and so long as it is the

practice of the profession to contract with a chemist to dispense for him at a ruinous price, whereby the surgeon gets all the profit and the chemist all the work, so long will our proper professional remuneration be inadequate to our responsibility and education.

Reference was also made to the practice of modern growth of prescribing concentrated medicines. It was no advantage to the prescriber, an injustice to the dispenser, and a positive injury to the patient.

Lastly, an appeal was made to the younger portion of those present. He said,—

I am fully aware that, in provincial towns, young men have not the same opportunities and facilities for study as in London and some of our larger provincial towns, like Liverpool and Manchester. It is the aim and duty of a society like ours to compensate for this deficiency as much as possible, by the formation of classes and the institution of lectures on those subjects which will best prepare you for those examinations.

I have previously spoken of *our* responsibilities as masters. They have responded to the call, and, I am sure, are prepared to do their duty to you ; and I am sure it will be a pleasure to them to give you every opportunity of embracing the opportunities for instruction afforded by the Society. You, as our assistants and apprentices, have an equal responsibility to avail yourselves fully of the advantages offered. Upon you devolves the task of sustaining the new character which we have but now assumed. It is to your energy, intelligence, and increased education, that we look for a justification of the efforts of the Pharmaceutical Society and Parliament in giving professional standing to our body. It is to you that we look for an elevation of the practice in Pharmacy in England which will place us in as good a position as pharmaciens in Paris and pharmaceutists in other countries.

To those of you who are preparing to present yourselves for the Modified Examination, I would say, the examinations are almost exclusively confined to your ordinary work in the shop and the dispensing counter. If a man is intelligent and exhibits common sense during his examination, even if his answers are not quite up to the mark, I know enough of the examinations and the examiners to be able to speak positively that his case will receive favourable consideration. There is nothing in the examination that an assistant ought not to be conversant with before undertaking the duties of the dispensing counter.

As regards apprentices, who have to pass, in due time, the regular Minor Examination, I hope to have another opportunity of speaking to them on the subject ; but, in the meantime, would commend to them habits of observation ; know by sight, smell, and other physical characteristics, every drug, chemical, and pharmaceutical preparation in the shop ; cultivate habits of inquiry ; be diligent in your work, and, as you make a good apprentice, so shall you make a good and successful master.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL ASSOCIATION.

The second monthly meeting was held in the rooms of the Society Music Hall, on Wednesday evening, March 10, when Mr. G. A. Cubley read a paper on "Payment for Ability and Responsibility, not for Material."

The subject was well defined and ably handled, and led to a very interesting discussion on the charges made for medicines prepared from physicians' prescriptions.

A unanimous vote of thanks was accorded to Mr. Cubley for his valuable paper.

The secretary afterwards announced the donations to the museum and library, and votes of thanks were passed to the contributors.

It was further announced that £20 had been already contributed by members in Sheffield towards furnishing the rooms ; and that it was the intention of the council to open them a few nights a week, and to supply trade journals and other periodicals.
is also contemplated to have a regular course of lectures given to the young men of the profession, so that they may have an opportunity of preparing themselves for the examinations rendered necessary by the "Pharmacy Act of 1868."

SUNDERLAND CHEMISTS' ASSOCIATION.

At a meeting of Chemists and Druggists, held on Wednesday, March 17th, at the Crown and Sceptre Hotel, HARRISON THOMPSON, Esq., in the chair, it was resolved:—

"That, in consequence of the change made in our business by the passing of the new Pharmacy Act, our increased duties and responsibilities, it is desirable to establish a local Society, to be called the Sunderland Chemists' Association, to consist of all the Chemists and Druggists of the town and neighbourhood, and to hold periodical meetings for the purpose of taking into consideration the means of raising the standard of education and scientific knowledge to the point required by our present improved position, and discussing such business matters as may from time to time arise."

A Committee, consisting of Mr. H. Thompson (Chairman), Mr. D. B. Sharpe, Mr. R. Robinson, and Mr. J. J. Nicholson (Hon. Sec.), was appointed to take immediate steps for carrying the resolutions into effect with as little delay as possible.

WEDNESBURY CHEMISTS AND DRUGGISTS' ASSOCIATION.

An adjourned meeting of the chemists and druggists of the borough of Wednesbury was held on Thursday evening, at the Turk's Head Hotel, to take into further consideration the desirability of establishing an association of the chemists of the borough "for the better regulation of the trade, to reduce the hours of labour, and to establish a library and classes for the members, apprentices, and assistants." Present, Messrs. Briggs, Horton, Nicklin, Harvey, Swinnerton, Gittoes, Butler, Ryley, Tomlinson. Letters of apology from several others for inability to be present were also read. Mr. Briggs, of Tipton, occupied the chair, and Mr. Hollier, of Dudley, the local Secretary of the Pharmaceutical Society for the district, attended by invitation. The Chairman remarked that this was the third meeting which had been held for the purpose of considering the objects stated in the circular, the others being somewhat of a preliminary character; as this was intended for business, he was sorry there were not more present. They had the pleasure that evening of seeing Mr. Hollier, the Local Secretary of the Pharmaceutical Society there, and he would, doubtless, be able to assist by his advice and suggestions in the promotion of their undertaking, and say, as to whether the Society itself could in any way help them. Mr. Harvey, the honorary secretary, *pro tem.*, stated that with Mr. Horton they had called upon nearly every chemist in the borough, and they were almost unanimous in favour of the formation of such an association. Unfortunately they had as yet not been able to get any large number present at their meetings, so that consequently they had not been able to proceed further than to meet in a friendly, social manner, and discuss as to the most advisable plan of proceeding for this purpose. They had invited two or three gentlemen to attend their meeting that evening, one of whom he was glad to see present. Mr. Hollier, having been then called upon, congratulated the chemists of the borough upon the attempt to form such an association. If it did nothing more, it would have had the effect of having brought them socially together, and of thus having made them know each other better, and so doing away with many of the petty rivalries and little jealousies which only too often arise from misunderstandings and misconceptions. By the passing of the recent Pharmacy Act a new era was about to begin as regarded their trade, and although they would have to wait for the results to be apparent, it was a step in the right direction to see the older members trying to adapt themselves to these altered circumstances, and to lend a helping hand to the juniors, who must prepare themselves by study for the passing of the examinations, which were now required before they would be permitted to begin business. As to their Association, it appeared there were two or three courses open for them, either to confine its operations to Wednesbury proper, to extend them to the whole of their borough, comprising West Bromwich, Darlaston, Tipton, and the populous districts of Great Bridge, Princes End, etc., or, having initiated the movement, to try that they should embrace the South Staffordshire district. Such an association would be extremely valuable for defensive as well as educational purposes, and as union is strength, so would it be also advantageous. Mr. Hollier suggested that they should proceed either by obtaining the signatures of all or as many of the chemists as possible in the borough in

favour of their proceedings, to hold meetings in its other localities, so as to enlist the more active sympathy and co-operation of those in business in such places, and, obtaining these, to call another general meeting for the purpose of drawing up the rules and transacting the necessary preliminaries of fully starting the Association. As far as he was concerned, he would be but too happy to render all the assistance in his power, and he thought he might safely venture to say that they would have the fullest sympathy of the Council of the Pharmaceutical Society. He could not say or see how far it could render any active support, but if this could be consistently done, they might fully hope for it. After an interesting discussion, in which the Chairman, Messrs. Harvey, Gittoes, and others took part, it was resolved to hold an early meeting at West Bromwich, in order to ascertain the feelings and opinions of the chemists and druggists of that place as to the formation of, and support which they would give to, the Association. After a vote of thanks to Mr. Hollier and the Chairman, it was left with Messrs. Horton and Harvey to take any steps they considered proper for the holding of the meeting at West Bromwich, and that they should, at their discretion, invite any other gentleman to attend whose presence would give weight and interest to the meeting.

ORIGINAL AND EXTRACTED ARTICLES.

THE PETROLEUM ACT.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—I beg to enclose a copy of a letter which I have received from the Under-Secretary of State with reference to the hardship inflicted upon me, as the manufacturer of Benzine Collas, and upon the retail Chemists and Druggists generally, by the "Petroleum Act, 1868." Mr. Liddell's letter will give great satisfaction to all parties concerned, and in particular to the President and Members of the Council of the Pharmaceutical Society, who so kindly and cordially assisted me in bringing the matter under the notice of the Secretary of State. I need not further allude to the deputation which they formed to wait upon Mr. Liddell, than to point out to those of your readers who may not have observed it, that an interesting account of the interview is contained in your last number, which appeared, however, before the letter from the Home Office reached me.

Will you permit me, in conclusion, to express a hope that the Chemists and Druggists throughout the country will comply with the requirements of the Act, as long as it remains in force, there being now every reason to hope that the desired amendment will be speedily obtained.

I am, Sir, yours obediently,

Brentford, March 18, 1869. E. THOMAS.

From the Under-Secretary of State to Mr. Thomas, the Proprietor of the Benzine Collas.

"*Whitehall*, 2 *March*, 1869.

"Sir,—I am directed by Mr. Secretary Bruce to acknowledge the receipt of your letter of the 27th ultimo, and to inform you that a short Bill will be introduced into Parliament to remove the grievance of which you complain.

"I am, Sir, your obedient servant,

"Mr. E. Thomas, *Brentford*." "A. F. O. LIDDELL.

THE LIGNALOE-WOOD OF MEXICO.

BY JAMES COLLINS (CURATOR OF THE MUSEUM).

Among recent donations to the Museum of the Pharmaceutical Society, recorded in the November number of this Journal, are specimens of a wood

called *Lign Aloe*, and of an essential oil distilled from it. As many inquiries have been made respecting these substances, a short account of them may prove acceptable.

At the outset I may state that the wood and oil in question have been imported from Vera Cruz, in Mexico, the tree itself growing near the city of Colima, capital of the State of that name, and therefore have not the slightest claim to be regarded as the true Lign Aloes of the Bible, now well known to be the produce of *Aquilaria Agallocha*, Roxb., a tree of South-Eastern Asia.

The specimens of the Mexican Lignaloe above referred to are portions of this recent importation. The oil was first offered up for public sale in 1867 by Messrs. Sargant and Son, Drug Brokers, of Mincing Lane, London, the wood being disposed of by private contract, at a much later date.

The wood which was brought over in the form of squared logs consists of a central portion of irregular outline, and of a pale ferruginous-brown, surrounded with wavy, darker band-like markings, while the contiguous outer portion (not merely alburnum) is of a dull iron-grey. The first named may have been living wood when the tree was felled, while the second had probably long lost its vitality.

Both the wood and even twigs of the tree are rich in an essential oil, of a lemon-like odour.

This remarkable Mexican wood has already attracted the attention of pharmacologists. Guibourt, in his 'Histoire des Drogues,' iii. 491, notices it under the name of *Bois de Citron du Mexique*, in terms which may be thus translated:—

> This wood bears in Mexico the name of *Lignaloe*. Deceived by this name, a French trader, several years ago, brought a somewhat large quantity to Bordeaux, and was greatly disappointed that no one was willing to purchase it from him at the price of 18 or 20 francs the kilogramme. This wood should nevertheless have a certain value for perfumery. It is internally white, with very irregular, slightly brownish longitudinal veins. It is very light and porous, and has a very strong odour of citron. It contains so great a quantity of essential oil, that one would say that it had been impregnated with it by immersion. This essence condenses in drops against the sides of the jar containing the wood, and entirely soaks the card label placed with it. A description of the wood, attributing it to an *Amyris*, may be found in a small work entitled 'Ensayo para la Materia Médica Mexicana,' published at Puebla in 1832.

A copy of the work to which M. Guibourt refers is in the library of Mr. D. Hanbury, to whom I am indebted for a sight of it as well as for the following translation of the passage alluded to:—

> *Lignoaloe* or *Linanue* (*Amyris?*) is produced in abundance in the Misteca and meridian of Matamoras. From the information I have been able to obtain respecting this plant, and some seeds of it I have received, there is great probability that it belongs to the genus above referred to. Its wood is light, of a yellow colour, more or less marked with veins of the same hue, of a very aromatic odour, especially when rasped or reduced to chips, resembling Rhodium wood, for which it is commonly substituted in the shops. Its volatile oil has a moderately agreeable smell, on account of which it is used in perfumes.

A little further information on the same subject is imparted by the German traveller Heller, who, in the supplement to his volume of 'Travels in Mexico,' enumerates various medicinal plants indigenous to that country, and among them the following:—

> *Amyris Tecomaca*, DC. (*A. maritima*, Moç. et Sess.), and *A. ambrosiaca*, Moç. et Sess. (*Icica serrata*, DC.).
>
> [Translation.]—*Lignaloe* or *Linanue* of the Mexicans, affords a volatile oil used

as a perfume which appears to be more abundant in the second species than in the first. I observed both kinds under this trivial name in the herbarium of the Botanic Garden at Mexico. The balsam of the *Burseraceæ* has similar properties to that of Copaiba, and is sometimes employed for the same purposes.*

When first the Lignaloe oil appeared in the English market, doubts were entertained as to its being a genuine production. Some amount of obscurity also seems to have surrounded its geographical source. In consequence of this, a request was made through the importers for some of the wood to be sent from Mexico, so that the oil could be extracted in this country. This request, as stated above, was complied with. In order, however, to place the matter beyond all dispute, Messrs. Riensch, Schmilinsky, and Schacht, the agents at Colima, applied to Señor Francis Gómez Palencia, the Secretary to the Government, to certify officially as to the genuineness of the Lignaloe oil as manufactured by Don Adolphus Langhoff, and also as to the tree from which the essence was obtained, and its habitat. This was granted, and Augustus Morrill, Esq., American Vice-Consul at Manzanilla, on the coast of Colima, attested Señor Palencia's signature. For the original documents, which are now before me, I am indebted to the courtesy of Messrs. Fesser, Uhthoff, and Co., Merchants, of Leadenhall Street, London. They are in Spanish, and may be rendered thus :—

(1.)

[Translation.]—To the Secretary of the Government of the State of Colima.

Sir,—Wishing to prove in the markets of Europe that the essence of "Lignaloe," which Señor Don Adolphus Langhoff extracts in the establishment which we founded in the year 1863 in the house opposite to those occupied by the Government offices, is veritable and the original product of the fruit and wood of the Linaloe-tree which grows in the mountains of this valley of Colima and the immediate neighbourhood,—we beg you to certify the truth of this document by your signature and the seal of the department under your worthy charge.

(Signed) Riensch, Schmilinsky, and Schacht.

(2.)

[Translation.]—Francis Gómez Palencia, Secretary of the Government of the State of Colima.

I certify that the essence of "Linaloe," which is produced by Señor Don Adolphus Langhoff, in the manufactory which was founded in this capital by Señores Riensch, Schmilinsky, and Schacht, is extracted from and is the original product of the fruit and wood of the "Linaloe"-tree which grows in the mountains of this State.

Colima, April 23rd, 1868.

(Signed) Fco. Gómez Palencia, Secretary.

Government Stamp of Colima.

(3.)

Consulate of the United States at Manzanillo, April 27th, 1868.

I, Augustus Morrill, Vice-Consul at Manzanillo, do hereby certify, that the signature of D. Francisco Gómez Palencia, at the foot of the paper hereunto annexed, is his true and genuine signature, and as such entitled to faith and credit.

In witness whereof I have hereunto set my hand and affixed the seal of this consulate, the day and year above written.

(Signed) Augustus Morrill, U.S. Vice-Consul.

Consulate, U.S.A., Manzanillo.

Accompanying these documents was a tin box, labelled "leaves and flowers of Lignaloe." Unfortunately, however, they were but a few scanty leaves, much broken, and without flowers or fruit. These leaves are imparipinnate, and

* 'Reisen in Mexiko in den Jahren 1845–48, von Bartholomæus Heller.' Leipsig, 1853, p. 426.

the leaflets smooth, very slightly petiolate, ovate with a crenate margin, the crenations being larger at the apex, and ceasing towards the base, and about an inch and a half long, the terminal one being the largest. These I have compared with the two species of *Amyris* notified by Heller, as yielding the Lignaloe oil, but they do not agree. They are, however, clearly those of a species of *Elaphrium* (Bursera), and M. U. Baillon, to whom Professor Oliver, of Kew, referred them, remarks that they have the appearance of those of *E. graveolens*, of Kunth. I trust, however, before long to obtain flowering specimens of the tree or trees, and as soon as they have been determined, to communicate the result.

DESTRUCTIVE EXPLOSION OF PICRATE OF POTASH IN PARIS.

An explosion of a most disastrous character occurred in Paris on Tuesday, the 16th of March, in the laboratory of M. Fontaine, manufacturing chemist, the successor of Messrs. Robiquet and Pelletier. It appears, from what is known on the subject, that a quantity, equal to about 56 lbs., of picrate of potash was being packed for transmission to Toulon, to be used in charging marine torpedoes, when, from some unknown cause, an explosion took place which destroyed the premises, and caused also destruction of human life, instantly killing all those who were present, and who might have explained the particular circumstances of the case.

The explosive compound which occasioned this great calamity was a salt of picric acid, which has frequently been used as a dye, imparting a yellow colour to silk or wool without requiring any mordant or previous preparation of the fabric to be dyed.

It has long been known that the salts of picric acid are explosive, the acid itself being a compound having a similar constitution to gun-cotton, and being usually made by the action of nitric acid on carbolic acid. Some years ago a factory in Berlin was destroyed, and three men killed, by the explosion of 40 lbs. of picrate of soda. This salt is said to explode with four times the force of gunpowder.

The application of salts of picric acid for the production of implements of war appears to have been of recent date, and the terrific nature of the explosion which has now occurred in Paris fully justifies the opinion formed of their applicability for that purpose. It is stated that a few pounds of picrate of potash, enclosed in a torpedo, explodes with sufficient violence to destroy an iron-clad frigate. The order that was being executed by M. Fontaine was received from the Minister of Marine; and it is surprising that the Government, knowing the dangerous nature of the material, should have allowed such an order to be executed in Paris, where an accident could hardly fail to prove fatal to many persons. The victims on this occasion were M. Fontaine's son, M. Bal, a chemist, and two other persons employed in the establishment, but besides these, most of whom were literally blown to atoms, there were several other persons more or less seriously injured, and a great deal of property destroyed or damaged.

REMARKS ON M. SCHÖNBEIN'S TEST FOR HYDROCYANIC ACID.

BY MR. GEORGE WELBORN.

I have made some experiments with papers, prepared according to M. Schön-

bein's directions, for detecting the presence of minute quantities of hydrocyanic acid, as described in the Journal for January last ; but the results do not confirm the statement therein contained.

It is quite true that the test-papers are exceedingly sensitive to the presence of hydrocyanic acid vapour ; but unfortunately for the value of the reaction as a proof of the presence of hydrocyanic acid, they are equally sensitive to the action of chlorine, and, in a less degree, to that of the vapours of several other substances.

1st. One drop of Scheele's acid was dropped into a bottle of 80 fluid ounces capacity, and the test-paper being suspended in it, began to assume the blue tint instantly, rapidly becoming deeper in colour.

2nd. A trace of chlorine gas gave an immediate coloration, soon becoming deep blue.

3rd. Five drops of strong nitric acid were dropped in ; in $1\frac{1}{2}$ minute the coloration had commenced, slowly changing to a deeper tint.

The following substances gave no reaction :—hydrochloric acid gas, acetic acid vapour, and sulphuric dioxide.

CONSEQUENCES.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—Those who accomplished the feat of shooting the Niagara of pharmacy half a year since, may now consider the consequences of that leap. Firstly, let us realize that we have reached and passed what was for a quarter of a century the goal of our aspirations. We must for the future be attracted by new hopes and aims, and shall find ourselves brought under new influences on all sides. But we have everything to hope and nothing to fear, because the principle of self-government has been so amply vindicated in the final settlement of the "Pharmacy Act (1868)." Had our interests depended on the caprice of a Government official, or had the election of the Council been subject to unjust limitations, we might have stood aside with a feeling of helpless indifference. But now the Council ought in practice to represent what it does in theory, viz. the sentiments of our body at large. But to bring the actions of the Council into accord with the sentiments of its constituency, it is evident that we must know much more of the opinions and tendencies of individual members of Council than is the case at present, and that the Council, as such, must act in the light instead of in the dark.

The indiscriminate publication of all that occurred at meetings of the Council would not be proposed by any reasonable man ; but the new fact that the Council of the Pharmaceutical Society holds, on behalf of the State, the control of pharmacy in Great Britain, justifies the demand that the deliberations of that body shall be consistent with the spirit of our national institutions. The General Medical Council has had to open its doors to the press, and probably would not recur to the old system, even were it possible.

It is evident that some evils might be promoted by the injudicious application of the principle of publicity ; one of the most apparent being the encouragement of possible demagogues, talking for notoriety. Even this evil would not be a fatal one, and it is by no means certain that such efforts to please the lieges would succeed ; but they would prove futile under the system of *regulated publicity* for the acts of members of Council which I advocate. Will some of our representatives favour us with their opinions on the question ?

Another consequence of the "Pharmacy Act" appears to me to be this. Many members have wished for local examinations, and only desisted in their advo-

cacy of the principle because of the general question of pending legislation. Now, the necessity of the case is much modified; and it is not needful as a question of obtaining members that the Society should increase the facilities for entrance. All *must* present themselves for examination, although it will still be proper to afford every reasonable facility for doing this. But if not disposed to insist on the immediate necessity of local examinations, I feel that there is a want of a most pressing character, viz. the means of local education. That Bloomsbury Square will continue full to overflowing, as at present, and will attract the *élite* of the pharmaceutical students of the kingdom, may be safely assumed.

But this does not account for more than a tithe of the students who must annually offer themselves for the Minor and Major Examinations; and provincial schools of pharmacy for our leading centres of population are evidently a necessity. Now I wish to claim for such efforts the countenance and support of the Council, conveyed in such a way as may meet the special requirements of the case. It is evident that local interest and support must form the nuclei of any new schools, and I claim that wherever these may develope a complete scheme of efficient pharmaceutical education in the provinces, they shall be subsidized and supplemented by the Society, upon the same principle that induced it to spend money for years upon the school at Bloomsbury Square, and to give a student for £30 an education costing £60 or more. The science-teaching of the country is encouraged by Government upon a principle similar to this, by capitation grants, payments for results, prizes, scholarships, contributions of 50 per cent. towards the cost of apparatus, etc. Let the principle be granted, and the financial question will not be difficult. Our Society had £4600 of invested property on account of its general fund a year since, and certainly it is no duty of ours to lay up this money for posterity. Such a bold and comprehensive scheme as that set on foot by our brethren at Newcastle-on-Tyne well deserves the support to which I am alluding, even though we may regard it as an experiment. Again I would ask, what say our representatives?

Yours respectfully,

RICHARD REYNOLDS.

Leeds, March 19, 1869.

PRESERVATION OF HERBS, ETC.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—Dr. Attfield refers to a mode adopted by Mr. Holloway, of Sydenham, for keeping powdered herbs, etc. I used the plan proposed, many years since, to preserve powdered foxglove, which was being much used both in medical and veterinary practice.

It was found that towards the end of a year (after gathering) the leaves became comparatively inert, and I adopted the plan the following year of powdering at once the *whole year's supply* of foxglove, and putting it into wide-mouthed stoppered bottles, with just enough rectified spirit to make the powder sensibly damp, but not at all approaching *wetness;* this takes about 10 per cent. of spirit. The process seemed to answer thoroughly. If the foxglove is afterwards wanted in very dry powder, drive off the spirit with a gentle heat; if for tincture, it is always ready with 10 per cent. of spirit already mixed, although this needs not to be taken into consideration. Under no circumstances should so much spirit be put as to allow of any subsidence.

My experience is that there are very few leaves and herbs that are thoroughly satisfactory a few months after gathering, if kept in the ordinary way. If the plants were dried rapidly at a moderate heat, say 80° to 90°, and at once

powdered and kept in the manner above described, I believe there would be much more certainty in administering the preparations made from them. I entirely omit from this consideration the question as to what deterioration plants undergo by drying at all: that *some*, at all events, do suffer seriously, I think cannot be disputed, as the *Ranunculus acris* proves; which, when eaten *fresh* by cattle produces poisonous effects, but when dried with hay is afterwards eaten with impunity.

One serious objection to the adoption of the above mode of preserving leaves, etc., is the fact that the great mass of chemists buy their henbane, foxglove, etc., of wholesale houses at all times of the year, as they require them; in such cases I question whether any good would be obtained by using the plan. The only alternative then is for wholesale houses to do it, or for country chemists who live in neighbourhoods where medicinal plants abound, to prepare them and supply to those who will buy them.

I am, yours,
T. M. Gissing.

EMPLASTRUM BELLADONNÆ, P.B.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—Sufficient time has now elapsed to enable all practical pharmaceutists to give their experience in making the preparations of the British Pharmacopœia. I shall feel much obliged if any of them will favour me, either by letter or through the Journal, with their observations upon the Emplastrum Belladonnæ.

1st. Does the quantity of extract taken up by the spirit vary at different times of the year?

2nd. Is it affected in colour or quantity by the use of methylated spirit? If so, in what way?

3rd. What is the average quantity taken up by the spirit?

I am, yours truly,
T. W. Gissing.

Wakefield, March 9, 1869.

NOTES AND ABSTRACTS IN CHEMISTRY AND PHARMACY.

BY C. H. WOOD, F.C.S.

A New Vacuum Apparatus. A Vacuum Filter.

In a recent number of this Journal an account was given of an article by Professor Bunsen, "On the Washing of Precipitates,"* in which reference was made to a new vacuum filter devised and employed by Bunsen for promoting rapid filtration. Although the apparatus was especially intended for filtration, it is equally applicable to evaporation and general chemical purposes. From its cheap and adaptable nature it is likely to find its way into every laboratory that possesses a good supply of water, and a sufficient height above the ground. It is, in fact, a simple modification of the well-known Sprengel air-pump, water being employed in the place of mercury. A stream of water, falling down a pipe thirty or forty feet in depth, sucks the air from any vessel communicating with the top of the pipe, and produces the vacuum. A rarefaction within a half or a quarter of an inch of mercurial pressure is easily obtained. The arrangement of the pump is shown in the figure.

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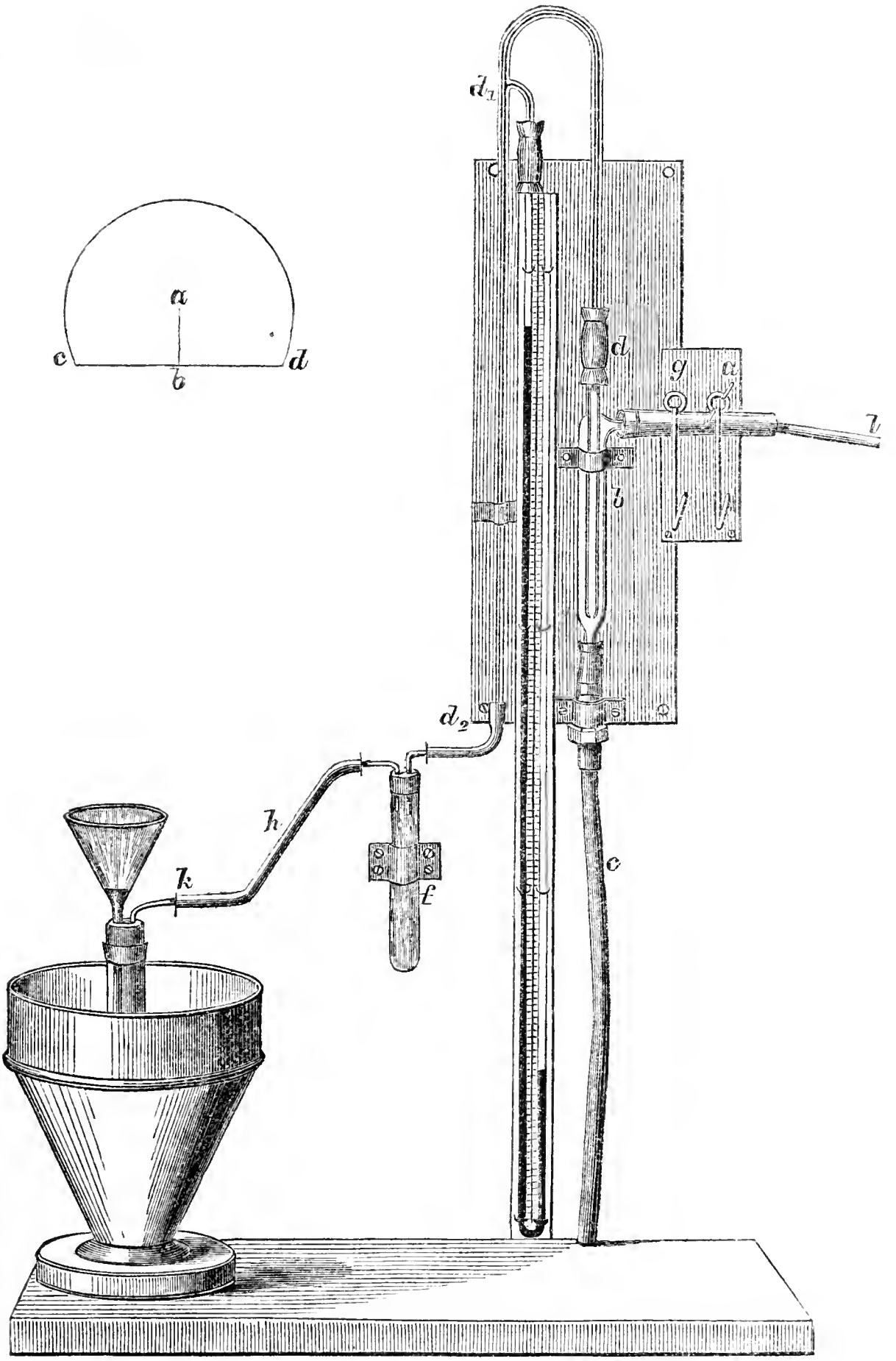
* Annalen der Chemie, and Phil. Mag., Jan. 1869.


a
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On opening the pinchcock *a*, water flows from the tube *l* into the enlarged glass vessel *b*, and thence down the leaden pipe *c*. This pipe has a diameter of about 8 millims. ($\frac{1}{3}$ in.), and extends downwards to a depth of 30 or 40 feet, and ends in a sewer or other arrangement serving to convey the water away. The lower end of the tube *d* possesses a narrow opening; it is hermetically sealed into the wider tube *b*, and reaches nearly to the bottom of the latter. A manometer is attached to the upper continuation of this tube *d* by means of a side tube at d^1; at d^2 is attached a strong thick caoutchouc tube possessing an internal diameter of 5 millims. ($\frac{2}{10}$ in.) and an external diameter of 12 millims. ($\frac{1}{2}$ in.); this leads to the flask which is to be rendered vacuous, and is connected with it by means of the short narrowed tube *k*. Between the air-pump and the flask is placed the small thick glass vessel *f*, in which, when one washes a filter with hot water, the steam which may be carried over is condensed. All the caoutchouc joinings are made with very thick tubing, the internal diameter of which amounts to about 5 millims. ($\frac{2}{10}$ in.), the external diameter to about 17 millims. ($\frac{3}{4}$ in.). The entire arrangement is screwed down upon a board fastened to the wall, in such a manner that each separate piece of the apparatus is held by a single fastening only, in order to prevent the tubes being strained and broken by the possible warping of the board. On releasing the pinchcock *a*, water flows from the conduit *l* down the tube *c* to a depth of more than 30 feet, carrying with it the air which it sucks through the small opening of the tube *d* in the form of a continuous stream of bubbles. No advantage is gained by increasing the rapidity of the flow, since the friction exerted by the water upon the sides of the leaden pipe acts directly as a counter-pressure, and a comparatively small increase in the rapidity of the flow is accompanied by a great increase in the amount of this friction. Accordingly at *g* is a second pinchcock, by which the stream can be once for all so regulated that, on completely opening the cock *a*, the friction, on account of the diminished rate of flow, is rendered sufficiently small to allow of the maximum degree of rarefaction. Such an apparatus, when properly regulated once for all by means of the cock *g*, exhausts in a comparatively short time the largest vessels to within a pressure of mercury equal to the tension of aqueous vapour at the temperature possessed by the stream.*

To employ this pump for rapid filtrations, it is necessary to devise such a support for a paper filter that it shall support the atmospheric pressure without any risk of breaking. Prof. Bunsen has solved this problem in a very simple manner.

An ordinary glass funnel has only to be so arranged that the filter can be completely adjusted to its sides even to the very apex of the cone. For this purpose a glass funnel is chosen possessing an angle of 60°, or as nearly 60° as possible, the walls of which must be completely free from inequalities of every description; and into it is placed a second funnel made of exceedingly thin platinum-foil, and the sides of which possess exactly the same inclination as those of the glass funnel. An ordinary paper filter is then introduced into this compound funnel in the usual manner; when carefully moistened and so adjusted that no air-bubbles are visible between it and the glass, this filter, when filled with a liquid, will support the pressure of an extra atmosphere without ever breaking.

The platinum funnel is easily made from thin platinum-foil in the following manner:—In the carefully chosen glass funnel is placed a *perfectly accurately fitting* filter made of writing-paper; this is kept in position by dropping a little

* The time required to obtain the above degree of exhaustion in a flask of from 1 to 3 litres capacity ranges from six to ten minutes; the quantity of water necessary amounts to about 40 or 50 litres.

melted sealing-wax between its upper edge and the glass; the paper is next saturated with oil and filled with liquid plaster of Paris, and before the mixture solidifies, a small wooden handle is placed in the centre. After an hour or so, the plaster cone with the adhering paper filter can be withdrawn by means of the handle from the funnel, to which it accurately corresponds. The paper on the outside of the cone is again covered with oil, and the whole carefully inserted into liquid plaster of Paris contained in a small crucible 4 or 5 centims. ($1\frac{1}{2}$ to 2 in.) in height. After the mixture has solidified, the cone may be easily withdrawn; the adhering paper filter is then detached, and any small pieces of paper still remaining removed by gently rubbing with the finger. In this manner a solid cone is obtained accurately fitting into a hollow cone, and of which the angle of inclination perfectly corresponds with that of the glass funnel.

By the help of these cones the small platinum funnel is made. A piece of platinum (Fig. 2 shows the natural size) is cut from foil of such a thickness that one square centimetre ($\frac{4}{10}$ in.) weighs about 0·154 grm. (2·4 grs.), and from the centre *a* a vertical incision is made by the scissors to the edge *c b d*. The small piece of foil is next rendered pliable by being heated to redness, and is placed upon the solid cone in such a manner that its centre *a* touches the apex of the latter; the sides *a*, *b*, *d* are then closely pressed upon the plaster, and the remaining portion of the platinum wrapped as equally and as closely as possible around the cone. On again heating the foil to redness, pressing it once more upon the cone, and inserting the whole into the hollow cone and turning it round once or twice under a gentle pressure, the proper shape is completed. The platinum funnel, which should not allow of the transmission of light through its extreme point, even now possesses such stability that it may be immediately employed for any purpose. If desired, it may be made still stronger by soldering down the overlapping portion in one spot only to the upper edge of the foil by means of a grain or two of gold and borax; in general, however, this precaution is unnecessary. If the shape has in any degree altered during this latter process, it is simply necessary to drop the platinum funnel into the hollow cone and then to insert the solid cone, when by one or two turns of the latter the proper form may be immediately restored. The platinum funnel is placed in the bottom of the glass funnel, the dry paper filter then introduced in the ordinary manner, moistened, and freed from all-adhering air-bubbles by pressure with the finger. A filter so arranged and in perfect contact with the glass, when filled with a liquid, will support the pressure of an entire atmosphere without the least danger of breaking; and the interspace between the folds of the platinum-foil is perfectly sufficient to allow of the passage of a continuous stream of water.

In order to be able to produce the additional pressure of an atmosphere, the filtered liquid is received in a strong glass flask instead of in beakers.* This flask is closed by means of a doubly perforated caoutchouc cork, through one of the holes of which the neck of the glass funnel is passed to a depth of *from* 5 *to* 8 *centimetres* (2 to 3 in.); through the other is fitted a narrow tube open at both ends, the lower end of which is brought *exactly to the level of the lower surface of the cork*, to the other is adapted the caoutchouc tube connected with the pump. The flasks are placed in a metallic or porcelain vessel, in the conical contraction of which several strips of cloth are fastened. This method of supporting the flask has the advantage that, in one and the same vessel, flasks varying in size from 0·5 to 2·5 litres stand equally well, and that, by simply laying a cloth over the mouth of the vessel, the consequences of an explosion (which through inexperience or carelessness is possible) are rendered harmless.

* These flasks must be somewhat thicker than those ordinarily used, in order to prevent the possibility of their giving way under the atmospheric pressure.

The filtration is made in the following manner:—The flask standing in the metallic or porcelain vessel is connected by means of the slightly drawn-out tube *k* with the caoutchouc tube *h* attached to the pump, the cock *a* having been previously opened and the properly fitted moistened filter filled with the liquid to be filtered. As usual, the clear supernatant fluid is first poured upon the filter; in a moment or two the filtrate runs through in a continuous stream, often so rapidly that one must hasten to keep up the supply of liquid, since it is advisable to maintain the filter as full as possible. After the precipitate has been entirely transferred, the filtrate passes through drop by drop, and the manometer not unfrequently now shows a pressure of an extra atmosphere. The filter may be filled (in fact, this is to be recommended) with the precipitate to within a millimetre of its edge, since the precipitate, in consequence of the high pressure to which it is subjected, becomes squeezed into a thin layer broken up by innumerable fissures. As soon as the liquid has passed through and the first traces of this breaking up become evident, the precipitate will be found to have been so firmly pressed upon the paper, that on cautiously pouring water over it it remains completely undisturbed. The washing is effected by carefully pouring water down the side of the funnel to within a centimetre *above* the rim of the filter: the washing-flask for this purpose is not applicable; the water must be poured from an open vessel. After the filter has in this manner been replenished four times with water and allowed to drain for a few minutes, it will be found to be already so far dried, in consequence of the high pressure to which it has been subjected, that without any further desiccation it may be withdrawn, together with the precipitate, from the funnel, and immediately ignited, with the precautions to be presently given, in the crucible.

The saving of time which may be effected in analytical operations by the employment of this apparatus, is very considerable. Even with the most refractory precipitate, such as hydrated oxide of chromium, complete washing may be effected in one-tenth part of the time usually required. Moreover, it is possible, in cases where it is necessary to calcine the precipitate, to omit altogether the usual drying in a water-bath or oven. From one to five minutes' draining in the funnel is quite sufficient. The portion of filter-paper free from precipitate is tightly wrapped round the remainder of the filter, and the whole cautiously carbonized in a platinum crucible, raising the heat towards the end.

The filter-pump, moreover, is exceedingly serviceable in separating precipitates or crystals from syrupy mother-liquors. Thus honey-sugar may be so completely separated from the thick viscid liquid in which it forms, by a filter of coarse grey paper, that it remains only slightly coloured, and by a single crystallization from alcohol may be obtained in small white shining needles. And since the bulk of the moist precipitates, particularly that of the more gelatinous, is so much diminished under the high pressure, the precipitate only occupying one-third to one-sixth of its bulk under ordinary circumstances, a filter of one-third to one-sixth of the size usually employed may be taken, and thus the amount of ash proportionately lessened.

As the water air-pump suffers no injury from the presence of corrosive vapours or gases, we can equally well employ it to filter liquids containing nitrous acid, sulphurous acid, fuming nitric acid, chlorine, bromine, volatile chlorides, etc.

In such cases Bunsen employs a cylindrical glass vessel, drawn out to a narrow tube at the lower end, in place of a funnel. In this drawn-out portion, a plate, one-twentieth of an inch in thickness, of *artificial* pumice, such as is used by polishers, is packed water-tight by means of asbestos. Upon such a filter, by means of the pump, crystals of chromic acid may be drained, then washed with a small quantity of fuming nitric acid free from nitrous acid, and perfectly dried by warming the tube, while a current of dry air is drawn through.

When the pump is employed for evaporation in vacuo, it is only necessary to introduce the liquid into the flask, to which a fresh caoutchouc cork is fitted, having only one perforation. The flask may be heated by standing it in warm water.

The cost of a single pump, including the leaden piping, is stated by Bunsen to be eight thalers, or twenty-four shillings.

ON LIQUID FUEL.

BY BENJAMIN H. PAUL, ESQ.

(*Concluded from page* 554.)

In order now to arrive at some estimate of the advantage to be gained in a steam vessel, either in point of weight to be carried, or space occupied by liquid fuel as compared with coal, it is evident that 100 tons of petroleum, or coal oil, would do the work of about 140 tons of good coal. But as coal is rarely burnt in such a way as to be rendered useful to its full capability, and as there is always a considerable waste in the shape of dust and cinders, which would not be the case with liquid fuel, a further allowance must be made for this. Assuming that one-fifth of the coal is wasted in this way, then the equivalent of 100 tons of oil would be 175 tons of coal, for, taking the density of the oil as ·850, it would occupy about the same space as an equal weight of coals, or at the rate of about 53 pounds per cubic foot. This difference would enable a vessel capable of carrying coal for twelve days' steaming, to carry oil for twenty-one days. In burning this oil there would be a saving of labour in stoking, and as it would not give any ashes, a great deal of trouble would be saved in that way.

These results differ widely from the statements which have been made in reference to the relative efficiency of oil and coal, according to which it has been represented that one ton of oil was equal to from four to five tons of coal,* and that in regard to stowage-room the saving was "more than nine-tenths in bulk"!† It is true that those who have propounded these views have not arrived at them by a consideration of the data I have above referred to, and if I may judge from remarks lately made at the meeting of the Institute of Naval Architects,‡ they would appear to deny the applicability of those data for determining the question between coal and oil as fuel. Such a denial, however, would be of little account if it be not supported by adequate evidence of results, such as those which have been so much dwelt upon, being really obtainable; and although this subject has now been some years before the public, I am not aware of any evidence having yet been brought forward, such as would call for, or justify the abandonment of those well-established principles by which the heating power and efficacy of fuel is determined, as above stated.§

The results of the experiments made at Woolwich, under the superintendence of Mr. Trickett, the Engineer-in-Chief of the Dockyard, give, as the highest evaporative effect obtained with petroleum, 11·63 pounds of water converted into steam per pound of oil burnt. In this case, however, the combustion was imperfect. But in the most successful trials with coal oil and shale oil, when very little smoke was given off, the evaporative effect was about 18 pounds of steam produced per pound of oil burnt. In this

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* See 'Journal of the Royal United Service Institution,' ix. 66. "Petroleum as Steam Fuel," by Capt. J. H. Selwyn, R.N.; also C. J. Richardson, p. 70.

† Ibid. p. 69.

‡ See 'Engineer,' 10th April, 1868, p. 257.

§ Since writing this paper I have learnt that the same subject was discussed by Professor W. J. M. Rankine, at the United Service Institution, about a year ago, and I have great pleasure in referring to the opinions of such an authority in confirmation of the views I have expressed in regard to "Liquid Fuel."—["On the Economy of Fuel, comprising mineral oils." 'Journal of the United Service Institution,' xi. 218.] The very lucid and exhaustive exposition, given by Professor Rankine, of the conditions which determine the theoretical evaporative power of fuel ought to have been sufficient to prevent any continuance of misconceptions as to the possibility that the evaporative effects realized with fuel can exceed or even equal the extreme calculated power it is capable of producing.

case some deduction required to be made for the steam applied as a blast to the fire, but the amount was not ascertained. This result was also obtained under peculiarly favourable circumstances as regards the proportion of heating surface of the boiler to the rate of evaporation.

In regard to the supply of material capable of being used as liquid fuel, it is necessary to make a few remarks. First, as regards petroleum, I imagine it is now generally acknowledged that this material in its natural state is not well adapted for the purpose. In that state it contains a large amount of very volatile hydrocarbon, which, even at the ordinary temperature, vaporizes by contact with air, and the mixture of this vapour with air is explosive. At the temperature of a steam vessel's stokehole this vaporization would take place more readily, and if there were any leakage in the supply pipes or tanks, disastrous consequences might ensue. In order to remove this objection to the use of petroleum as liquid fuel, the more volatile portion of it must be separated by distillation, and that operation, when carried far enough to render the oil fit for use with safety, would reduce the quantity to about one-third.

Another objection to petroleum in its natural state is its bulkiness, the gallon weighing only about 8 pounds. This is to some extent removed by the distillation, and by the reduction of the quantity to one-third an oil is obtained which weighs about $8\frac{1}{2}$ pounds per gallon.

According to the latest returns, the total production of petroleum in America—which is out of all proportion the most abundant source of this material—amounts to about 360,000 tons a year. It would be mere speculation to offer any opinion as to whether this rate of production is the maximum which is attainable, or as to the time it may continue; but the prevailing impression is that the sources from which this supply originates are subterranean accumulations, and, therefore, not to be depended on beyond a certain limit. The experience of oil-winning in America has confirmed this view, for it has been found that the wells which were at first what are termed "flowing wells," *i.e.* yielding their oil spontaneously, have gradually ceased to flow; and that after pumping has been resorted to for bringing the oil to the surface, even that means gradually declined in its effect. It would therefore be unwise to rely upon the supply of petroleum as affording material for fuel. And then, if we consider the vast consumption of coal for the purpose of steam navigation—amounting, I believe, to not less than 10,000,000 tons a year in steam vessels belonging to this country alone, it will be seen that the production of petroleum—gigantic as it is in relation to the use to which it has been applied—is insignificent when compared with the requirements of steam navigation for fuel; that, in fact, the total production does not amount to 5 per cent. of the fuel consumed in the steam vessels of this country.

The possibility of obtaining an oil analogous to petroleum by distilling certain kinds of coal and some varieties of bituminous shale, constitutes another source of liquid fuel, and one which I consider to be far more important, for this country at any rate, than petroleum is. The material obtained from this source, and commonly known as crude paraffin oil, requires to be submitted to the same operation as petroleum, in order to remove the more volatile portion, and obtain an oil suitable for use as liquid fuel, but it would have the advantage of yielding rather a larger amount of such oil than petroleum does. To what extent the production of this oil might be developed as a source of supply for steam navigation, it would be almost impossible to form any approximative idea at present; but I may state, in regard to this point, that owing to the low price at which petroleum is now imported from America, the coal and shale oil works of this country have been almost entirely stopped, because of their inability to manufacture oil for burning at such a price as to compete with the American product. Circumstances which it would be out of place to enter into here, induce me to believe that if the use of liquid fuel were introduced to any extent into practice, it would be a very great advantage to the oil manufacturers of this country, and would be a means of enabling them to meet successfully the competition of the American oil used for burning in lamps. I have already spoken of the supply of "dead oil," furnished by the rectification of coal-tar, and need here only remark again that the quantity is very small. This is certainly the most suitable material for use as liquid fuel which I am acquainted with, and its excellence in this respect induces me to mention another possible source of a similar material, viz., the distillation of "slack," or the waste coal-dust, which accumulates at the mouth of a coal-pit. It is quite possible that by such means a quantity of oil, similar to that

resulting from the rectification of gas-tar, might be obtained, and, at the same time, the slack itself might be converted into a useful fuel.

There is also, in the Island of Trinidad, a vast deposit of bitumen, which has repeatedly been an object of passing interest on account of attempts to render it in some way useful. Unfortunately, most of those attempts have hitherto failed; but if liquid fuel should become an article in demand, I think there may be good days still in the future for Trinidad bitumen, for it has the peculiarity of yielding by distillation, about 30 per cent. of a thick, heavy oil, approximating very closely to the "dead oil" of the gas-tar refiner. This circumstance, which has hitherto been the disadvantage of the Trinidad bitumen, might then become its chief recommendation, and, according to all accounts, there is abundance of it, and the getting of it is not attended with difficulty.

The relative cost of coal and oil is, to some extent, still an open question. If it should be found advantageous to use oil as fuel for steam vessels, it is probable that neither crude petroleum nor paraffin oil as obtained by distilling coal or shale would be the most suitable for the purpose, and that it would be advisable to separate from either of those materials the more volatile portions, which are applicable for burning in lamps. The less volatile portion, both of petroleum and of shale oil, amounting in the former to about 30 per cent., and in the latter to about 40 per cent., would be for several reasons best adapted for use as fuel. It is not so much in demand as the oil used for lamps, and being less volatile it could be stowed with greater safety. But I doubt much whether this oil could be shipped for less than £5 per ton. If that opinion is correct, according to the comparative estimate already made between coal and oil, the cost of the latter would be about three times as much as that of coal. That there may be circumstances under which the advantages to be gained by the use of oil as fuel would altogether outweigh any considerations as to this, or even a greater rate of cost, it does not require any great penetration to perceive; but it appears to me equally evident that if those advantages are to be attained only at such a cost, the use of oil as fuel for steam vessels must, in any case, be restricted to exceptional cases, in which cost is comparatively a matter of secondary importance, and that it cannot be regarded as likely either to revolutionize steam navigation in general, or to call for a total reconstruction of our navy.

At this point, however, the consideration of the subject reaches a stage where it is more the province of the merchant and of the naval engineer to deal with it, and to determine the balance between the greater efficacy of this material as fuel, and the greater cost which its application would involve. I therefore leave it here for those more competent than myself to discuss these points, with the hope that the attempt I have made to elucidate the subject, so far as I am able, may be found of some utility in its further development.

I cannot, however, conclude this paper without taking the opportunity of expressing my opinion that the mode in which this subject has hitherto been dealt with, illustrates in a most striking manner, the want which is now somewhat vaguely felt of what is termed "technical education," by which I understand a means, not merely of making those whose business is of a practical character better acquainted with the principles of science and the laws of nature than is generally the case in this country, but also of educating the cultivators of science in a knowledge of the requirements of art, and of the conditions under which science can be made serviceable to practice. If such a closer alliance between science and practice were achieved, I believe it would be found of mutual advantage, and then I apprehend we should soon cease to hear anything more of that fancied antagonism between the two which is the most effectual barrier to progress, and deserves only to be regarded as an indication of ignorance or bigotry.

INVESTIGATIONS WITH RESPECT TO AQUA LAUROCERASI.

BY J. BROEKER,

APOTHECARY TO THE FORCES.

This paper contains statements, from various authors and Pharmacopœias, relating to laurel-water, and investigations by the writer himself. In the latter he proposed to an-

swer the question, What influence the time of collecting the leaves may have on the amount of prussic acid present? In order to answer this question, he collected, every month during a whole year, fresh leaves of the *Prunus Laurocerasus*, and each time prepared with them aqua laurocerasi, according to the directions of the 'Netherlands Pharmacopœia.' The results of this series of experiments are as follow:—

Months.		Quantity of Cyanide of Silver from one ounce.	
		Milligrammes.	Grains. (±)
November, 1864	6 drs. of leaves of laurocerasus, *cut fine*, digested for 24 hours with 12 drs. of water, at 59° F., 5 drs. being distilled from the same in a glass retort.		
December, ,,		250	$3\frac{3}{4}$
January, 1865		170	$2\frac{2}{3}$
February, ,,		170	$2\frac{2}{3}$
March, ,,		120	$1\frac{7}{8}$
April, ,,		220	$3\frac{1}{3}$
May, ,,		170	$2\frac{2}{3}$
June, ,,		200	$3\frac{1}{8}$
July, ,,		250	$3\frac{7}{8}$
August, ,,		300	5
September, ,,		240	$4\frac{2}{3}$
October, ,,		280	$4\frac{1}{3}$

From these results it appears that in 1865, a year in which the summer was very warm, and in which vegetable growth was extremely early and abundant, the leaves plucked in July yielded the largest quantity of cyanide of silver in the laurel-water. In the following year, the October leaves seemed to yield the strongest water. Of course the nature of the soil and of the weather may always modify these results. As to the mode of preparation, experience showed that the strongest water is obtained by cutting the leaves small, and thereupon distilling directly. To distil from the leaves whole is a quicker method, which usually affords a water which is still stronger than the Netherlands Pharmacopœia requires.—*Selections from the Dutch Archives of Medical and Physical Science, by Dr. Moore.*

BARON LIEBIG "ON A NEW METHOD OF BREAD-MAKING."

Baron Liebig has just made some important researches on a new method of bread-making. He remarks on the stationary character of this art, which remains to the present day much in the state in which it was thousands of years ago. He dwells upon the sanitary importance of the mineral constituents of grain, and the necessity of a sufficiently abundant supply of them in bread. These are best found in certain kinds of black and brown bread, which are, therefore, more wholesome than the white bread that is nevertheless preferred by most people (especially by the lower orders), on account of its better appearance and superior palatableness. The problem has hence arisen, how to provide a beautiful white bread which shall contain all the essential mineral constituents of black bread. These mineral constituents (phosphate of potash, lime, magnesia, and iron) are introduced into the bread by the use of the baking-powder invented by Professor Horsford, of Cambridge, in North America. This baking-powder consists of two powders—the one acid, the other alkaline. The acid powder is phosphoric acid in combination with lime and magnesia; the alkaline powder is bicarbonate of soda. Two measures made of tinned iron, the larger one for the acid powder and the smaller one for the alkali, are employed. When bread is required to be made, every pound of flour is mixed with a measure of the acid powder and a measure of the alkali powder, and sufficient water added to make dough, which is presently made into loaves and baked. In one and a half to two hours bread may be made by this process. The chemical change which takes place will be

easily intelligible: carbonic acid is generated and phosphate of the alkali is formed at the same time. The essential feature in Horsford's invention is the economical getting of phosphoric acid in the shape of a dry white powder. This is done by taking bones, burning them, and then treating the well-burnt bone-earth (which consists of phosphate of lime and magnesia) with a certain quantity of sulphuric acid, so as to remove two-thirds of the lime and leave a soluble superphosphate of lime. The sulphate of lime which results from the action of the sulphuric acid is separated from the rest by filtration, and the solution subsequently concentrated by evaporation, and, when it becomes very concentrated, mixed with a certain quantity of flour, and dried up. The mixture of flour with the superphosphate admits of being reduced to the finest powder, and constitutes the acid powder just referred to. It will be observed that the alkali-powder contains soda, whereas potash is required in order to furnish the right kind of mineral salts. Liebig proposes to rectify this defect by using a certain quantity of chloride of potassium along with the alkali. Chloride of potassium is now tolerably cheap, owing to the finding of immense quantities of it at Strassfurt. Baron Liebig, in order, as he says, to avoid being bothered, has appointed Herr Zimmer, of Mannheim, and Herr Marquart, of Bonn, his agents for his new baking powder; and those interested may, if they like, get it from them.—*British Medical Journal*, Jan. 2, 1869.

POISONING BY PERCHLORIDE OF IRON.

A case is recorded in the 'Lancet' of January 2nd, in which a lady aged thirty had, in a fit of passion, caused by a quarrel with her husband, swallowed the contents of an ounce bottle of tincture of perchloride of iron. She was seized with violent convulsions. Sulphate of zinc emetics were given in the intervals of the spasmodic attacks, under which treatment she ultimately recovered. The symptoms of irritant poisoning were attributed to the free hydrochloric acid present in the tincture.

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Mould, Samuel, 21, Moorgate St., E.C.	0	10	6
Mumford, G., 5, Bathurst St., Hyde Park, W.	1	1	0
Naylor, J., 3, High Street, Bow, E.	0	2	6
Nicholson, F., St. Paul's Road, N.	1	1	0
Northway, J., 27, Gt. Tower St., E.C.	1	1	0
Orpe, T. M., Old Kent Road	0	10	6
Orridge, B. B., 32, Ironmonger Lane	1	1	0
Pafford, W. H., 338, Oxford St., W.	0	5	0
Parker, Wm. S., Oxford Street, W.	0	5	0
Parkinson and Son, Southampton Row	1	1	0
Penrose, A. W., 5, Amwell Street, W.	0	10	6
Peppin, S. H., 25. Princes St., W.	0	10	6
Pidduck, John, Harrow Road, W.	0	10	6
Plummer, George, Peckham, S.E.	1	1	0
Pollock and Co., Fenchurch St., E.C.	2	2	0
Porter, John T., 338, Oxford Street,W.	0	5	0
Porter, W. H., Brixton	0	10	6
Potter, W. S., Plaistow, E.	0	5	0
Preston and Sons, Leadenhall Street	2	2	0
Quiller, C. R., Sloane Square, S.W.	0	10	6
Quinlan, J. Barnsbury Road, N.	0	10	6
Ramsey, J. W., Endsleigh St., W.C.	0	10	6
Richardson, G., Notting Hill, W.	0	10	6
Roach, Pope, St. James's St., S.W.	0	10	6
Robbins, J., and Co., Oxford Street	1	1	0
Roberts, A. J., 270, Walworth Rd., S.	1	1	0
Rose, Alfred, Maida Hill East, W.	0	10	6
Rowe, Robert, West Brompton, S.W.	0	10	6
Rowntree, Thomas, Barnsbury, N.	0	10	6
Rowson, Henry, Chichester St., W.	0	10	6
Sadler, Wm., Norton Folgate, N.E.	0	10	6
Sainsbury, Samuel, 177, Strand, W.C.	1	1	0
Salke, Thos. K., 87 and 88, Mount Strt.	1	1	0
Salmon, Thos., 81, Cornwall Road, W.	0	10	6
Sandford, S. W., 47, Piccadilly	2	2	0
Sanger, J., and Sons, 150, Oxford St.	2	2	0
Sanger, Wm. A., 150, Oxford Street	1	1	0
Saunders, T. H., Queenhithe	2	2	0
Sharp, John J., 388, Oxford Street	0	5	0
Shephard, T. F., Wellington Road	0	10	6
Shirley, J. G., Westbourne Grove, W.	1	1	0
Sims, J. F., Hemingford Road, N.	0	10	6
Sleggs, Geo. R., 220, Regent Street, W.	0	5	0
Slipper, James, Leather Lane, E.C.	0	10	6
Smallfield, J. S., 10, Little Queen St.	0	10	6
Smith, W. F., 280, Walworth Road, S.	1	1	0
Starkie, Richard S., 4, Strand, W.C.	1	1	0
Stathers, John, Norland Road, W.	0	10	6
Steer, Philip R., Hackney, N.E.	0	10	6
Stickland, W. H., South Kensington	1	1	0
Stocken, James, Euston Square, N.W.	0	5	0
Stoneham, Philip, Craven Place, W.	0	10	6
Strawson, G. F., High Holborn, W.C.	0	5	0
Suart, Benjamin, 14, Bath Street	1	1	0
Taylor, Thomas, Peckham, S.E.	0	10	6
Taylor, J. E., and Co., 10, Little Queen Street, W.C.	1	1	0
Thomas, H., Upper St. Martin's Lane	0	10	6
Thompson, J., 11, Aldersgate St., E.C.	1	1	0
Thompson, H. A., 22, Worship St., E.C.	1	1	0
Thorn, John J., 338, Oxford Street, W.	0	5	0
Tibbs, F., 47, Blackfriars Road, S.	0	10	6
Tippett, B. M., 3, Sloane St., S.W.	0	10	6
Treloar, T., 67, Ludgate Hill	0	10	6
Trotman, A. C., 29, Chapel Street	0	10	6
Turner, C. E., Great Russell St., W.C.	0	10	6
Umney, C., 40, Aldersgate St., E.C.	0	10	6
Vizer, E. B., 63, Lupus St., S.W.	1	1	0
Walker, W. H., 50, Compton Street	0	5	0
Wallis, J. T. W., 338, Oxford Strt., W.	0	5	0
Warner, Charles H., 55, Fore St., E.C.	1	1	0
Warner, Richard and Co., 20, Charterhouse Square, E.C.	1	1	0
Waugh, Alex., 177, Regent Street, W.	0	10	6
Weston, S. John, Westbourne Ter., W.	1	1	0
Whitaker, John, 49, London Street, W.	1	1	0
Whitburn, Augustus R. 174, Regent St.	0	10	6
White, Daniel, and Son, 19, Park Terrace, Regent's Park, N.W.	1	1	0
Whysall, Wm., 199, Fleet Street, E.C.	0	5	0
Wigg, Henry J., 338, Oxford Street, W.	0	10	6
Williams, John, New Cavendish Street	1	1	0
Williams, Joseph John, Harrow Road	0	10	6
Willows, J. and J., 101, High Holborn	2	2	0
Wilson, Thomas, Upper Holloway, N.	0	10	6
Windle, Wm., 48, Portman Place, W.	0	10	6
Wretts, John R., 388, Oxford Street, W.	0	5	0
Wood, Edward, 49, Berners Street, W.	0	10	6
Wooldridge, John, 290, Euston Road	0	10	6
Wyman, John, 122, Fore Street, E.C.	1	1	0
Young, Wm., 116, Ball's Pond Road, N.	0	10	6
Young, George, Millwall, E.	0	5	0

Country.

	£.	s.	d.
Aberayron, Jones, J. P.	0	10	6
Aberdare, Thomas, William	0	10	6
Abergavenny, Ackrill, George	0	10	6
Airdrie, Harvie, John	0	10	6
Alderley Edge, Hampson, Robert	0	10	6
Alfreton, Robinson, Joseph S.	0	10	6
Alton, Monk, Albert Jeffery	1	1	0
Amble, Tweddell, J.	0	5	0
Ampthill, Allen, George	0	10	6
Ashford, Ingall, Joseph	1	1	0
Ashton-under-Lyne, Bostock, William	0	10	6
Aylesbury, Turner, John	0	10	6
Bala, Jones, Thomas	0	10	6
Banbury, Ball, George V.	0	10	6
Banff, Ellis, Bartlet	0	10	6
,, Low, Joseph	0	5	0
Barking, Fitt and Son	0	10	6
Barnett, New, Young, Robert Fisher	0	10	6
Barnoldswick, Livsey, N.	0	2	6
Barnstaple, Curtis, William	0	10	6
,, Goss, Samuel	0	5	0
Barton-on-Humber, Ingoldby, William	0	2	6
Bath, Brooke, Charles	0	10	6
,, Davies, Barnett, and Co.	0	10	6
,, Commans, Robert D.	1	1	0
,, Candy, W. G.	0	10	6
,, Ekin, Charles	1	1	0
,, Lear, William M.	0	10	6
,, Pooley, John C.	0	5	0
,, Rolfe, William A.	0	5	0
,, Tylee, John P.	1	1	0
,, Walker, Henry John	0	10	6
Bedale, Fowler, Edward	0	10	6
Bedford, Anthony and Son	0	10	6
,, Walton, George C.	0	7	6
,, Taylor and Cuthbert	0	10	6
Berwick, Carr, William Graham	0	10	6
,, Davidson, John	0	10	6
Bethel, Williams, Hugh	0	10	6
Beverley, Hobson, Charles	0	10	6
,, Robinson, James Mowld	0	5	0
Bewdley, Newman, Robert	0	10	6
Bidford, Sill, S.	0	10	6
Bideford, Hogg, Thomas	0	5	0

	£	s.	d.
Bilston, White, Thomas	1	1	0
Binbrook. Maugham, Samuel	0	10	6
Birkenhead, Reece, John	0	5	0
Birmingham, Churchill, John	0	10	6
,, Clayton, Francis C.	0	10	6
,, Lucas, Joseph	0	10	6
,, Mantell, Charles	0	10	6
,, Musson, Telemachus G.	0	10	6
,, Palmer, C. F.	1	1	0
,, Pegg, Herbert	0	10	6
,, Robinson, E.	0	10	6
,, Snape, Edward	0	5	0
,, Southall, Son, and Dymond	1	1	0
Bishop Auckland, Armstrong, James	0	2	6
Bishop Stortford, Speechly, George	0	10	6
Blandford, Groves, Wellington E.	0	10	6
Bodmin, Williams, Joel D.	1	1	0
Bognor, Long, Alfred T.	0	10	6
Boston, Marshall, Robert	0	10	6
Bradford, Yorks., Faull, John	1	1	0
,, ,, Harrison and Parkinson	2	2	0
,, ,, Hick, Joseph	0	10	6
,, ,, Rogerson, M. and Son	1	1	0
,, ,, Walker, John	0	10	6
Brecon, Bright, Philip	1	1	0
Bridge, Thomas, James	0	5	0
Bridgewater, Woodward, John L. L.	0	5	0
Bridgnorth, Steward, William	0	10	6
Bridport, Beach, James	0	10	6
,, Tucker, Charles	0	10	6
Brighton, Barton Brothers	1	1	0
,, Brew, Thomas A.	0	10	6
,, Cornish, William	0	5	0
,, Foster, Frederick	0	10	6
,, Glaisyer and Kemp	1	1	0
,, Gwatkin, James Thomas	0	10	6
,, Noakes, Richard	0	10	6
,, Padwick, John	0	10	6
,, Robson, Thomas	0	10	6
,, Schweitzer, J.	2	2	0
,, Smith, William	0	10	6
Bristol, Ackerman, Theophilus	1	1	0
,, Bristol and Clifton Chemists' Assistants' Association (H. G. Gibbs, Hon. Sec.)	1	1	0
,, Butler, Samuel	0	10	6
,, Flower, R.	0	2	6
,, Hodder, Henry	0	5	0
,, Jones, E. H.	0	2	6
,, Lacey, Walter	2	2	0
,, Margetson, J.	0	10	6
,, Sircom, Richard	0	10	6
,, Stoddart, William W.	0	10	6
,, Thomas, J. D.	0	10	6
Bromley, Baxter, William W.	0	10	6
,, Shillcock, Joseph B.	0	10	6
Broseley, Stevens, John	0	10	6
Brynmawr, Jones, Alfred M.	0	5	0
Buckingham, Sirett, George	1	1	0
Bude, Pellow, Brothers	1	1	0
Burslem, Blackshaw, Thomas	0	10	6
Burton-on-Trent, Barnett, Joseph	1	1	0
Bury St. Edmunds, Hardwicke, J. E.	0	10	6
Caistor, Capis, George Test	0	5	0
Cambridge, Deck, Arthur	0	10	6
,, Gillett, Crabb	0	10	6
Canterbury, Amos, Daniel	0	10	6
,, Hall, John R.	0	10	6
,, Harvey, Sidney	0	10	6
,, Gardner, Austin Walter	0	10	6
,, Paine, William	0	10	6
Cardiff, Joy, Francis William	0	10	6
Cardigan, Evans, John	0	5	0
Carlisle, Hallaway, John	0	5	0
,, Sawyer, James	0	5	0
Cerrig-y-Druidion, Williams, Elias	0	10	6
Chatham, Crofts, Holmes Cheney	0	10	6
Chatham, French, Gabriel	0	10	6
,, Tribe, John	0	10	6
Chelmsford, Baker, Charles P.	0	10	6
,, Baker, Gerrad	0	10	6
,, Seaton, George	1	1	0
Cheltenham, Butcher, Thomas	2	2	0
,, Fletcher and Palmer	1	1	0
,, Proctor and Forth	1	1	0
Chertsey, Boyce, George	0	5	0
Cheshunt, Butt, Edward N.	0	10	6
,, Knowles, Richard J.	2	2	0
Chester, Bowles, Charles A.	0	5	0
,, Jones, Robert	1	1	0
Chichester, Pratt, John	0	10	6
Chorley, Moss, John	0	5	0
Chowbent, Warburton, Thomas	0	5	0
Cirencester, Smith, Charles S.	1	1	0
Clapton, Lower, Goodwin, John	1	1	0
,, *Upper*, Granger, Edwin J.	1	1	0
Cockermouth, Bowerbank, Joseph	1	1	0
Colchester, Chaplin, John L.	0	5	0
,, Manthorp, Samuel	0	5	0
,, Shenstone, James B.	0	5	0
,, Prosser, Evan T.	0	5	0
Colombo, Bisset, George M'Ritchie	0	10	6
Coningsby, Brown, Samuel	0	5	0
Cottingham, Lister, George	0	10	0
Coventry, Hinds, James	0	10	6
Crewkerne, Strawson, Henry	0	10	6
Crickhowell, Christopher, William	0	5	0
Crowland, Wilson, Gaudern	0	10	0
Croydon, Long, Henry	0	10	6
Cullen, Seivwright, George	0	10	6
Darlington, Abbott, John Thomas	0	5	0
,, Swenden, James	0	10	0
Dartford, Edwards, George	0	10	6
Dartmouth, Rees, William Henry	0	10	6
Deal, Green, John	0	10	6
,, Clarabut, John Blaxland	0	10	0
Denbigh, Edwards, William	0	5	0
Denby, Pym, J. William	0	5	0
Deptford, Lloyd, Henry	0	10	6
,, Lockyer, George	0	10	6
Derby, Goodhall, Henry	0	10	6
Devizes, Madge, James C.	0	10	6
Diss, Cupiss, Francis	0	10	6
Doncaster, Howarth, James	0	10	6
Dorking, Clark, William W.	0	7	6
Douglas, Breary, Wm. A.	0	5	0
Dover, Bottle, Alexander	1	1	0
,, Forster, Robert	0	10	6
,, Hambrook, O.	0	5	0
Dudley, Dennison, Matthew	0	5	0
,, Hollier, Elliott	0	10	6
,, Wilson, Richard Bowes	1	0	0
Durham, Belough, Henry M.	1	1	0
,, Burdon, John	0	10	6
,, Peele, Henry A.	0	10	6
,, Sarsfield, William	0	10	6
,, Wortley, John	0	10	6
Ealing, Barry, Thomas	0	10	6
Edinburgh, Aitkin, William	0	10	6
,, Baildon, Henry C.	1	1	0
,, Brown, David R.	1	1	0
,, Buchanan, James	0	10	6
,, Duncan, Flockhart, and Co.	1	1	0
,, Gardner and Ainslie	1	1	0
,, Macfarlan, J. F. and Co.	1	1	0
,, Macfarlane, Andrew Yuile	0	5	0
,, Mackay, John	1	1	0
,, Noble, Alexander	1	1	0
,, Raimes and Co.	1	1	0
,, Robertson, James	0	10	6
,, Smith, Thomas	2	0	0
Eltham, Rix, William	2	2	0
Exeter, Bromfield, Charles	0	5	0
,, Cooper, George	0	10	6

	£	s.	d.
Exeter, Husband, Matthew	0	10	6
,, Napier, George L.	0	5	0
,, Palk, John	0	10	6
,, Stone, John	0	5	0
,, Tanner, Benjamin	0	5	0
,, Tanner, Nicholas W.	0	5	0
Fairfield, Tanner, Alfred E.	0	10	6
Fareham, Peat, Walter	0	9	0
Faringdon, Ballard, Arthur	0	10	0
Farnham, Crook, George	0	10	6
Folkestone, Hammon, Richard	0	5	0
Fordinbridge, Haydon, Frederick W.	0	5	0
Forest Hill, Furze, Henry	0	10	6
,, Simpson, Thomas	0	5	0
Gainsborough, Collitt, Eliza	0	5	0
,, Marshall, John Ferris	0	10	6
Gateshead, N. C., Elliott, Robert	0	10	6
,, Garbutt, C. D.	0	10	6
Glasgow, Currie, J.	0	5	0
,, Kinninmont, Alexander	0	10	6
Gloucester, Berry, Edward	0	5	0
,, Curtis, Albert A.	0	10	6
,, Stafford, William	0	5	0
Godalming, Christian, George	0	2	6
,, Forster, W. D.	0	2	6
Goole, Hasselby, Thomas J.	0	5	0
,, Roulston, Benj. W.	0	10	6
Gosport, Hunter, John	0	5	0
,, French, Benjamin	0	10	6
Grantham, Hall, Thomas	0	10	6
,, Newcome, John	1	1	0
Gravesend, Beaumont, William H.	1	1	0
,, Spencer, Charles	1	1	0
,, Drury, George S.	1	1	0
Grays, Soole, John Henry	0	10	6
Great Bedwin, Gerard, G. R.	0	5	0
Greenwich, Tugwell, Wm. H.	0	10	6
Grimsby, Cook, Robert	0	10	0
Guildford, Martin, Edward W.	0	10	6
,, Shepherd, George P.	1	1	0
Halifax, Jennings, William	1	1	0
,, Jessop, Jonathan	0	5	0
Hambledon, Gunn, John	0	5	0
Hanwell, Squire, William	0	10	6
Harleston, Muskett, James	0	10	6
Harrogate, Coupland, Joseph	0	10	6
,, Greenwood, John	0	10	6
Harrold, Fever, William	0	10	6
Hartlepool (West), Cooper, S. H.	0	2	6
,, Emerson, Cuthbt.	0	10	0
Harwich, Bevan, Charles H.	0	5	0
Haverfordwest, Saunders, D. P.	0	10	6
Hawthorn, Rawle, W.	0	3	0
Hay, Davies, John L.	0	5	0
Heavitree, Brailey, Charles	0	5	0
Heckmondwike, Booth	1	1	0
,, Stead, Walter	0	10	6
Helston, Wakeham, Charles	0	5	0
Hendon, Goldfinch, George	0	10	6
Hexham, Bell, George	1	1	0
Heywood, Beckett, William	0	10	6
Hirwain, Sims, Joseph	0	10	6
Home-on-Spalding-Moor, Hudson, H.	0	10	0
Honiton, Turner, George	0	10	6
Horsham, Jull, Thomas	1	1	0
,, Williams, Philip	0	10	6
Howden, Saville, John	0	10	6
,, Selley, William	0	10	6
Huddersfield, Fryer and King	1	1	0
,, Higgins, Tom S.	0	10	6
Hull, Baynes, James	0	10	6
,, Earle, Francis	0	10	6
,, Hudson, John (per Mr. Baines)	2	2	0
,, Hall, Henry R. F.	0	5	0
,, Kirton, Joseph B.	0	10	6
,, Metcalfe, Christopher L.	0	10	6
Hunslet, Williamson, James	0	5	0
Hunstanton, Twiss, William	0	10	0
Ilford, Beal, Edmund J.	0	10	6
Insch, Macmillan, William	0	7	6
Jedburgh, Rawden, Joseph	0	5	0
Jersey, Millais, Thomas	1	1	0
Kaffraria, Daines, Thomas	0	10	6
Kidderminster, Bond, Charles	0	10	6
,, Steward, Josiah	0	10	6
,, Steward, Theophilus	0	10	6
Kingsgrove, Pickburn, G. H.	0	5	0
Kilmarnock, Borland, John	0	10	6
,, Rankin, William	1	1	0
Lancaster, Wearing, William	0	10	6
,, Whimpray, John	0	10	6
Lasswade, Macdonald, John	0	5	0
Leamington, Barnett, John	0	10	6
,, Woolcott, Charles	0	10	6
,, Davis, Henry	0	5	0
,, Jones, Samuel W.	0	10	6
,, Pullin, W. H.	0	10	6
Leatherhead, Hewlins, Edward	0	10	6
Leeds, Brooke, Thomas	0	10	6
,, Hirst, John Andus	0	10	6
,, Harvey, Thomas	0	10	6
,, Jefferson, Peter	0	5	0
,, Reinhardt, Johann C.	0	10	6
,, Reynolds, Richard	0	10	6
,, Sagar, Henry	0	5	0
,, Smeeton, William	0	10	6
Lees, near Oldham, Marlor, Jabez	0	10	6
Leicester, Butler, Thomas E.	0	5	0
,, Cooper, Thomas	1	1	0
,, Richardson, J. G. F.	1	1	0
,, Salisbury, W. Bryan	0	10	6
Leighton Buzzard, Richmond, Robert	0	10	6
Leith, Wilson, James	2	2	0
Leominster, Davis, D. Frederick	1	1	0
Lewes, Head, John	0	10	6
,, Martin, Thomas	0	10	6
,, Saxby, Henry	0	10	6
Lewisham, Clift, Edward	1	1	0
Leytonstone, Tilfer, Frederick	0	10	6
Lincoln, Lincoln Chemists' Association	1	1	0
,, Tomlinson, Charles K.	0	10	6
,, Woodcock, Page D.	0	5	0
Liverpool, Bramwell, George	0	10	6
,, Barber, George	0	10	6
,, Bromley, Charles	0	10	6
,, Fergusson, John	1	1	0
,, Haywood, Charles	0	2	6
,, Horton, Arthur T.	0	5	0
,, Hunt, Thomas	0	10	6
,, Jones, Owen L.	0	10	6
,, Maskery, Samuel	1	1	0
,, Roberts, Hugh	0	2	6
,, Sleggs, George R.	0	5	0
Llanegryn, Pugh, Hugh	0	2	6
Llangollen, Jones, Humphrey	0	5	0
Long Bennington, Bemrose, John	0	10	6
Looe, Hicks, James Sellick	0	10	6
Loughborough, Paget, John	0	5	0
Louth, Hurst, John	0	10	6
Lower Tooting, Medcalf, Ebenezer	0	5	0
Lowestoft, Edmonds, Benjamin M.	0	5	0
Ludlow, Cocking, George	0	5	0
,, Smith, A. J.	0	10	6
Lydney, Smith, John	0	10	0
Lyme Regis, Henley, Henry	0	5	0
Macclesfield, Dale, Samuel	0	10	6
Macduff, Henry, Andrew	0	5	0
Maidenhead, Thompson, Charles H.	2	0	0
Maidstone, Rogers, William	0	10	6
Malton (York), Horsley, William	1	0	0
Malvern (Great), Burrows, Messrs.	1	1	0
Manchester, Benger, Frederick Baden	0	5	0
,, Brown, William Scott	1	1	0
,, Carter, William	0	10	6

	£.	s.	d.
Manchester, Halliday, William Jabez	0	10	6
,, Jackson, Thomas	0	10	6
,, M'Minn, James	0	10	0
,, Mather, William	2	2	0
,, Mitchell, John	0	10	6
,, Mumbray, Henry George	0	10	6
,, Paine, Standen	0	10	6
,, Ritson, John	0	5	0
,, Skelton, William	0	2	6
,, Walsh, Edward	0	10	6
,, Wilkinson, William	0	10	6
,, Williams, Martha	0	5	0
,, Woolley, Hermann	1	1	0
,, Wright, Charles	1	1	0
Margate, Candler, Joseph T.	0	10	6
,, Wootton and Son	0	10	6
Market Drayton, King, William George	1	1	0
Maryport, Cockton. John	0	5	0
Merthyr Tydfil, Rees, Thomas	0	5	0
Middlesborough, Taylor, William Jas.	0	10	6
Middleton, Livsey, John Ward	0	2	6
Millbrook, Rowe, Samuel	0	10	6
Minehead, Bond, John	0	5	0
,, Williams, Charles E.	0	5	0
Monmouth, Dawe, Sampson	0	10	6
Montreal, Mercer, Nathan	0	10	6
Needham Market, Harrington, Allen	0	7	6
Netherstowy, Ham, John	1	1	0
New Brompton, King, Thomas S.	0	10	6
Newcastle-on-Tyne, Brady, Henry B.	1	1	0
,, ,, Potts, Thomas	0	10	6
,, ,, Proctor, B. S.	1	1	0
Newcastle-under-Lyne, Cartwright, W.	0	10	6
Newmill, Turner, William	0	5	0
Newport, Monmouthshire, Pearman, H.	0	10	6
Newport, Salop, Picken, Thomas W.	0	10	6
Newton Abbott, Poulton, John	0	10	6
Newtown, Morgan, Richard	0	10	6
Northallerton, Warrior, William	0	10	6
Northampton, Barry, James and E.	1	1	0
,, Mayger, W. D.	1	1	0
Norwich, Arnold, Edward	0	5	0
,, Caley, Albert J.	0	10	6
,, Cooke, William	0	5	0
,, Bliss, Joseph James	1	0	0
,, Sutton, Francis	0	10	6
Nottingham, Jenkins, Joseph	0	10	6
,, Parr and Atherton	1	1	0
,, Williams and Fitzhugh	1	1	0
Oakham, Wellington, James M.	0	10	6
Odiham, Hornsby, John H.	0	10	6
Oldbury, Briggs, George	0	10	6
Oldham, Bagshaw, William	0	10	6
,, Hargraves, Henry L.	0	10	6
,, Henthorn, Joshua	0	10	6
Otley, Pratt, Richard M.	0	10	6
Oundle, Turner, R.	0	10	6
Oxford, Hitchcock, Charles E.	1	1	0
,, Houghton, Thomas	0	10	6
,, Prior, George T.	0	10	6
,, Walsh, Edward	1	1	0
Partick, Rait, Robert C.	0	5	0
Paulton, Bush, Thomas	0	5	0
Peckham, Manley, W. F.	0	10	6
Pembroke Dock, Saer, David Protheroe	0	10	6
Pensnett, Machin, Mrs. H.	0	5	0
Perth, Reid, Neil	0	5	0
Petherton, South, Wellington, F. G. N.	0	5	0
Plaistow, Potter, W. S.	0	5	0
Plymouth, Balkwill, Alfred P.	0	5	0
,, Burwood, James	0	5	0
,, Hill, Simon	0	2	6
,, Northcroft, Jonathan	0	5	0
,, Sloggett, Thomas C.	0	2	6
Pontypridd, Bassett, Charles	0	10	6
Portobello, Kemp, David	0	10	6
Portsea, Tryon, W. George	0	5	0
Portsmouth, Parsons, William	0	10	6
,, Pasmore, George	0	10	0
Portsoy, Clark, James	1	1	0
Preston, Oakey, Joseph M.	0	10	6
Putney, Farmer, John	0	5	0
,, Jones, Thomas	0	5	0
Quorndon, Squire, Benjamin	0	1	0
Ramsgate, Morton, Henry	0	5	0
Reading, Hayward, William G.	0	5	0
Rhydlyom, Hughes, Robert	0	10	0
Rhyl, Jones, Ellis Powell	0	10	6
,, Foulkes, William H.	0	10	6
,, Hughes, Robert	0	10	0
Richmond, Surrey, Clarke, Thomas M.	0	10	6
,, ,, Hopwood and Son	1	1	0
Richmond, Yorks., Thompson, Thomas	0	10	6
Rochdale, Booth, James	1	1	0
,, Lord, Ellis	0	5	0
,, Bamford, J. W.	1	1	0
,, Taylor, Edward	0	5	0
,, Whitehead, John	0	5	0
Rochester, Harris, Henry W.	0	10	6
Rock Ferry, Dutton, John	1	1	0
Romford, Lasham, John	0	5	0
,, Pertwee, Edward	0	10	6
Rothbury, Farrage, Robert	1	1	0
Rotherham, Booth, Nathaniel	0	10	6
Rothesay, Mackintosh, Archibald	0	5	0
Rothienay, Pirrie, Charles	0	5	0
Rugby, Garratt, John C.	0	5	0
,, Garratt, Samuel	0	5	0
,, Lewis, Thomas C.	0	5	0
Ruthin, Bancroft, J. J.	0	10	6
,, Lloyd, Brothers	0	5	0
Ryde, Gibbs, William	0	10	6
,, Taylor, Richard	0	10	6
,, Wavell, John	0	10	6
Rye, Smith, A. W.	0	10	6
Salford, Manfield, John W.	0	5	0
Salisbury, Atkins, Samuel Ralph	0	10	6
Saltaire, Bayley, G. H.	0	2	6
Sandbach, Clisby, S.	0	10	6
,, Gilbert, S.	0	5	0
Sandwich, Harris, Henry	0	10	6
Scarborough, Smart, John	0	10	6
,, Whitfield, John	1	1	0
Seacombe, Holt, Richard Wylde	0	5	0
Selby, Cutting, Thomas J.	0	5	0
Selkirk, Dunn, John	0	10	6
Settle, Tatham, John and Son	0	10	6
Seymour (Victoria), Henshall, S. H.	0	2	6
Sheffield, Ellinor, George	0	10	6
,, Gowland, W. and G. R.	1	1	0
,, Maleham, Henry	0	10	6
Shefford, Baigent, W. H.	0	10	6
Shields (North), Hunter, Thomas	0	5	0
Shields (South), Mays, R. J. J.	0	10	6
Shildon, Veitch, William	1	1	0
Shrewsbury, Blunt, Thomas	0	10	6
,, Cross, William Gowen	0	10	6
Sidmouth, Chessall, Rowland	0	10	6
Sittingbourne, Gordelier, Paul W. G.	1	1	0
Sleaford, Heald, Benjamin	0	10	6
Slough, Griffith, Robert	0	10	6
Southampton, Palk, Edward	1	1	0
,, Randall, Wm. B. (1867)	1	1	0
Southend, Wheeler, James	0	10	6
Southport, Walker, W. H.	0	10	6
Southsea, Rastrick and Son	0	10	6
Sowerby Bridge, Stott, William	0	10	6
Spalding, Swift, Francis	0	10	6
Spilsby, Rainey, Edward	0	10	6
Stafford, Averill, Henry Allcock	1	1	0
,, Averill, John	1	1	0
Staines, Jones, Edward G.	0	5	0
St. Alban's, Martin, Henry G.	0	10	6
,, Roberts, Albinus	1	1	0

	£.	s.	d.
St. Asaph, Roberts, Peter	0	10	6
St. Austell, Geldard, John	0	2	6
St. Day, Corfield, Thomas J. T.	0	10	6
St. Helen's, Thompson, Robert	1	0	0
St. Leonard's, Maggs, Samuel B.	1	1	0
St. Neot's, Dring, William	0	10	6
Stapleford, Barton, W. and J.	1	0	0
Stockport, Shaw, Alexander Henry	1	1	0
Stockton-on-Tees, Brayshay, W. B.	1	1	0
,, Hodgson, E., & Son	0	10	6
,, Brayshay, Thomas	0	10	6
,, Horner, T. B.	0	10	6
Stoke-on-Trent, Pickburn, G. H.	0	5	0
Stourbridge, Bland, John H.	0	10	6
,, Hughes, Samuel	0	10	6
,, Morris, Alfred P.	0	10	6
,, Nickolls, James	0	5	0
Stowmarket, Simpson, T., and Son	0	5	0
,, Sutton, Charles William	0	5	0
Stratford-le-Bow, Howard and Sons	2	2	0
Streatham, Robinson, Chas. James	0	7	6
Strood, Picnot, Charles	1	1	0
Sunbury, Leare, James	0	5	0
Sunderland, Ritson, Thomas	0	10	6
,, Walton, John	0	10	6
,, Walton, Ralph	0	5	0
Sutton Coldfield, Smith, William	0	10	6
Sydenham, Pocklington, James	0	10	6
Tadcaster, Hammond, J.	0	5	0
,, Scholefield, W.	0	5	0
Taunton, Fouracre, Robert	0	10	6
,, Prince, Henry	0	10	6
Teignmouth, Cornelius, R. Bayly	0	5	0
Tenterden, Willsher, Stephen H.	0	10	6
Thame, Booth, Samuel	0	10	6
Thornton, Waddington, B.	0	5	0
Thornton-in-Craven, near Skipton, Wilson, Thomas	2	2	0
Tickhill, Yorkshire, Crowther, T.	0	10	6
Tiverton, Bond, L. V.	0	10	6
,, Norrish, Henry	0	10	6
Todmorden, Lord, Charles	1	1	0
Tonbridge, Millidge, Thomas E.	0	10	6
Torpoint, Down, Richard H.	0	10	6
Torquay, Gowen, Albert	0	10	0
,, Millar, F. C. Moss	0	5	0
,, Whiteway, W. H.	0	10	6
Torrington, Fowler, Henry	0	5	0
Tregroes, Evans, David	0	10	6
Tring, Chapman, John	0	10	6
Troedyrhiw, Jones, Wm.	0	5	0
Tunbridge Wells, Delves, George	0	10	6
,, Howard, Richard	0	10	6
,, Sells, Robert James	0	10	6
Tunbridge Wells, Gardner, Charles	0	10	6
,, Dunkley, Edward	0	5	0
Twickenham, Bishop, Thomas	0	10	6
Ulverston, Cooper, William	0	2	6
Uttoxeter, Johnson, John B.	0	10	6
Wakefield, Duffin, Thomas	0	5	0
,, Gissing, Thomas W.	0	10	6
,, Taylor, John	0	10	6
Wallingford, Payne, Sidney	1	1	0
Walmer, Peake, James	0	10	6
Walsall, Simpson, Thomas	0	5	0
Walsham, North, Bailey, G. W.	0	5	0
Walsham-le-Willows, Wilson, Thomas	0	5	0
Waltham Abbey, Marshall, James A.	1	1	0
Walton-on-Thames, Power, Edward	0	10	0
Wandsworth, Nind, George	0	10	6
Warrington, Webster, Samuel M.	0	10	6
,, Whitby, John	0	5	0
Waterloo, Pheysey, Richard	1	1	0
Watford, Chater, Jonathan and Son	1	11	6
,, Oldfield, Henry	0	10	6
Weaverham, Manifold, John J.	0	10	6
Wellingborough, Thorne, John	0	10	6
Welwyn, Lawrance, E.	0	11	0
Weymouth, Groves, Thomas Bennett	0	10	6
Whitchurch, Bailey, John B. (*Cole Henleigh*)	0	10	6
Wimbledon, Collier, James	0	5	0
Winchcombe, Plowman, Philip	0	5	0
Winchester, Powell, Edward	1	1	0
Windsor, Boyce, John Pierce	0	10	6
,, Collins, H. G.	0	5	0
,, Crook, E.	0	10	6
,, Grisbrook, E.	0	10	6
,, Leigh, John	0	10	6
,, Russell, Charles J. L.	0	10	6
,, Weller, George	0	10	6
Wolverhampton, Turner, William	0	2	6
Woodbridge, Betts, John	0	10	0
Woolwich, Parkes, John C.	0	10	6
,, Rastrick, John A.	0	10	6
Worcester, Witherington, Thomas	1	1	0
Worksop, Scaife, Christopher Thomas	1	1	0
Wrexham, Rowland William	1	1	0
Wyke, Drake, William	0	2	6
Wymondham, Skoulding, William	0	5	0
Yarmouth, Bond, John	0	5	0
,, Mabson, William	1	1	0
,, Walpole, William	0	10	0
Yeovil, Manning, T. D.	1	1	0
,, Manning, T. D., jun.	1	1	0
York Town, Wickes, Charles	0	10	6
Yspytty, Davis, Thomas	0	7	6

DONATIONS.

	£.	s.	d.
A Friend, per Mr. Darby	1	1	0
Balcomb, John, Cheltenham	2	2	0
Buck, J. E., Haverhill	0	10	0
Chemists' Ball	1	1	0
Clayton, F. C., Birmingham	0	10	6
Enser, J. L, Semer	3	13	6
Fisher, Charles, Ramsgate	5	5	0
Gibbs, William, Ryde	0	10	6
Hardacre, Henry, Hadleigh	0	10	6
Heanley, Marshall, Peterborough	2	2	0
King, F. R. M., Gorleston	2	2	0
Lacey, R., North Walsham	0	3	0
Lescher, F. H., Bartholomew Close	2	10	0
Mellin, Joseph P., Wimbledon	5	5	0
Pellow Brothers, Bude	1	1	0
Pininger, W. R., Ryde	1	1	0
Pyne, Joseph J., Manchester	3	3	0
Saner, James, per Mr. S. U. Jones, Leamington	5	5	0
Stewardson, Henry, Bedford	0	10	0
Smallwood and Son, Macclesfield	1	1	0
Taylor, T. and F. J., Newport Pagnell	5	5	0
Usher, J. L., Trowbridge	1	1	0
Wink, John A., Edinburgh	1	1	0
Wynn, Frederick, Horsforth	0	10	6

	£.	s.	d.
Bancks, Alfred, Cowes	1	1	0
Barber, F. H., Worcester	1	1	0
Callaway, Lemuel, Ipswich	2	2	0
Felthouse, Charles, Tamworth	1	1	0
Finch, Joseph N., Swansea	1	1	0
Hayles, Benjamin, Ealing	0	10	6
Horton, H. W., London	0	10	6

BOOKS RECEIVED.

CHUBB'S POISON ORDERS, in compliance with Schedule A, Part I. of the "Pharmacy Act." 1868.

This useful arrangement is not intended to supersede Poison Books, but to enable persons at a distance who are known to chemists, to obtain poisons by sending a messenger, instead of by personal application.

MANUAL OF MATERIA MEDICA AND THERAPEUTICS, EMBRACING ALL THE MEDICINES OF THE BRITISH PHARMACOPŒIA, etc. etc. By ALEXANDER MILNE, M.D. Second Edition. Edinburgh: E. and H. Livingstone.

THE MEDICAL AND SURGICAL REPORTER. Edited by S. W. BUTLER, M.D., and D. G. BRINTON, M.D.

PHILADELPHIA AND NEW YORK. 7 Parts. January and February, 1869.

NOTE ON THE SO-CALLED CARBOLIC ACID, OR COAL-TAR CREASOTE, AND ON RHUBARB. By EDWARD B. SQUIBB, M.D. Philadelphia, 1869.

TO CORRESPONDENTS.

Persons having seceded from the Society may be restored to their former status on payment of arrears of subscription and the registration fee of the current year.

Those who were Associates before the 1st of July, 1842, are privileged (as Founders of the Society) to become Members, and by virtue of membership to be registered as *Pharmaceutical Chemists.*

The Secretary and Registrar desires to intimate that no anonymous communications, or letters signed with initials only, will be answered.

Pharmaceutical Ethics.—To the Editors of the Pharmaceutical Journal,—Gentlemen,—The suggestive letter of your able correspondent, Mr. Giles, in last month's Journal, induces me to offer my own brief contribution to a solution of the problems therein referred to. 1st. As regards the poison section of the new Pharmacy Act. Increased and lengthened inspection of its working proves that in many respects it is open to grave exception. The unwisdom of requiring an ounce of paregoric to be labelled "*Poison*" is too evident to require enforcement by argument; but that opium and *all* its preparations should have been altogether omitted (except insisting a poison label to be attached to the more potent), will probably be considered more debateable ground. Yet I take this to be another proof of the inconvenience, nay, positive harm done, when special legislation in technical matters is attempted by "externs"; whilst at the same time it furnishes another proof of the advantage which would result from a special representation of classes in the House of Commons. A man well versed in the actual active working of our trade, would not only have challenged many assertions made in the course of the debate, but would have thrown the weight of his practical knowledge into the right scale. Laudanum, paregoric, syrup of poppies, and Godfrey's cordial, have been sold in villages remote from towns by respectable men, who, with their ancestors, have conducted such businesses for very many years with safety and advantage to the public. It is absurd to ask or expect such men to register; in truth, the aim of recent legislation is that they should not; but then, how about the public advantage, the ground of appeal so much made of, in connection with this legislation? There are villages in this district ten and twelve miles distant from a town in which dwells a registered man, communication with the said town and chemist existing once or twice a week by means of a carrier. Here is a case of undeniable inconvenience and hardship to the population of villages so situated. 2. The propriety of the admixture of miscellaneous trade with pharmacy proper is a moot question. I agree with your correspondent, "it must be determined by the good sense and good feeling of the individual pharmaceutist with reference to the specialities of his case." In this lies the only true solution of the difficulty. The patrician order of our body has very often and very eloquently stated ITS case in the pages of the Journal; some of us not so highly favoured,

conducting, it may be, a good provincial business in all its admixture and variety of operations, *we* feel that our patrician brethren are not in a position to understand our case. Undoubtedly pharmacy should have our first and best love. The arrangements in regard to the dispensing should ensure accuracy and efficiency; the repute of the principal for ability and a thorough acquaintance with his calling should be such as to command the confidence of the public; but, unless the public will obligingly swallow as much physic as will maintain his status and repay him for his educational outlay, he is compelled to "go in" for the Sunday trade. It is true the need for this admixture is not so great in a good thriving agricultural district, cattle medicines in all their variety forming an important and legitimate source of income. Granted that it is desirable to raise the educational standard of pharmaceutists, and present a lofty ideal to their imagination, it is none the less true that the majority are called upon to spend their lives in attention to matters which the proprietors of select pharmacies would deem *infra dig.* Whilst discoursing on this head of pharmaceutical ethics, I cannot but express the fear that we have far more to apprehend in the future from the reduction of prices through excessive competition. I am quite aware this is a matter beyond the reach of legislation, for this very reason ought the voice of condemnation to be strong and clear through those media we possess for expressing the same. 3. Mr. Giles refers "to the unsatisfactory position of apprenticeship." That the difficulty exists there can be no doubt. First-class houses increasingly decline the responsibility, and youths are remitted too often for their training to establishments unable to furnish either knowledge or discipline. The cause or causes for this state of things shall form (with your permission) the subject of another communication. One word as to the remedy, and I have done. That the term of apprenticeship might with advantage be reduced to three years, I have no doubt. In that case, however, it would be highly desirable a youth should have a thoroughly liberal and prolonged school education, and not commence his business training until he had reached his sixteenth or seventeenth year. Graver obstacles stand in the way of Mr. Giles' second suggestion. I refer to non-residence in the house of business. Out-door apprenticeship, for the most part, would be practicable only in those instances where the youth had his home in the same town. Two objections present themselves, viz. the cost of such arrangements, and the want of that moral influence and supervision which every thoughtful man would consider in placing out his son. With the first of these difficulties your correspondent deals. I do not think it would be so readily met as he supposes, unless we draw our apprentices from a wealthy class in society. And then, as to the moral culture of our youth, this is a question of primary importance to every employer. That the consciousness of responsibility in this particular exists, and existing, deters many competent men from taking apprentices, will be readily admitted. Still, it is a responsibility which must be accepted by some one whilst human nature remains what it is. A lad of seventeen in lodgings, away from all controlling influences, when the hours of business have closed, is not likely to mature into the assistant your advertising sheet reveals is still in request. —I am, yours truly, S. R. Atkins, *Salisbury, March* 11, 1869.

The Modified Examination.—To the Editors of the Pharmaceutical Journal,—As by virtue of the "Pharmacy Act," all assistants who are twenty-one years of age are compelled to pass the Modified Examination, and all apprentices and assistants under twenty-one must necessarily pass the Minor, perhaps you will not consider it out of place if I say a few words upon the subject of examination. And firstly, touching the Modified Examination, I think the majority of assistants will grant that it is particularly simple and easy, which every young man laying claim to an acquaintance with the business of a Chemist and Druggist, ought to pass with ease; yet it is with some surprise that we find a number of those who go up for this Modified Examination, fail to pass. Consequently we are led to ask, How a young man who has attained the age of twenty-one has been employing his valuable time that at the end of his apprenticeship he is not able to distinguish and name even the commonest pharmaceutical drugs? What a deplorable condition for a young man to be placed in! But now the day has dawned, the candles of night are burning low, and the sun is just beginning to dawn, and will soon shine out gloriously, dispersing the clouds which now hang over the minds of those who ought, by virtue of their profession, to be educated men. In all study it is of the utmost importance to know what to study and how to study, for without first being

determined and clear upon these points, we may wander over the whole of the sciences and collateral subjects, ultimately to find that we have learned comparatively nothing, and have wasted valuable time. Now the examinations of the Pharmaceutical Society is the object which all pharmaceutical students should keep in view; but not, of course, to be looked upon as an ordeal which we are to get through the best way we can, but as the beacon to guide us on our course. What we have to study are the subjects stated in the synopsis of the examinations; and in order to prepare ourselves to appear before the board of examiners in a creditable manner, we must be ever mindful in all we do to be, as Mr. Brady very appropriately says, "thorough." If the foundation is well and thoroughly laid, the superstructure which is reared upon it will be substantial and enduring; therefore it should be the aim of every student to build a firm and solid foundation upon which to rear his temple of knowledge; and the best way to do this is to thoroughly inculcate the mind with first principles, to be careful to master and comprehend each fact as it comes under notice, and to proceed on systematically. The progress may be slow, but better be slow and "thorough" than swift and superficial; for a few facts well learnt, and a few principles well grounded in the mind, thoroughly repay all the time and labour spent in their acquirement. Thus if the student proceeds on step by step, overcoming each difficulty as it rises before him, he will ultimately be able to pass the examinations of the Pharmaceutical Society, and be worthy the name of Pharmaceutist.—I remain, yours obediently, AMYGDALUS.

Sale of Poisons.—Sir,—I read with much interest your sensible article under the above head in last month's Pharmaceutical Journal; it shows how thoroughly you have comprehended this subject, with all its difficulties. As one of the earliest, if not the earliest, public writer,—having advocated some restriction on the sale of poisons through the powerful journals with which I have been connected,—I wish to express my views on some portions of the new Pharmacy Bill, writing, as I do, from a portion of England seriously affected by the new law, and having very great experience in the drug trade. I will add, *en passant*, it is felt as a sore grievance that the clause in the Bill of 1865, which did not require the registration of those persons who had been carrying on business as druggists, should have been struck out. The country druggists are a well-defined class, and meet a demand in their respective localities; this Bill would have precluded the hucksters, and the old country druggists would have been allowed to quietly die off. This Bill was circulated through the country; our county member, Sir John Trollope, knowing the interest I took in the subject, sent me a copy of the Bill for comment. I was satisfied with it. I confess that I was taken by surprise at the end of last year to find that the Amended Bill had taken a tremendous leap, disregarding the interests of a very numerous and respectable body of men, who have been taken by surprise. You rightly regard the restriction on the sale of opiates as an unfortunate addition; how does this appear to us, living in a district where opiates are more than a necessary of life!—food and raiment being only secondary considerations with large portions of the people. *Necessitas non habet legem:* the people *will have their opiates.* I can travel from my parish for ten, twenty, or even thirty miles, covered with a thriving population of agriculturists, with hamlets, farmsteads, and villages, where opiates are required in immense quantities on emergencies for stock, and to satisfy the wants of those addicted to the use of the fascinating drug. Where a few weeks ago, there were lots of old drug-stores to accommodate the locality, the ordinary traffic is destroyed. Can we suppose for a moment that this vast tract of country has suddenly ceased to use opiates—as it must of necessity do, to a great extent, if the law were strictly obeyed? Certainly not; the forbidden drug is clandestinely smuggled into the district in every conceivable form. No law can prevent this; the old midwife, who first finds her account in getting a commission to gather up the empty laudanum bottles, and get them replenished at some far-off market-town, soon learns that by the outlay of a little capital there is a rare opening for a thriving trade, which may be carried on with perfect impunity. She knows her customers, and their urgent wants. The various ways in which the law is evaded are too numerous to detail; one will give opiates away, with some understanding of charging on other articles. The vendor who offers "non-poisonous paregoric" is no fool; his advertisement is a just rebuke. "The opiate mass," with patent medicine stamp, is a clumsy evasion; but how are we to get over "Smith's Sedative," if it is sheltered by the patent medicine stamp? By the way, the sale of

patent medicines has greatly increased in these districts; the people, having more difficulty in obtaining opiates for coughs, etc., are driven to purchase sedatives, sold as patent medicines. I believe the Act is unnecessarily severe and penal. I am not surprised to see your remark, that many have applied to be registered who are not qualified, and some may have obtained the certificate who can have no pretensions to qualification. Is this to be wondered at? These men would have no idea of fraud; they would not be aspiring to dabble in a dangerous profession, beyond their knowledge. They would be attempting to hold what they considered their own,—to carry on the trade which they and their fathers had done. But these, you say, can be purged out by local secretaries. I confess, after the drastic purge which this unfortunate class have had to submit to, I should rather like to see restoratives offered; I would rather see some of these old traders replaced. We may go on purging too far; the great qualities required in the drug trade are carefulness, personal attention, intelligence, and common sense; the purging system hinted at, if not carefully watched, will afford opportunity for petty jealous minds to harass those who may be superior to themselves, through taking advantage of some portion of the hasty Act of Parliament under consideration. Upon the whole, the Bill is a great step in the right direction, but too precipitate, too penal, and too regardless of established interests.—Yours, etc., "A Lincolnshire Fen Druggist."

Pharmaceutical Ethics from a Practical Point of View.—To the Editors of the Pharmaceutical Journal.—Gentlemen, I cannot help feeling that some of my West-End brethren and a fortunate few, living in favoured and fashionable *localities*, when writing on the "yclept Pharmaceutical Ethics," do so from a point of view that is rather special than general, and that their ideas, charming though they may be, can only be considered as the "ideal poetry" of Pharmacy, and not its real life; the standpoint they take is doubtless a most desirable one, but, from circumstances beyond their control, thoroughly impracticable, except in very few cases. They hold that a chemist's legitimate calling is the dispensing physicians' prescriptions and the selling of drugs and chemicals only (of course not excluding the higher branch of scientific chemistry-analysis, etc.), and that the hair-wash, cosmetique, tooth and nail-brush, sponge and toilette article department are alike derogatory and degrading to the position and *status* of the trade. Now, to state this is one thing, to act on it quite another, and I cannot help thinking it an ungenerous castigation to a very large and respectable body of the trade. How many men are there in all England that would contemplate with serene satisfaction *their annual returns*, as realized by the dispensing and drug sales alone, unaided by the "degrading elements"? The reason of this is extremely simple, viz. the Custom of the Country! As a rule, in the provinces, in cases of sickness, they call in the general practitioner, and, in the majority of cases, he supplies all medicines; and there are hundreds of country businesses doing good returns, from £1000 to £2000 a year, that would not average two new prescriptions daily, and a very great number not one daily. In many localities there is no such thing as a physician, at least practising as such, many may hold the M.D. diploma, but practise as surgeons, therefore the country chemist has but a poor chance of doing a dispensing trade; he may supply the domestic materia medica, and feel he would like to confine himself strictly to medicine and its direct attributes, but inexorable experience soon tells him that to do so may be to gain the empty title to respectability at the expense merely of the means wherewith to maintain it, and that is extremely inconvenient, especially if married and a family to support. What a chemist does, under the circumstances, is the most natural thing in the world; to coin an expression, he radiates with or by means of the infinite number of substances in his shop, and his knowledge and experience suggest combinations, if not absolutely for healing the sick, at any rate are made necessary or desirable in this age of artificial refinement; and I cannot help thinking that the gain is not only to the chemist, but that the public are also benefited through his practical training and knowledge of the substances dealt in. Few persons will gainsay but that at this present time the education of the trade is making favourable head, and that the fault is *not* theirs, that the surgeons are to a great extent the purveyors of medicines to the million; the chemists as a class, are fully competent and prepared to discharge that duty, as much so as our neighbours across the Channel, but so long as the medical men of this country elect to be their own dispensers, so long must the country chemist aid his returns with extractum carnis,

dietetic farina, proprietary nostrums, and perfumery, etc.; and as the whole or nearly the whole of the trade do so, it is a pretty clear indication that it is necessary as an adjunct to strict pharmacy, and as our Gallic friends would say, "*Reculer pour mieux sauter.*"—I am, gentlemen, yours, etc., WILLIAM HENRY TUGWELL, 3, *Lewisham Road, Greenwich.*

Edward W. Holme (Plymouth).—*Aconitum Anthora.* See Miller's 'Gardeners' Dictionary,' vol. i., and Gerarde's 'Herbal,' p. 969.

Botanist (Brighton).—The new edition is announced to be ready on the 1st of May.

C. B.—(1.) See vol. x. (N.S.) p. 111; (2.) vol. vii. (N.S.) p. 34.

T. C. (Liverpool).—*Antidote to Snake Poisons.* Our correspondent will find that the remedy he describes is noticed in our article on "Snake Poisons," in the March number, p. 548.

"*Chemicus.*"—The MINOR Examination will be necessary.

A. (Bedford) (1) wishes to know "how *Oxymel Scillæ* is made quite bright;" (2) *Liquor Pepsinæ* (Squire),—℥i of Boudault's pepsine, dissolved in ℥i of distilled water: a little salt to be added as a preservative.

A. R.—No.

"*Local*" is referred to the Registrar, 17, Bloomsbury Square.

"*Hydrarg.*"—*Balsam Copaiba.* See vol. vi. p. 13, and vol. vii. (N.S.) p. 326.

T. M. (Nottingham).—The Minor Examination.

H. S. (Stalybridge).—It is desirable in the interests of the public, that such articles should be registered.

"*Delta.*"—We think that the patent medicine stamp would be unnecessary in this case.

"*A Registered Apprentice*" (Atherstone) wishes to know "the best means of destroying ants which frequent houses."

"*A Registered Apprentice*" would be eligible.

J. G. (Lichfield).—(1.) Yes. (2.) No. The subjects would be included in the Minor Examination. (3.) Apply to the Secretary, Museum of Practical Geology, Jermyn Street.

"*Ut Antea.*"—In the prescription referred to, if the ingredients are mixed in the order indicated, and, after standing for a short time, the bottle be briskly shaken, a thick creamy liniment is the result.

"*A Subscriber*" (Dumfries) (1) wishes to know "how to make crystallized cream, with large crystals;" (2) *Glycerine and Lime Cream*, vol. viii. (N.S.) p. 679.

X. (Yeovil).—(1.) "Kokune oil:" for a description of this oil, its properties and uses, see vol. ii. (N.S.) p. 282. (2.) Royle's 'Manual of Materia Medica.'

Mr. Lewin (America) is thanked for his communication, and *Mr. E. Brown* (Leeds) for his suggestion.

"*Hereford.*"—Our correspondent will see by sect. 16 of the new Pharmacy Act, that all his rights as a member of the Royal College of Veterinary Surgeons are reserved; a reference to the Royal Charter of Incorporation of the College of Veterinary Surgeons will show what those rights are.

R. E. H.—(1 and 2.) No; he will be eligible to become an *Associate.* (3.) No.

M. (Stroud).—The result alluded to must be caused either by the use of weak spirit, or by the first and last part of the distillate not having been mixed. The stronger spirit comes over in the first part of the process, leaving that which follows too weak to hold the oils in solution until the whole is mixed together.

Instructions from Members and Associates respecting the transmission of the Journal before the 25th of the month, to ELIAS BREMRIDGE, Secretary, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Messrs. CHURCHILL, New Burlington Street. Other communications to the Editors, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. X.—No. XI.—MAY, 1869.

THE ADULTERATION OF DRUGS.

The Bill now before Parliament "To Amend the Adulteration of Articles of Food or Drink Act, 1860, and to Extend its Provisions to Drugs," demands the serious consideration of Chemists and Druggists. It will be found in another part of this Journal, in the form in which it was introduced by Mr. Dixon, and ordered to be printed on the 13th of April.

It is admitted on all hands that the adulteration of articles of food and drink and also of drugs, is practised to a considerable extent, and that existing laws are practically inoperative as efficient remedies for the evil.

It is generally admitted that this is a fit subject for legislation, the interests of all classes of the community being involved in the suppression of adulteration, and especially when it affects the health or the pockets of the public.

That it is a difficult subject on which to legislate may be inferred from the small success of the attempts that have been made in that direction.

According to the Act of 1860, "every person who shall sell any article of food or drink with which, *to the knowledge of such person*, any ingredient or material injurious to the health of persons eating or drinking such article has been mixed, and every person who shall sell, *expressly warranted as pure or unadulterated*, any article of food or drink which is adulterated or not pure," shall be subject, for a first offence, to a penalty not exceeding five pounds nor less than five shillings, and for any subsequent offence may have his name advertised.

Parochial and other local authorities are authorized, *if they think proper*, to appoint analysts in their respective districts, and *may* pay to such analysts such *salaries* or *allowances* as they may think fit; and it is the duty of these analysts to examine any articles of food or drink that may be taken to them for that purpose, and to report thereon, for a fee of not less than two shillings and sixpence, nor more than ten shillings and sixpence.

Persons who have reason to believe that articles which they have purchased are adulterated in either of the ways specified, may have them examined by the analysts, on payment of the fees named, and finding their suspicions to be substantiated, may make complaint before justices, etc., with a view to the infliction of the penalties.

The Act of 1860, when passed, was not made to apply to drugs, but by the 24th section of the Pharmacy Act of 1868, it is provided that "the Act for Preventing the Adulteration of Articles of Food or Drink, shall extend to all articles usually taken or sold as medicines, and every adulteration of any such article shall be deemed an admixture injurious to health; and *any person*

registered under this Act, who sells any such article adulterated, shall, unless the contrary be proved, be deemed to have knowledge of such adulteration."

The sale of drugs was thus, last year, made amenable to the same law, affecting adulteration, as applied to food or drink; but it was not expected that much benefit would result from this, as the Adulteration of Food Act of 1860 had proved a complete failure in regard to food, and was not likely to be more successful in regard to drugs. At the time of the passing of the Act we predicted that it would be inoperative, and the prediction has been fully verified.

The principal causes of the failure of the Act of 1860 appear to have been the following:—

1. That persons selling articles adulterated with ingredients injurious to health, cannot be easily proved to be cognizant of the fact, indeed they are most likely to remain purposely ignorant of it; and persons selling articles known to be impure or adulterated, are not likely *expressly to warrant* them to be *pure*.

2. That local authorities either *do not think proper* to appoint analysts, or they appoint them with such *inadequate remuneration* that the public do not get efficient benefit from their services.

3. That the public are indisposed to appear as prosecutors in such cases.

On these accounts the Act of 1860 has remained practically inoperative, and the object of the Bill now before Parliament appears to be to render the law available for the purpose for which it was originally intended, and to retain the application since given it to the sale of drugs.

It is proposed to make the Act applicable to two classes of offences; firstly, those which consist in adulterating articles of food or drink, or drugs, by adding to the former any "injurious or poisonous ingredient or material," and to the latter *any* ingredient or material intended to adulterate it; and secondly, those which consist in selling articles of food or drink which, to the knowledge of the seller, have been adulterated so as to be injurious to health, and in selling as pure and unadulterated, articles of food or drink, or drugs, which are found to be adulterated or not pure.

For the first class of offences, the penalty, on the first conviction, is the payment of a sum not exceeding *fifty pounds*, and on the second conviction, *six months' imprisonment with hard labour*.

For the second class of offences, the penalty, on the first conviction, is the payment of a sum not exceeding *twenty pounds*, and on subsequent conviction, the publication as an advertisement of the name and offence of the offender at his own cost.

In order to make the Act effective for the accomplishment of these objects, several alterations are proposed to be made in the mode of putting it into operation.

The appointment of analysts, instead of being voluntary, is to be compulsory in the several districts throughout Great Britain and Ireland, and the appointments are to be subject to the approval of the Secretary of State.

Commissioners are also to be appointed by the Government "to confer with and assist the local authorities in carrying out and enforcing the Act."

Then, instead of leaving it to the general public, who purchase what they suppose may be adulterated articles, to find out the adulterations and to prosecute those who have been illegally engaged in the transaction, these duties are thrown upon the inspectors of nuisances or other officers appointed by the local authorities. These paid officers having, with the aid of the analysts, discovered the existence of adulteration and the nature of it, are to take summary proceedings against the parties implicated. By proceeding thus in a systematic way, and exposing all cases of adulteration such as are recognized by the law, the dealers in any district may be speedily deprived of the power of pleading ignorance of the facts, and may thus be made amenable to the law.

The public, as purchasers, will still be authorized to have articles examined by the analysts on payment of a small fee.

These appear to be the most important provisions of the proposed measure; and although some modifications might perhaps be made with advantage in a few of the details, the Bill would no doubt provide efficient means of making the law available for the purposes contemplated.

THE SANDFORD TESTIMONIAL FUND.

The subscription list to this fund having been closed, in accordance with a resolution passed some time ago by the Committee, a meeting was held on Monday, the 19th of April, to decide on the manner of applying the amount which has been raised. It had been previously arranged, in the event of the fund being sufficient, that the testimonial should consist of a portrait of Mr. Sandford, President of the Pharmaceutical Society, and a service of plate, to be presented as a mark of the high appreciation which has been formed of the valuable services which he has rendered to the Society. The amount of the subscriptions was found to be ample for the accomplishment of these two objects, and a Committee was therefore appointed to carry them into effect at as early a period as possible. The service of plate will be presented on Wednesday, the 19th of May, at 3 P.M., in the Theatre of the Pharmaceutical Society, after the Anniversary Meeting of the Society.

It is proposed that in the evening of the same day there shall be a dinner to celebrate the occasion, at the Freemasons' Tavern, Great Queen Street, Lincoln's Inn Fields, at which Mr. Sandford will be the honoured guest.

PHARMACY ACT AMENDMENT BILL.

This Bill passed the second reading on the 6th of April, without alteration or remark. It stands for Committee on Thursday, the 29th of May, and it is expected that some additions will then be made in it.

TESTIMONIAL TO DR. ODLING, LATE HONORARY SECRETARY TO THE CHEMICAL SOCIETY.

A very gratifying recognition of the valuable services which for several years have been gratuitously rendered to the Chemical Society by one of the most able, zealous, and accomplished of its members, took place at the Albion Hotel, in Aldersgate Street, on Tuesday, the 20th April, when a large number of the past and present members of the Council of the Society invited Dr. Odling to a complimentary dinner, at which they presented him with a handsome silver cup ("loving cup"), which the Chairman, Dr. De la Rue, handed to him amid the hearty congratulations of his numerous friends. There is no man in the Chemical Society who, during the last ten or twelve years, has exerted a more important and beneficial influence in raising the scientific character of the Society, than has Dr. Odling, and he richly deserves the mark of esteem and admiration which his late colleagues have so handsomely conferred upon him. Dr. Odling is an honorary member of the Pharmaceutical Society.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *April 7th*, 1869,

Present—Messrs. Abraham, Bottle, Bourdas, Brady, Carteighe, Deane, Evans, Haselden, Hills, Ince, Mackay, Morson, Orridge, Sandford, Savage, Squire, and Williams,

The following Pharmaceutical Chemists were elected

MEMBERS.

Barbar, William James, Manorbere.
Bourdas, John, London.
Buss, Thomas Sargent, London.
Corner, Robert, West Hartlepool.
Gregory, Thomas, Holywell.
Judson, William, High Wycombe.
Keene, John, London.
Scllcck, Edward, London.
Silvester, Henry Thomas, Knutsford.

The following, having paid their arrears and subscriptions for the current year, were restored to Membership:—

Jackson, William, Liverpool.
Jones, Thomas J., Newport, Monmouth.

The following Chemists and Druggists, registered under the "Pharmacy Act, 1868," were elected

MEMBERS.

TOWN.	CHRISTIAN & SURNAME.
Alford	Robinson, William.
Altrincham	Townson, Timothy W.
Ashford	Ingall, Joseph.
Barnsley	Badger, Alfred.
Beckenham	Day, Thomas Sweeting.
Benfleet	Harridge, Alfred Fitch.
Billinghay	Peach, William Walter.
Bilston	Green, John George.
Bradley Green	Woodstock, Charles E.
Brighton	Harris, Edward R.
„	Else, William.
Briton Ferry	Jones, Morgan H.
Bromsgrove	Haines, John Jenkins.
Burslem	Guest, George C.
Caermarthen	White, John Davies.
Canterbury	Bird, David Landen.
„	Gardner, Austen W.
Cirencester	Smith, Charles S.
Cleobury Mortimer	Evans, Edwin E.
Colsterworth	Wing, Samuel W.
Croydon	Crafton, Richard F.
Dartmouth	Cutcliffe, George John.
Eastbourne	Provost, James Ashton.
Erith	Bryant, John Tripp.
Faversham	Hunter, John.
Fishguard	Vaughan, William.
Glasgow	Davison, Thomas.
Gravesend	Smith, George Mason.
Greenwich	Howard, George.
„	Rubbra, Frank.
Harrogate	Taylor, Joseph H.
Hay	Stokoe, Thomas.
Highbridge	Hazard, James Dare.
Hogsthorpe	Robinson, Benjamin.
Horsforth	Wynn, Frederick.
Huddersfield	Bygott, William T.
Linlithgow	Waldie, George.
Liverpool	Thomas, Robert.
Liverpool	Williams, Hugh M.
Long Sutton	Kingerley, William S.
Lye	Jones, Rowland Gill.
Macduff	Henry, Andrew.
March	Vawser, Jesse.
Market Harborough	Scott, Joel.
„	Martin, William.
Mytholmroyd	Cockeroft, Richard.
Newcastle-on-Tyne	Swan, Jos. Wilson.
Newport, Monmouth	Price, George.
New Radford	Jenkins, John Thomas.
Newtown	Morgan, David.
Northleach	Howard, James H. H.
Norwich	Row, George.
Olney	Fever, William.
Pewsey	Higgins, John.
Reading	Starke, George.
Rochester	Andrews, George J.
Rye	Walters, William A.
Sheerness	Prosser, David.
Sheffield	Burnell, John S.
St. Leonards-on-Sea.	Thomas, Horace.

TOWN.	CHRISTIAN & SURNAME.
Stratford, Essex	Halford, Thomas C.
Streatham	Robinson, Charles J.
Swansea	Finch, Jos. Newman.
Tadcaster	Scholefield, William.
Tamworth	Felthouse, Charles.
,,	Morgan, George.
Thrapston	Pars, Robert Corelli.
Torquay	Yates, William Lee.
Trowbridge	Hayward, William H.
Walsall	Humphries, Charles.
Warminster	Humby, Lewis W.
Weymouth	Mason, Arthur.
Whitstable	Goulden, Herbert T.
Wimbledon	Mellin, Jos. Phillips.
Wolston, nr. Coventry	Davis, Robert Samuel.
Wolverhampton	Pratt, Josiah.

LONDON.

Bate, H., 44, Thorne Road, South Lambeth.
Cruse, J. C., 27, Canonbury Pl., Islington.
Gardner, John, 167, Mare Street, Hackney.
Garnham, Albert W., 12A, Wellington St., Southwark.
Goddard, George, 21, Walworth Road.
Grosvenor, Thomas Caddick, Old Brompton Road, South Kensington.
Haynes, Charles Hammond, Bayswater.
Hunt, James, 24, Exmouth St., Clerkenwell.
Ive, W., 2, Stanhope Ter., South Kensington.
Julcr, Richard R., 200, Essex Rd., Islington.
Lance, W. N. G., 207, Copenhagen St., N.
Norburn, A. H, 92., St. John's Rd., Hoxton.
Parry, C.D., 12A, Wellington St., Southwark.
Parry, W. P., 148, King St., Hammersmith.
Preston, Alfred, 88, Leadenhall St., E.C.
Richardson, James, 448, Kingsland Road.
Ringrose, George, 123, St. George's St. East.
Simpson, H., 5, Hanover Pl., Regent's Pk.
Smith, W. C., 36, Broadway, Hammersmith.
Spink, H. N. B., Marsham St., Westminster.
Stansfield, Richard, Haverstock Hill.

ERRATA.—Page 565, first column, line 4, *omit* Hay . . . Hadley, Benjamin.
line 20, *omit* Liverpool . Strawson, Vincent.

BENEVOLENT FUND.

A grant of Ten Pounds was made to the daughter of a late Member at Southampton.

EXAMINATIONS IN LONDON.

April 2nd, 1869.

Present—Messrs. Bird, Carteighe, Cracknell, Darby, Davenport, Deane, Evans, Gale, Garle, and Haselden.

MODIFIED EXAMINATION.

Fifty candidates presented themselves; the following thirty-one passed, and were duly registered as

CHEMISTS AND DRUGGISTS.

Adams, William John, Cheltenham.
Attwell, Arthur, London.
Babb, Albert, Bristol.
Barlow, George Edward, Liverpool.
Barnett, Thomas James, Northampton.
Chapman, Henry, Norwich.
Cleaver, Edward Orlando, Croydon.
Cox, Edwin Joseph, Bath.
Dawes, Herbert, Bicester.
Downing, James Henry, Llanelly.
Evelyn, William Francis, Richmond, S.W.
Gall, Frederic, Devizes.
Green, John Ayre, Norwich.
Hedley, James, Manchester.
Hollands, Francis Edward, London.
Hollway, Albert, Cardigan.
Jones, David Williams, Aberdare.
Jones, Owen, Liverpool.
Love, George Jex, Clare.
Metcalf, Benjamin, Retford.
Millington, Edward, Brighton.
Nayler, Joseph, Bow.
Percy, Hugh, Leamington.
Proudfoot, William Henry, Sunderland.
Raynor, Alfred, Hull.
Scott, Thomas, Cheltenham.
Smith, Herbert George, Bath.
Southern, Joseph, Buxton.
Sowray, Joseph, New Malton.
Turner, William Henry, Margate.
Williams, William Jones, London.

April 16th, 1869.

Present—Messrs. Bird, Carteighe, Cracknell, Darby, Davenport, Deane, Edwards, Evans, Gale, Garle, Haselden, and Southall.

MODIFIED EXAMINATION.

Forty-nine candidates presented themselves for Examination; the following twenty-six passed, and were duly registered as

CHEMISTS AND DRUGGISTS.

Barnes, Benjamin, Sternfield, Saxmundham.
Blount, Frederick Charles, Cheltenham.
Bowles, William James, London.
Breton, Harvey Wolstenholme, London.
Brown, Thomas Henry, Leicester.
Crosby, Edward, Hunslet.
Davies, John Richards, Worcester.
Fawthrop, James, Yeadon.
Harold, Edward Charles, Tenterden.
Hudson, Thomas Frederick, Birkenhead.
Lees, Thomas, Brighton.
Parnell, James B., Bridgnorth.
Peacock, George, London.
Platt, William, Everton.
Rees, John, Chester.
Sanders, Thomas, Banbury.
Scrase, Richard, Hammersmith.
Smith, William Henry, Cheltenham.
Snook, Joseph John, London.
Stanley, Alfred George, London.
Strutt, Samuel Shippam, Northampton.
Warne, John Martin, Sydenham.
Webb, George, Hitchin.
Whaley, Edward, Kingston-on-Thames.
Wiles, Edwin, Sheffield.
Witherington, Thomas James, Worcester.

April 21*st*, 1869.

Present—Messrs. Bird, Carteighe, Cracknell, Darby, Davenport, Deane, Gale, Garle, Hanbury, and Haselden.

Twenty-two candidates presented themselves for the Major and Minor Examinations; the following fifteen passed, and were duly registered:—

MAJOR (as Pharmaceutical Chemist).

Forbes, William Thomas . . . Reigate.

MINOR (as Chemists and Druggists).

Challice, Swann, London.
Chase, Thomas, London.
Cooke, Henry John, London.
Cussons, Thomas Tomlinson, Louth.
Darnill, Charles, London.
Goulden, Henry James, Walworth.
*Ingham, John, Lower Tooting.
James, John, Stoke-on-Trent.
Joseph, Arthur Iorwerth, St. Leonard's.
Mason, Robert William, Rugby.
Pattison, Frederick, Preston.
Rowell, Robert Henry, Newcastle-on-Tyne.
Smallman, Edward Briton, South Shields.
Swift, William Philip, Spalding.

REGISTERED APPRENTICES AND STUDENTS.

Name.		Address.
Bateman, John Montague	Mr. Paine	Canterbury.
Bowden, Thomas Lemon	Mr. Goss	Barnstaple.
Bracher, Walter Phipps	Mr. Ekin	Bath.
Buswell, Arthur	Mr. Hunt	Winchester.
Clarke, George Ernest	Mr. Gostling	Stowmarket.
Coker, George	Mr. Langford	King's Lynn.
Coles, William		Great Missenden.
Copp, Henry Arthur	Mr. Sprent	Reading.
Davies, Frederick	Mr. Hodges	Chester.
Dixon, Parry Ralph	Mr. Lidwell	London.
Eden, Thomas	Messrs. Anderson and Adams	Dublin.
Ekins, Arthur Edward	Mr. Beall	Cambridge.
Evans, Evan	Mr. Treharne	Cardiff.
Fairburn, Robert Walter	Mr. Siddall	York.
Felix, Edward	Mr. Williams	Cardigan.
Fletcher, Frederick William	Mr. Fletcher	Totton, Southampton.

* Passed in honours; eligible, at the end of the Session, to compete for the Prize of Books.

Name.		Address.
Greig, William		Sunderland.
Hitchcock, Edmund Tilley	Mr. Hitchcock	Oxford.
Holmes, Jasper Clement	Mr. Randall	Southampton.
Holroyd, Arthur	Mr. Gibson	Hull.
Jones, Richard Owen	Mr. Evans	Cardigan.
Jones, Robert Lloyd	Messrs. Parry and Jones	Denbigh.
Jordan, J.	Mr. Young	Newport, Monmouthshire.
Kinch, Charles	Mr. Kinch	Henley-on-Thames.
Laugher, William	Messrs. Hudson and Pershouse	West Bromwich.
Lewin, Edward Allen	Mr. Lewin	Boston.
Marriott, William Hudson	Mr. Mayger	Northampton.
Marsh, Edward Robert	Mr. Wellington	Oakham.
Marshall, Alfred	Mr. Broad	Hornsey.
Moore, Thomas Cooper	Mr. Badcock	Barnard Castle.
Newbery, Albert Edward	Messrs. Tanner and Sons	Exeter.
Newman, Alfred Douglas	Mr. Baker	Bayswater.
Page, William Hawkins	Mr. Cole	Colchester.
Palmer, Richard	Messrs. Allen and Willis	Lynn.
*Sargent, Obeithio	Messrs. Southall	Birmingham.
Selley, John	Mr. Turner	Aylesbury.
Steedman, Robert Thomas	Mr. Young	Newport, Monmouthshire.
Tame, Thomas	Mr. Luff	Oxford.
Thornton, John	Messrs. Canning and Keates	Birmingham.
Tryon, William Cutler	Mr. Tryon	Landport.
Wakelin, H. W.	Mr. Claranee	Colchester.
Watson, William	Mr. Stevens	Chatham.
White, William Charles	Mr. Curtis	Barnstaple.
Wood, Alfred Edwin	Mr. Bell	Berkeley.
Woods, Joseph Henry	Executors of Mr. Woods	Warrington.

EXAMINATION IN EDINBURGH.

April 13*th*, 1869.

Present—Messrs. Ainslie, Aitken, Brown, Buchanan, Kemp, Mackay, and Young.

REGISTERED APPRENTICES AND STUDENTS.

Brewis, Thomas, Rothbury.
Brown, John, Newcastle.
MacGeorge, William, Dumfries.
Mackinna, John, Dumfries.
Modlen, Robert, Edinburgh.

MODIFIED EXAMINATION.

Ten Candidates presented themselves; the following eight passed, and were duly registered as

CHEMISTS AND DRUGGISTS.

Bardsley, Joshua, Glasgow.
Crawford, George, Edinburgh.
Harries, Thomas, Llanelly.
Hetherington, Adam Johnstone, Moffat.
M'Naughton, James, Dumbarton.
Mortimer, David Alexander, Edinburgh.
Robinson, George James, York.
Spence, William, Edinburgh.

Erratum.—Page 571, line 20, an asterisk should have been prefixed to the name Cook, Thomas, he having passed the Major Examination with honours.

* This name should have appeared in December Journal.

PHARMACEUTICAL MEETING.

Wednesday, April 7th, 1869.

MR. G. W. SANDFORD, PRESIDENT, IN THE CHAIR.

DONATIONS TO THE LIBRARY AND MUSEUM

were announced as follows, and the thanks of the Meeting given to the respective donors:—

La Matière Médicale à l'Exposition de 1867: from Dr. J. L. Soubeiran. Conspectus or Tabular Synopsis of the British Pharmacopœia, 1867: from Mr. O. Davies Owen. Guy's Hospital Reports for 1868: from the Hospital. An old "MS. Receipte Boke": from Mr. Trant. Floræ Columbæ Specimina Selecta, edidit H. Karsten; tomi i. Fasciculus Primus: from Mr. J. E. Howard. The Quinology of the East Indian Plantations, by J. E. Howard, F.L.S., etc.: from the Author. Eleven dried specimens of *Cinchona*, seven of which being varieties of *C. officinalis;* specimen of bark received from Mr. Broughton, yielding 10 per cent. of quinine; three specimens of bark and wood of *Cinchona succirubra;* all from plants cultivated in the Government plantations in the Neilgherries, 1868: presented by Mr. J. E. Howard. Specimen of Black Beeswax, from Dr. Bidie, of Madras,—also sixteen dried specimens of Medicinal Plants: presented by Mr. Daniel Hanbury. Specimen of *Saloop misree* from India, probably the tubercules of *Eulophia campestris:* presented by Mr. Strickland. There was also on the table "A Cheap Poison Bottle," from Mr. Davies, Commercial Road East; its merit consisted in pasting a piece of sandpaper on the back of an ordinary bottle in addition to the usual "poison" label.

Mr. J. E. Howard, at the request of the President, made a few observations on certain specimens of cinchona bark cultivated in the East Indies, specimens of which were placed upon the table, and expressed a hope that at some future time he should have an opportunity of going more fully into the subject. He said that the number of varieties and species now cultivated in the East Indies was somewhat embarrassing, many of them being exact reproductions of the barks found in South America; whilst some varieties did not appear to correspond exactly with any that they were as yet acquainted with from South America. The subject, therefore, still required investigation among these new varieties. Mr. Broughton had quite recently found a variety which was quite new to them, possessing lanceolate leaves almost approaching in appearance to the *Cinchona lancifolia*, the bark differing entirely from the characteristic of the bark of the *lancifolia*, and pertaining more to that of the best species of Pitayo or of Loja. Mr. Broughton had found this variety to be so extraordinarily rich in quinine that he had obtained from it the almost incredible quantity of 10 per cent. of sulphate of quinine. Though this fact had only been communicated to him (Mr. Howard) in a letter from Mr. Broughton, there could not be any objection to his mentioning it at that meeting. He had himself examined a small portion of the bark, and his examination fully confirmed Mr. Broughton's analysis. This circumstance, together with other collateral observations, showed the great importance of attending with even minute accuracy to discrimination of the species and varieties which were already growing luxuriantly in the East Indies, some of which were so very much more productive than others. The neighbouring plants to that he had mentioned did not produce one-third of the amount of sulphate of quinine. In Mr. Broughton's last report he mentioned the circumstances connected with finding this species and his analysis of it, and he stated there that he had found 8·5 per cent. of sulphate of quinine, but since then he had obtained what he (Mr. Howard) had just mentioned. One specimen on the table was this extraordinarily rich bark. There was another specimen, which was the third harvest of bark renewed from the same tree, the *Cinchona succirubra*, or red bark of commerce. The bark had

been three times stripped from the tree and then renewed; and certainly it was greatly improved from the original bark. Some pieces of wood on the table were transverse sections of some of the trees of *Cinchona succirubra*, which had been stripped of their bark and had replaced it. They would observe the lines representing the first, second, third, and fourth growth, the old part contrasting with the appearance of the new.

Mr. HILLS asked whether the present specimens of bark yielded more quinine than was usually found in bark?

Mr. HOWARD said it appeared to him that the effect of cultivation was to increase the value of the product. There was one thing to be noticed, and that was that perhaps the quantity of cinchonidine was rather larger in East Indian bark than in Peruvian bark. The greater warmth and dryness of the atmosphere in the East Indies probably tended to the production of this alkaloid.

THE PATENT MEDICINE LICENCE.

Mr. BRETON said he had been induced by several members of the Society to bring forward the subject of the patent medicine licence, and he therefore desired to give notice that, with the permission of the President, it was his intention to introduce this subject at the next general meeting in May, with the view of devising some plan for the total abolition of the licence. He hoped he should then be able to lay before them some scheme by way of substitute; and he begged all those who possessed influence either for or against the proposal to attend that meeting. It was not his intention that evening to dwell upon the subject, but merely to state, which he was able to do on good authority, that if they as a body were unanimous, the removal of this objectionable impost would be speedily and satisfactorily accomplished.

The PRESIDENT remarked that the question of patent medicines was under consideration in one or two quarters of the Government. He had once heard it proposed to double the stamp. There were many difficulties in the laws relating to this subject which the authorities would be very glad to have cleared up. They would like to consolidate the whole into one Act, so as to have a clear description of what a patent medicine was, and the duty to which it was liable. He believed the revenue from stamps and licences was about £90,000 a year.

Mr. MACKAY said that in Edinburgh they had one or two meetings upon this subject, and had discussed it very fully. The experience they had had was that the question was surrounded with very great difficulty. He had given the President of this Society some indication by letter, that it was a most desirable thing that the Council should move in the matter, with the view of not only getting an equalization of the patent medicine licence, but, if possible, of getting it reduced to the minimum sum of 5*s*. He was not at all displeased that the matter had now taken a somewhat official form, and he hoped it would be carried forward by the Society. It was a most anomalous thing that the same licence should be two guineas in some places and in others 10*s*. and 5*s*. He did not think they could look forward at present to its entire removal; at the same time nothing was obtained without an effort. If there was a strong impression on the subject at the meeting in May, the friends in Edinburgh would be glad to lend a helping hand, and do what they could to get some remission or equalization of the licence.

The PRESIDENT said he had seen the authorities at Somerset House, and the proposal he made to them was to equalize the licence. He thought it might be fixed at one uniform sum of 10*s*., and in this case the revenue would probably not suffer from the change.

Mr. HASELDEN thought they lost sight of one point, and that was that if they reduced the price of the licence or abolished it they would open the door to the sale of patent medicines by all sorts of persons. At the present time when patent medicines were growing beyond control, he should like to see not only the licence but the duty increased. If it were reduced, they would open the door to their sale by stationers, hatters, greengrocers, and others, and already co-operative societies were selling medicines without paying duty.

ON THE INTRODUCTION OF METRICAL WEIGHTS AND MEASURES FOR USE IN PHARMACY.

BY DR. REDWOOD.

In proposing to submit the subject of weights and measures for discussion this evening, my principal object has been to draw forth the expression of opinion as to the desirability of taking some steps to promote the introduction of the metrical system for use in pharmacy.

The subject has come under the consideration of the Pharmaceutical Society or its members on several previous occasions, and although some difference of opinion has been manifested on those occasions with reference to the practical expediency of attempting a sudden or speedy change from the system at present used in this country to the metrical system, yet the superiority, in many respects, of the latter, and the probability, amounting almost to certainty, that sooner or later it will supersede all other systems, have been generally admitted.

The object of establishing one system of weights and measures for all nations commends itself so forcibly to the approval of those who are engaged in scientific or commercial pursuits, that the abstract proposition that it is desirable to accomplish such an object meets with ready assent, and any differences of opinion that may arise in connection with it almost exclusively relate to the comparative merits of different systems proposed for adoption, or to the balance between the anticipated gain from the adoption of that which is considered the best system and the loss or inconvenience which must inevitably attend a change while it is being made, or to the means by which, in the event of a change being decided upon, it may be most advantageously effected.

At the present time it seems hardly necessary to consider the question of the comparative merits of competing systems. The greater part of those who have studied the subject and are capable of appreciating the relative merits of the system in use in this country and of the French system, have decided in favour of the latter; but with the general public the question is not one of comparative merits but of comparative acquaintance or familiarity with these or other means for estimating the measurement of quantities, and as they have daily occasion for the application of such means, they are satisfied to use those with which they are most familiar.

As far as the general public is concerned, I have no doubt the prevailing feeling would be in favour of leaving things as they are, or of mending but not revolutionizing our system; yet there is undoubtedly a growing tendency to aim at a nearer approach to perfection than is attainable by any mere patching of that which is already but a clumsy piece of patchwork.

I believe the practical requirements of pharmacy present stronger grounds for a thorough reform of our system of weights and measures than can be adduced with relation to any other application of it, and the subject is one, therefore, which has strong claims upon our attention.

The acknowledgment in the Pharmacopœia, "that the absence in the present system of any denomination of weight between the grain and the avoirdupois

ounce of 437·5 grains, and the fact that the ounce is not a simple multiple of the grain, are grave defects," is sufficient to establish the necessity for further change, and the only question is, as to the nature of the change to be made. Shall we try again to patch up our own system, or shall we adopt an entirely new one?

The only new system that we can hope, or indeed could desire to have substituted for the one with which so much dissatisfaction has been expressed, is the metrical system, which has already received the sanction and approval of scientific and commercial men in almost every part of the civilized world.

In deciding to change our system for the metrical system, however, we do not necessarily imply that we are wholly dissatisfied with the one or entirely approve of the other. It is a great mistake, not unfrequently committed, to endeavour to discredit our system, in the hope of bringing about a speedy change to another, by ascribing to it defects that do not belong to it, and at the same time to extol the advantages of the metrical system by claiming for it more than it is entitled to.

It is sometimes represented that our weights and measures are not accurately defined, that they are liable to variation, and therefore cannot be relied upon, that in fact their construction is not based upon scientific principles, and that they are indefinite and uncertain.

On the other hand, the metrical system is sometimes represented as having a scientific basis, which gives to it in all its details a greater degree of certainty and accuracy than can be claimed for our system.

Now these are entirely erroneous notions, and it is important that no arguments in favour of the metrical system should be founded upon such false assumptions. Originally, it is true, there were no well-defined standards to which our weights and measures could be referred for verification, and no scientific means by which they could be reproduced in the event of all existing measures being destroyed. When a troy grain had no better definition than the weight of a grain of wheat, when the inch was defined as having the length of three barleycorns, the foot the length of a man's foot, and the yard that of the king's arm, there was indeed uncertainty enough in these measures. And even when, in course of time, the natural standards originally referred to were superseded and more reliable ones adopted, much still remained requiring further improvement.

In the latter part of the last century, the reformers of the great French Revolution, in reforming the then existing systems of weights and measures, adopted three fundamental propositions on which to base their new system.

1. That some natural object or phenomenon, presenting an unvarying measure of extension, should be taken as the unit from which all their measures should be calculated.

2. That measures of extension, of capacity, and of weight, should bear a definite and simple relationship to each other and to the fundamental unit.

3. That the different denominations of weight and measure should be multiples and submultiples of each other by ten; in fact, that the system should be throughout a decimal system.

In seeking for a natural standard to be used as the unit of measure, they took the metre, not, as it would appear, because it was found or considered to be the most suitable measure that could be fixed upon, but because it was the ten-millionth part of a quadrant of the earth's meridian. As it has since turned out, no advantage resulted from taking this particular measurement as the initial standard or unit, and in fact the first proposition might have been omitted without any practical disadvantage.

In this country we have pursued a somewhat similar course to that adopted by the French reformers, in reforming our system and framing that which has

been established here by law, but we have not acted entirely upon the same principles.

We proposed to take an object representing an unvarying measure of extension, which, depending upon a fixed law of nature, could be reproduced at any time and applied for the verification of our standards. But instead of taking the measurement of the earth's circumference, we took the length of a pendulum vibrating seconds of mean time, in the latitude of London, in a vacuum at the level of the sea. This measure scarcely differs from the French metre, but instead of using this measure as our unit, we used it only for indicating the proper length of the inch, from which all other measures of extension, capacity, and weight, according to our system, are calculated.

We have not established the same simple relationship between measures of extension, capacity, and weight, as exist in the French system, but have mostly retained such measures as were previously in use; and as the old measures were not framed in accordance with a decimal division, such a division does not characterize our system.

The essential differences between our system and the metrical system are these, that there is great incongruity between the different parts of our system, which is not the case with the metrical, and that the metrical system is a decimal one, which ours is not.

It may be stated of both systems, and equally of both, that the means originally proposed and provided for verifying the standard by reference to natural objects or phenomena have not proved to be practically available. Both systems in this respect have, to a certain extent, given way under the rigid application of the test of experience, and it is found that the most accurate method of verifying all weights and measures is by comparison with artificial standards carefully kept for that purpose.

Any superiority which the metrical system may possess over ours must be referred, not to the method of determining the fundamental unit from a natural standard, but to the more perfectly systematic manner in which all measures are related to the first integer in this system, to the decimal arrangement in it of all measures, and above all to the fact that it presents the only apparent means by which we can reasonably hope to establish one uniform system of weights and measures for all countries.

The advantages which in these respects the metrical system presents would probably ensure a ready assent to its adoption, if those required to use it could be induced so far to master the details of the subject as to acquire definite ideas of the quantities represented by the integral measures. It is with reference to this part of the subject that I wish particularly to invite discussion.

If we are to look to the metrical system as that which is ultimately to replace our present system, we must prepare the way for its adoption by making those who are engaged in the practice of pharmacy acquainted with it, and not merely acquainted with the system, which involves very little difficulty, but, what is of far more importance, acquainted with the values of the integral measures, so as to have some definite ideas of what they represent.

Until this has been done I cannot conceive that it would be practicable, and certainly it would not be compatible with a due regard for the interests of the public, to introduce so great a change as would be involved in the adoption of metrical weights and measures in preparing, prescribing, and dispensing medicines. The difficulty, and I think almost the only difficulty experienced by those who have been unaccustomed to the use of metrical weights in adopting them for any special purpose, is caused by the absence of clear conceptions of the quantities represented by the different integers. What is wanted in the first instance is that we should be able to associate some familiar objects with the several units of metrical weights and measures. I should like to hear the

opinions of practical pharmaceutists as to the practicability and desirability of introducing forms of medicine representing the more important metrical units, or some even multiples of them. Thus, for instance, most of the lozenges ordered in the Pharmacopœia weigh about 15 grains. Might they not all be made to weigh exactly a *gram*, and be marked with this weight? In fact the same rule, modified perhaps in some cases so as to make the weight 2 grams, might be applied to medicinal lozenges generally, by which means the public would become familiarized with the quantities represented by the weights which would be marked on each lozenge. If in this way we could establish forms of medicine representing different metrical units, we should be doing much towards preparing ourselves and the public for the reception of the new system, to which we should all become more reconciled as we became acquainted with the values of the terms used.

Our greatest difficulty would probably be with reference to measures of capacity. In France liquids as well as solids are weighed, and the measure-glass is rarely if ever used; but I believe it would be very difficult to establish that practice among our pharmacists, and there is no measure of capacity in the metrical system that accords well with the fluid drachm or ounce. There is room for the exercise of ingenuity and judgment in devising the most suitable means of meeting the requirements of the physician and pharmacist in adjusting quantities by measure in prescribing and dispensing.

If the metrical system were adopted by us in pharmacy, it would have to be adopted, of course, by the physician as well as the pharmaceutist; and those who advocate its introduction must be prepared to show how, for instance, the physician is to indicate the quantities of the several ingredients in a six or eight ounce mixture containing drachms of some ingredients, such as tinctures, and ounces of others, such as infusions. At present we have no better method of representing the metrical equivalent for the fluid ounce than by 28 cubic centimetres, but the multiples and submultiples of this number would be inconvenient for use, as they would have to be used in prescribing and dispensing.

To meet this and similar cases, it may perhaps be worth a consideration whether it would not be desirable to do something similar to that which was attempted by the French in 1812, and again in 1827, that is, to approximate the old system to the new by establishing some intermediate links between them, taking care in doing this to maintain the integrity of the new system, but slightly bending the old so as to bring them into juxtaposition. If we were to do something of this sort we might construct a new measure both for capacity and weight, consisting of 4 grams, corresponding to 61·7 grains, and this might be called a *tetram*. In the same way we might construct a new representative for the ounce, consisting of 8 tetrams, or 32 grams, corresponding to 493·8 grains, and this might be called an *octram*. If it were thought advisable to go further we might have a representative of the pound, consisting of 16 octrams, or 128 tetrams, or 512 grams, corresponding to 7900 grains, and this might be called a *libram*. These three new measures of weight and capacity, for in each case the weight of distilled water would represent a measure of capacity, while they would correspond with metrical measures, would be sufficiently near approximations to the drachm, ounce, and pound of our system to render them convenient integers to replace those measures in making a change from one system to the other. I throw out the suggestion for the purpose of courting discussion.

I would also suggest that, in introducing the metrical system in this country, the names of the different integers should be written according to English rather than French orthography. This would, I think, tend to reconcile some persons to the system who are accustomed to look upon it as a foreign innovation, besides which it would simplify the spelling of the names.

Provision has been made in the Pharmacopœia for the use of metrical weights

and measures in volumetric testing, and if chemists and druggists would adopt that method of conducting those and other similar operations, the practice of doing so would soon render them familiar with the system.

It has been proposed that in the Pharmacopœia, in addition to the weights and measures now specified in the processes, the metrical equivalents should also be given, with the view of showing the relationship existing between the values of the terms used in the two systems. I am not prepared to say that this might not with advantage be done in some cases where integral quantities can be expressed, and simple relationship shown; but to do it in all cases would, I think, encumber the descriptions of the processes without producing an adequate amount of good. Indeed, I am not sure that such an array of figures as the carrying out of this suggestion would necessitate would not tend more to involve the subject in confusion than to supply any useful information.

Among the propositions that have been recently made in connection with this subject is one which, coming from so high an authority as the Master of the Mint, is entitled to special attention. Mr. Graham, as is well known, is a member of the Standards Royal Commission, and the proposition I allude to has been submitted to the commission in the following form:—

STANDARDS COMMISSION, 1869.

Paper delivered by the Master of the Mint, 6th March, 1869.

The use of troy weights appears to be now confined to the Mint and Bank of England, the bullion trade, and jewellers. I have to propose that troy weight should be abolished, and the metric system of weights established in its place.

It is in their relations with the bullion trade that the Mint and Bank are now required to employ troy weight. In neither establishment would the change to metric weights be attended with difficulty. In the Mint the metric system has been already employed on the occasion of a large issue of copper "cash" to Hongkong and China. Each of these small pieces weighed one gram; and accordingly 1000 cash, which were equal in value to a dollar, weighed a kilogram. The convenience of the system for packing the coin was most obvious, 50 kilograms, or 50 dollars' value, being placed in each box.

The large bullion dealers, who reside chiefly in London, are already familiar with metric weights, their foreign business being very considerable. Their account keeping would be rendered uniform and simplified by the change.

Jewellers are, generally speaking, well informed, and their usual customers, it may be presumed, are of the educated class. The relation of jewellers to the assaying of gold and silver has already made them familiar with computations of some difficulty. The transition to the metric weights would be comparatively easy to them. The cost of new weights would be small, probably not more than £1 in each business on an average.

It would be desirable further to require assays of the precious metals to be always expressed decimally, as is already done for the Bank of England. This is necessary from the present application of the grain and carat in stating assays. The decimal expression of composition divests the subject of all obscurity.

The advantages which would be immediately gained by this practical application of metric weights would be the effective introduction of the system to the general notice of the public. It would probably also ensure the teaching of the subject in books upon arithmetic, even of the most elementary character.

The introduction of metric weights into pharmacy would possibly follow after no great interval of time. The metric system was indeed very nearly being adopted a few years ago, on the occasion of the transition from troy to avoirdupois weight. The enlightened character of the medical profession, and its thorough organization under the Medical Representative Council and the Pharmaceutical Society, would enable such a change to be made at any time with ease and effect, whilst its influence in diffusing widely a knowledge of the new system would be invaluable.

It may be inferred from this communication that no general or very extensive change in relation to our weights and measures is likely to be recommended

for immediate adoption by the commission, for Mr. Graham is known to be favourable to the introduction of the metrical system at the earliest practicable time, and he would not have suggested so slight a measure of legislation if a more sweeping change had been in prospect. This proposition, however, serves to indicate the views that are entertained among eminent men who have carefully studied the subject as to the safest and best method of bringing about the change which is looked for as a probable result at no very distant period. It is very satisfactory to find the Pharmaceutical Society referred to in the way it is in this communication, and it ought to stimulate those connected with the Society to endeavour to justify the anticipations which have been formed of the probable results of their labours and influence in promoting a reform of our weights and measures.

I have brought the subject forward on this occasion for the purpose of raising a discussion upon it; and the suggestions I have thrown out may, I hope, serve to call forth the expression of opinion upon the points I have alluded to, and induce others to contribute in the same direction.

Mr. Haselden said they were very much indebted to Dr. Redwood for bringing this subject before them, because he was quite sure that some day or other they would be compelled to adopt metrical weights and measures in pharmacy. France had adopted this system since the 1st January, 1840; Belgium since 1836; Holland as far back as 1821; Greece in 1836; Spain in 1859; Portugal in 1863; and nearly all the other nations of the world had adopted them at intermediate dates. As far as the public were concerned, he did not think they cared a straw whether they had the metric or any other system, as they looked at quantity and not at the particular weight. With regard to pharmacists, they ought really to become acquainted with the system. One reason why they should do that was that as travelling became more general, they had continually at the West-end of London, and no doubt in other parts, prescriptions brought over from abroad, in which the weights used were those of the metric system. It was necessary that every assistant who did any dispensing should know the value of the weights of the metric system, so as to approximate them to our own. Another reason was, that the examiners intended for the future that the young gentlemen who intended to pass should be examined in the metric system. That was put down upon their papers some three or four years ago, but not always enforced. He believed that after the 1st of October it would be uniformly enforced. If it came to him, he should certainly enforce it. The sooner, therefore, students became acquainted with the system the better. Dr. Redwood had alluded to the plan of giving the metric weights equivalent to their own weights in the Pharmacopœia. He (Mr. Haselden) would very much rather that the young gentlemen did that work themselves. It would do them a great deal more good than if they saw it in print. There was nothing so likely to fix a thing upon a young man's mind as the finding of it out himself. He hoped the generality of them would see the necessity of becoming acquainted with this system. Whether it was better than their own or not he was not prepared to say. He should be glad if the young people would make up their minds to study the question, and become thoroughly acquainted with it, so that when the time came and it was forced upon them they would be able to adopt it.

Dr. Attfield quite concurred in all that had fallen from Dr. Redwood regarding the subject before them; in fact, he congratulated the friends and pioneers of the metric system on the adhesion of so able, and, he might say, practical, an advocate as his colleague Professor Redwood. For himself, he regarded the universal employment of this system as simply a question of time; and when that result ensued, as he was sure it would ensue, it would doubtless be because

of the inherent beauty and simplicity of the system, and its adaptability to the wants of all classes of mankind. The fact was that steam and electricity had made all of them far more cosmopolitan than were their grandfathers and great-grandfathers; and hence had arisen, he conceived, the natural demand for a system of rules, measures, and coins, which should be the complement and the corollary to the universal system of decimal numeration. He might perhaps be allowed to remind them of the value of that system, and in doing so he thought he could not put the matter into better words than he had already done in a short paper that he published some three or four years ago in the 'Pharmaceutical Journal.' "Whatever language a man speaks his method of numbering is decimal; his talk concerning number is decimal; his written or printed signs signifying number are decimal. With the figures 1, 2, 3, 4, 5, 6, 7, 8, 9, 0, he represents all possible variation in number, the position of a figure in reference to its companions alone determining its value, a figure on the left-hand of any other figure in an allocation of numeral symbols (for example, 1869) having ten times the value of that figure, while the figure on the right-hand of any other has a tenth of the value of that other. When the youngest apprentice is asked how many units there are in 1869, he smiles at the simplicity of the question, and says 1869. How many tens? 186, and 9 over. How many hundreds? 18, 69 over. How many thousands? 1, and 869 over. But if he is asked how many scruples there are in 1869 grains, how many drachms, how many ounces, —he must probably bring out his slate and pencil. And so with the pints or gallons in 1869 fluid ounces, or the feet and yards in 1869 inches, or the pence, shillings, and pounds in 1869 farthings; to say nothing of cross-questions, such as the value of 1869 articles at 9*s*. 6*d*. per dozen; and to say nothing of perplexity caused by the varying values of several individual weights or of measures of length, capacity, and surface in different parts of the country. What is desired, then, is that there should be an equally simple decimal relation among weights and measures and coins as already universally exists among numbers. This condition of things having already been accomplished in other countries, there is no good reason why it should not be accomplished in this." It was important to bear in mind what had been done by other countries. He thought that eight countries in Europe had adopted this system, and recently Prussia had given in her adhesion to the scheme. He had before him the report of the Committee on the Project of Law for the Regulation of Measures and Weights for the North German Confederation, and he should like to read just one sentence from that report, inasmuch as it had led to very important results. The Commissioners said,—"We confine ourselves at present to the expression of our conviction that the advantages of a strictly decimal system are so great as to render its adoption imperative upon us, even if we should be the first to do so, and no probability existed of any other State following the same course. But what is the actual state of things with respect to this question throughout the world? The metric system is at this day in full operation in France, Belgium, Holland, Italy, Spain, Portugal, and Greece, even in part of Germany (the Bavarian Rhine-Palatinate), while it is at least permissively introduced in England, Switzerland, and the United States with every prospect of being finally adopted in these countries. Thus, in fact, the question can no longer be *whether*, but only *when* the metric system shall be introduced among us? The reply is easy to give; it should be—immediately! That every day we in Germany continue to use the old, bad, and, above all, hundredfold diversified measures and weights, is a loss to the national wealth. The metric system once introduced, we should obtain not only all its advantages in the transaction of internal trade, but also facilities that can scarcely be overestimated in our foreign commerce with France, Italy, and other countries who have adopted the metric system." The result of all this agitation in Germany in favour of the adoption of the metric

system was that Prussia had given in entire adhesion to it, and had passed a law, that after the 1st of January, 1872—only three years hence—the metric system would be compulsory throughout the whole of Prussia. Within the last two or three years the question of introducing it into India had come before the proper authorities; and although the matter was not quite settled at present and nothing had yet been published concerning it, he might be allowed to say, without any breach of confidence, that the recommendation of the various authorities and commissioners engaged in the matter was that the metrical system should be introduced throughout the whole of the five Presidencies of India. Then, as regarded England he had only to refer them to the division which took place in the House of Commons in May last on the second reading of the Metrical Bill, when the numbers against the passing of the bill, which was for the introduction of the system, were 65, and in favour of it, 217. Now the bill was not passed, for two reasons. First, because there were other very important matters which needed to be ventilated and passed. The other reason was, that the important commission alluded to by Professor Redwood—the Standard Commission—should go into the whole question and report thereon to the Government, before the matter was brought forward again. So then they came to the point which Professor Redwood had so clearly brought before them, as to the extent to which this system affected them, and the means by which they could best bring it before pharmaceutists and the general public. On the whole, he concurred with what Professor Redwood had stated; but he thought with reference to the introduction of the metrical equivalent in the formulæ of the British Pharmacopœia, that that would be one of the best and most important ways of bringing this matter practically before chemists and druggists. He did not think it would greatly encumber the Pharmacopœia if given for every process, inasmuch as it would be quite unnecessary to give the exact equivalents. All that would be necessary would be to give the equivalents of nineteen things out of twenty in grammes and not in submultiples of the gramme. Now, he thought that if they had the metrical equivalents of the weights and measures in the Pharmacopœia introduced into every formula, without anything compulsory,—for he quite agreed with Professor Redwood that it would be undesirable to introduce compulsion in this matter, at all events for the present,—if they had these equivalents so introduced, and induced manufacturers to mark their weights and measures metrically, and if they recommended chemists and druggists to use metrical weights and measures and have them marked with the equivalents of the old system, in that way all who felt inclined to entertain the matter at all—and by that time there would be many inducements for them to entertain it—would be able to do so to the best advantage. With regard to the question of the difficulties attending the introduction of the metrical system, he did not think it was desirable to enter upon them now. He would merely say that it was a general principle, that whatever could be done with numbers could be done with weights, measures, and coins, which, after all, were but the concrete expressions of numbers.

Mr. ABRAHAM, of Liverpool, said it was interesting to observe that the pharmaceutical chemists of Germany were in advance of their Government upon this question, for it would be found that in the last German Pharmacopœia, which included Austria as well as Prussia in Germany, published last year, the decimal system of grammes was introduced, and all the formulæ were given in parts. It was a very great convenience when they had occasion to use the Pharmacopœia, that they need not care what was the integer, because the relative proportions being given, they had only to take their grains, grammes, or ounces, to obtain a correct result. However, the pharmaceutists in Germany had adopted the system for general purposes before the Government.

The PRESIDENT said that in the first British Pharmacopœia, if he mistook

not, the equivalents for the metrical system were given side by side in some of the early proof-sheets, but this was afterwards omitted. Dr. Redwood had spoken of differences of opinion in regard to this question. He (the President) remembered very well their meeting upstairs in that house when it was first proposed to change the weights of the Pharmacopœia, and there was a proposition to introduce those of the metric system. Instead of the proposed change meeting with applause, as it now did, there was strong opposition to it. They could not now, however, shut their eyes to the inevitable advantages which would result from the introduction of the system; and he thought this Society had a better opportunity than ever it had of introducing it. It was gratifying to find that they were spoken of in the way Dr. Graham had spoken of them. They did not want to introduce the metrical system arbitrarily. This was a most important discussion, and he hoped they would hear more upon it from some of their friends, and if they could not do so then, which was properly the last evening meeting of the session, they might have another meeting. He did not know whether he was taking too great a liberty,—he had not consulted his colleagues,—in proposing that they should have another meeting on the first Wednesday in May, to consider this question further.

Mr. CARTEIGHE thought that Prof. Redwood's object had not been attained by the discussion of that evening. They had only approved the general principles of the metrical system, but what Prof. Redwood wanted them to do was to point out some ready mode of familiarizing themselves with the different weights and measures of the metrical system. They had not heard one gentleman allude to that part of the subject, and therefore he thought it would be as well to adjourn the meeting and have a separate evening for the discussion of the subject. Prof. Redwood had also suggested some modification of the decimal system for the purpose of assimilating existing weights to it, and he (the speaker) should not like that to go out with the weight of his authority without his being able to give them some more cogent reasons for it than he had done in his paper. He understood the object to be to bend the old system to the new, but if they did it in the way proposed, they would lose the beauty of the decimal system. He would, therefore, move that the meeting be adjourned, and that no other subject be taken up before this on the same evening.

The discussion was then adjourned to the 5th of May.

Mr. EVANS, Vice-President, brought before the Society a pipe for the inhalation of vapours, by Mr. James Bird, of Seymour Street. It was like an ordinary pipe, with an aperture in the centre, and a little stopper, which was saturated with the substance to be inhaled, and by applying it in the ordinary way they got an admixture of atmospheric air. He then read a letter which he had received from Mr. Bird.

The PRESIDENT having announced that the *conversazione* would be held on Tuesday, the 18th May, and intimated that objects of art and curiosity would be gladly received as loans, the meeting adjourned.

THE SANDFORD TESTIMONIAL.

Subscriptions received since the publication of the last list:—

	£	s.	d.
Allen, W., Dumfries	0	5	0
Allen, J., Plymouth	0	5	0
Barber, George, Liverpool	0	10	6
Beach, James, Bridport	0	10	6
Blake, Charles T., 47, Piccadilly	1	1	0
Bullock and Reynolds, Hanover Street	1	1	0
Burrow, W. and J., Great Malvern	1	1	0
Butt, E. N., Cheshunt	0	10	0
Clapp, E. F., Stoke Newington, N.	0	5	0
Clark, John, Liverpool	0	10	0
Crispe, James, 4, Cheapside	1	1	0
Crotch, James, 31, Edgeware	1	1	0
Davies, Joseph, Hay	0	2	6
Davis, J. M., High Street, Shoreditch	0	10	0

	£	s.	d.
Dowse, Dr. S., Charing Cross Hospital	1	1	0
Evans, John, Carnarvon	0	10	6
Farmer, John, Putney	0	5	0
Fergusson, John, Liverpool	0	10	6
Foster and Else, Brighton	1	1	0
Gale and Co., Bouverie Street	2	2	0
Gunn, S. J., Harrow-on-the-Hill	0	5	0
Haynes, Chas. H., 110, Talbot Rd., W.	0	5	0
Howarth, James, Doncaster	0	5	0
Hughes, Edward, Altrincham	0	5	0
Hughes, John, Altrincham	0	5	0
Hunt, Thomas, Liverpool	0	10	6
Jackson, John, Southampton Row	1	1	0
Jessop, John, Halifax	0	5	0
Jones, G. W., Worksop	0	5	0
Lord, Charles, Todmorden	0	10	0
Marsden and Sons, 36, Queen St., E.C.	1	1	0
Mather, W., London and Manchester	1	1	0
Robinson, James, Norwich	0	10	6
Romans, Thomas W., Wakefield	0	5	0
Rowntree, Thomas, Wakefield	0	5	0
Stevenson, R., Derby	0	5	0
Thomas, H., St. Leonard's-on-Sea	0	10	6
Trotman, A.W., Cambridge St., Hyde Pk.	0	5	0
Wilkes, D. S., Upton-on-Severn	0	2	6
Yarde, Giles, Lamb's Conduit Street	1	1	0
Young, Thomas, Millwall, E.	0	5	0

Gentlemen who have not yet paid their subscriptions are requested to forward the amount immediately to the Treasurer, B. B. Orridge, Esq., 32, Ironmonger Lane, E.C., or to Mr. Elias Bremridge, 17, Bloomsbury Square, W.C.

At a meeting of the Committee on Monday, the 19th of April, it was announced that the total amount subscribed is £503. 13*s.* 6*d.* A Sub-committee was appointed to make the necessary arrangements with an eminent Royal Academician for the painting of the portrait.

It was also resolved that plate of the value of 200 guineas be purchased and presented to Mr. Sandford, in the Lecture Theatre of the Pharmaceutical Society, on Wednesday, the 19th of May next, at 3 P.M., after the Society's Annual Meeting.

A dinner will be provided, to celebrate the occasion, at 6 P.M. on the *same* day, at the Freemasons' Tavern, Great Queen Street, Lincoln's Inn Fields. The chair will be taken by Mr. Frederick Barron, Chairman of the General Committee. Tickets, 21*s.* each, may be obtained of Mr. Henry Matthews, Hon. Sec., 60, Gower Street, W.C.; or of Mr. Bremridge, 17, Bloomsbury Square, W.C., by application *before* the 17th of May.

Subscribers to the Fund, and all interested in Pharmacy, are invited to attend.

TESTIMONIAL TO MR. JOHN MACKAY.

At a meeting of a few members of the North British Branch of the Pharmaceutical Society recently held in Edinburgh, it was suggested by Mr. H. C. Baildon that the time had arrived when it was desirable to present Mr. John Mackay with a fitting testimonial for his long and arduous services, gratuitously rendered to the Society for twenty-eight years as Honorary Secretary for Scotland. The following members of the Council were present, viz. Mr. W. Aitken, Mr. H. C. Baildon, Mr. G. Blanshard, Mr. D. R. Brown, Mr. D. Kemp, and Mr. J. R. Young, who expressed their cordial concurrence in the proposal. Mr. H. C. Baildon was requested to act as Honorary Treasurer, and Mr. W. Ainslie as Honorary Secretary. The sums below have already been subscribed:—

Amount previously advertised £115 0 0

	£	s.	d.
Beatson and Co., Rotherham	1	1	0
Black, John, Glasgow	0	5	0
Brown, Brothers, Glasgow	0	10	6
Brown, Thomas, Edinburgh	1	1	0
Brown, W., Dunfermline	1	1	0
Cameron, J., Edinburgh	0	10	6
Davenport, J. T., London	1	1	0
Duncanson, W., Stirling	1	0	0
Frazer and Green, Glasgow	1	1	0
Gilmour, A., Burntisland	0	10	6
Greig, William, Glasgow	1	1	0
Guthrie, P., Glasgow	0	5	0
Harrower, P., Glasgow	0	10	6
Iverach, J. G., Kirkwall	0	10	6
Iverach, W., Wideford	0	10	6
Jaap, John, Glasgow	0	10	6
Kennedy, W., Glasgow	0	5	0
Kinninmont, A., Glasgow	1	1	0
Laidlaw, W., Edinburgh	0	10	6
Lawrence, John, Glasgow	0	10	6
Loftus, C. C., Glasgow	0	5	0
Maclagan, Professor D., Edinburgh	1	1	0
M'Millan, J., Glasgow	0	10	6
Meggeson and Co., London	2	2	0
Meggeson, Mr., London	1	0	0
Moffatt, Thomas D., Glasgow	1	1	0
Nesbitt, J., Portobello	1	1	0
Nicol, John, Glasgow	0	5	0
Peters, J. F., Jedburgh	1	0	0
Rait, R. C., Glasgow	0	10	6
Reid, N., Perth	0	10	6
Robertson, A. M., Glasgow	1	1	0
Russell, Mr., Dundee	1	1	0
Scott, Thomas, London	2	2	0

	£	s.	d.		£	s.	d.
Seth, A., Dunfermline	1	1	0	Veitch, J., Dunse	0	5	0
S. H. F., Glasgow	0	3	0	Walker, D. P., Glasgow	0	5	0
Sparrow, William F. C., London	1	1	0	Waugh, Mr., London	2	2	0
Standring, Thomas, London	1	1	0	White, W., Glasgow	0	10	6
Steel, Gavin, Dunfermline	1	1	0	Young, Dr. James, Edinburgh	1	1	0

The list will be closed on the 7th of May.

PROVINCIAL TRANSACTIONS.

HALIFAX AND DISTRICT CHEMISTS AND DRUGGISTS' ASSOCIATION.

A Meeting of the members of the above Association was held on Wednesday, the 14th inst., at the Mechanics' Institute. Mr. DYER, President, who occupied the chair, opened the evening's proceedings by informing the members that at the last Committee Meeting a deputation was appointed to wait upon the Mayor and Town Clerk to represent to them the injury done to the trade, by the operation of the Petroleum Act in reference to the sale of benzine. The representations of the deputation were so far successful as to obtain from those gentlemen an understanding that no interference with the sale of benzine would be attempted nor any licence be required, so long as that article was sold in the quantities and form as stated. Pending further instructions from London, of which the trade would be duly informed, the chairman believed that this annoyance would soon be righted; referring to the desire expressed at the last General Meeting for a uniform rate of charges for prescriptions dispensed, he was glad to be able to say that the Committee, after considerable deliberation, had agreed upon a list of charges, which he would call upon the Secretary to read to the members.

The HON. SECRETARY, with a few remarks on the necessity of a cordial co-operation in such a project, said the experience of each member would convince them of the good morally and pecuniarily which should attend its success, hoped it would receive the support it deserved from all; he then read to the members the whole of the plan, and afterwards each section, which was freely discussed and slightly altered to the entire satisfaction of all present, and was passed unanimously.

Mr. FARR then proposed, and Mr. BROOK seconded, "That the meetings of the Association in future be held at the Mechanics' Institute, and that the Secretary be empowered to make the best arrangements he can with the Directors to meet the requirements of the Association." The motion was carried.

Mr. JESSOP then proposed, and Mr. BEVERLEY seconded, "That the meeting be held monthly, business or no business, paper or no paper." The SECRETARY proposed as an amendment, "That there be no meetings in the months of June, July, and August, except matter of pressing import occurs." Mr. BROOK seconded this, which was carried by a small majority.

A general conversation on trade matters then ensued, and the meeting was closed by a vote of thanks to the chair.

LINCOLN CHEMISTS' ASSOCIATION.

The concluding Quarterly Meeting of the session (October to March) was held in the usual room in Silver Street on Tuesday evening, the 30th ult.

New officers, in place of retiring ones, were elected for the ensuing session, and the accounts passed, etc. Mr. C. Ekins was elected President in place of Mr. J. C. Kite; Messrs. T. E. Harrison, W. Higgatt (re-elected), and W. Hutton (re-elected) as councillors; Messrs. J. M. Parker and W. H. Woodcock were re-elected as Vice-President and Honorary Secretary and Treasurer respectively; the report also shows the Association to be in a prosperous condition. After the ordinary business of the evening was gone through, a unanimous vote of thanks was passed to Mr. J. S. Battle (an honorary member) for his gratuitous assistance in superintending the various manipulations in

chemistry. In conclusion, a vote of thanks was also recorded and recommended to be duly forwarded by the secretary to the respective Editors of the 'Pharmaceutical Journal' and the 'Chemist and Druggist,' for the donations of their valuable journals, after which the meeting terminated.

LIVERPOOL CHEMISTS' ASSOCIATION.

Eleventh General Meeting, held at the Royal Institution, March 18th, 1869; the President, Mr. J. F. Robinson, in the chair.

The Secretary announced the following donations to the Library:—'Historical Memoirs of the Philadelphia College of Pharmacy;' 'The Forty-fourth Annual Report of the Liverpool Institute.' Thanks were voted to the donors.

Mr. Abraham read a case submitted to the Privy Council, with reference to the labelling some of the preparations of opium, arsenic, etc. "poison," with special reference to paregoric. He also read the reply of the Privy Council. In making some remarks on this subject, Mr. Abraham said that he thought the question was still left open, and that if a chemist did not label paregoric "poison," he would do so at his own risk. The Privy Council, having no power to alter the law, could only give an expression of opinion which might guide, but would not bind those who had to carry out the law.

Mr. Sumner said that the difficulties were inevitable if a poison schedule were to exist at all, which he thought unnecessary. The answer of the Privy Council was like the answer which the Excise authorities gave to queries addressed to them, avoiding any positive decision.

Mr. Abraham then exhibited a new form of capsule, softer, and more flexible than those now in use.

The President then called upon Dr. Charles Symes to read a paper on "Cotton Seeds and their Products."

The author described the two varieties of cotton seeds found in the market, and the processes by which they were treated. The black smooth seeds are easily worked, and command a high price; but until quite recently the seeds covered with short cotton, known as "hairy seeds," have been comparatively valueless, all attempts to work them to any real advantage proving futile. By processes patented last year by Messrs. Rose and Gibson of this town, these difficulties are surmounted. An arrangement of machinery, worked by a single engine, separates stones, dirt, etc., breaks the seeds, and separates the kernel in a state of meal. The oil is obtained from this by hydraulic pressure of a dark red colour, which colour all bleaching agents fail to remove, but it is dissolved out by alkaline treatment, leaving the oil in taste, smell, and appearance nearly equal to olive. The cake, from containing a mere trace of husk, and being free from chemical treatment, is more valuable, though obtained from the black seeds which contain all the husk. The following analysis of the two will show this fact most clearly:—

	Cake from Hairy Seeds.	Cake from Black Seeds.
Albumen	35·7	25·4
Mucilage and Sugar	17·0	8·7
Starch	18·3	10·6
Oil	8·0	8·5
Ash	8·2	6·5
Woody Fibre	2·3	28·0
Water	7·0	8·2
Loss	3·5	4·1
	100·0	100·0

The combination of colouring matter and alkali with a certain portion of soap ("Foots") is thus converted into a good soap of a dark colour; or, treated with sulphuric acid, and submitted to destructive distillation, the products being stearine, a soft fat, and dark red spirit of an exceedingly disagreeable odour, and for which, at present, no use has been found.

By an ingenious mechanical arrangement the husk is separated from the cotton which covers it, the former being used as a manure, the latter making excellent paper.

Mr. Symes stated that a large number of experiments had been made during the whole of last year, and great obstacles overcome before the manufactures were brought to their present state of perfection.

Specimens were exhibited of the various products described.

The PRESIDENT said that in this country the oil was principally used for soap-making, and was also used by the Jews for cooking purposes, being equal to olive for that purpose.

Mr. BIRD said the Arabs preferred cotton-seed oil to all others for cooking.

A vote of thanks was unanimously passed to Dr. Symes, after which the meeting closed.

THE MANCHESTER CHEMISTS AND DRUGGISTS' ASSOCIATION.

A Special Meeting was held at Union Chambers, Dickenson Street, on Friday, March 19th; Mr. W. S. BROWN, Vice-President, in the chair.

The CHAIRMAN, in opening the proceedings, said that the subject of prices had occupied the attention of the Council for some time, and that, after considerable discussion, it has been decided that, for the present, it was not desirable to endeavour to form a complete price list. The circumstances of various localities, and the demand, differed so widely, that it would be difficult to fix a uniform rate of charge. It was, however, felt that dispensing charges might be made more uniform, and that, with every prospect of success, a list might be framed and offered to the trade for adoption. To carry out this, the Council appointed a sub-committee, who, after several meetings and much consideration, agreed on and submitted a list to the Council. It was then considered the proper course to submit it to members of the Association generally, and to prevent any interference with the paper promised by Mr. Slugg for the next meeting, and to afford an opportunity for fuller discussion, this special meeting had been called. The Chairman said the prices in the list were, for the most part, not higher than had been customary in leading dispensing establishments in Manchester, and would be readily obtained. For small quantities of medicines the charge hitherto made had been most inadequate. Justice demanded that the chemist, in his improved legal position, and with the resulting increased demand for superior acquirements, should be adequately remunerated. It was not intended that members of the trade who agreed to the new list of prices should be absolutely bound by it; the utmost liberty of action was desired, the obligation being simply one of honour. At the same time, the importance of the movement, and the pains taken by the committee, induced the hope that, if the list be adopted, it would be observed as strictly as possible. After explaining the advantage and importance of using a universal price-mark, which, being marked on the prescription by the first dispenser, became a guide to all subsequent ones, the Chairman proceeded to read the list, and to more fully explain the reasons which led to deviations from the old prices, where such proposed changes appeared; urging unanimity of feeling, and inviting the fullest and most open discussion, he submitted the list for adoption.

Many members then spoke on the subject. Amongst others,—

Mr. L. SIEBOLD said he did not approve of making any lower charge for dispensing than one shilling; one, two, or three pills should be worth that. He also did not see why pills prescribed with a mixture should be charged less than when prescribed alone. The trouble and care and responsibility connected with the dispensing of a prescription were certainly worth that trifling amount. He very much regretted that prices which had been obtained for thirty-five years should form a basis for the charges now to be adopted. Drugs commanded a higher price, the cost of living had increased very considerably, and, above all, a large number of very expensive chemicals were now used in dispensing, whilst the prescriptions of former times generally contained substances of comparatively trifling value. He thought the price-list just read did not correspond with the views so ably advocated in Mr. Hampson's paper. Assistants were now compelled to pass an examination,—most of them would probably pass it before long; and when they came to calculate the heavy expenses incurred for lectures, books, examination fees, etc., and

when they began to feel their superiority acquired by scientific training, they would then, as a matter of course, demand a very considerable increase in their salaries; and, in order to pay higher salaries, chemists must charge higher prices. They had therefore to choose now between adopting at once a scale of reasonable and remunerative charges, or doing so after a year or two at the dictation of the assistants.

Mr. HAMPSON, in reply to a previous speaker, who, before adopting the list, urged the desirability of a complete canvass being made of the chemists of surrounding towns, expressed the opinion that so large an undertaking was impracticable, and did not come within the scope of the Association. He recommended chemists in those towns to meet together to discuss and, if possible, to agree to the list. He strongly solicited the unanimous adoption of the list, as a precedent and a basis for a more perfect scheme which experience would doubtless render necessary.

Finally, the list was unanimously adopted.

Mr. ROBINSON (Pendleton) then proposed, and Mr. BODEN (Patricroft) seconded, "That members of the Association endeavour, in their respective districts, to secure the co-operation of members of the trade in making charges according to the scale." Carried unanimously.

A vote of thanks to the Chairman terminated the proceedings.

NOTTINGHAM AND NOTTINGHAMSHIRE CHEMISTS' ASSOCIATION.

The usual Monthly Meeting was held on Friday evening, April 9th, at the Exchange Rooms; Mr. ATHERTON in the chair.

There was a very large meeting, H. SUGDEN EVANS, Esq., Vice-President of the Pharmaceutical Society, having consented to deliver an address to the Society on Pharmaceutical Education.

The minutes of the last meeting were read and confirmed.

The PRESIDENT had great pleasure in calling the attention of the meeting to the cabinet of materia medica on the table, which he believed contained nearly every pharmaceutical and chemical preparation and drug in the British Pharmacopœia, admirably arranged and classified, and intended to assist the student of pharmacy in preparing for examination.

They were indebted in a very great measure to their visitor, Mr. Evans, for that very useful gift, and it only added more to the obligation they owed to him for his presence amongst them that evening.

He had very much pleasure in presenting to the Society the cabinet at the request and on behalf of Messrs. Evans, Sons, and Co., Liverpool, and Messrs. Evans, Lescher, and Evans, London.

A cordial vote of thanks was passed unanimously to Messrs. Evans and Co. for their valuable present.

The PRESIDENT, in introducing Mr. H. Sugden Evans, briefly alluded to the importance of pharmaceutical education, and the magical effect produced on the slumbering energies of the body of chemists by the passing of the Pharmacy Act. This importance was felt in Nottingham, and had resulted in the formation of the Nottingham Chemists' Association. Pharmaceutical education was their aim, and he congratulated the Society that so powerful and influential an advocate had honoured them by coming to address them on the subject.

Mr. EVANS then delivered an admirable address, which want of space compels us to omit.

The PRESIDENT expressed his gratification at listening to the able remarks of Mr. Evans, who had done them great service, not only by enunciating his sound opinions on pharmaceutical education and the excellent advice he had given them, but by encouraging them in their good work, and increasing their energy from the position he held as Vice-President of the Pharmaceutical Society. The subject recalled to his mind the important matter introduced by Mr. Reynolds, of Leeds, in the Pharmaceutical Journal of last month, namely, the recognized and substantial support of the Society to local educational institutions. He had long held the opinion that the parent Society might very much further education and emulation in the provinces by such

means, and now that the Society's income was so much increased, and the benevolent fund having reached the required sum, he hoped that the Council of the Society would help such societies as theirs. The income of such societies was quite out of proportion to the work they had to do. After alluding to local examinations, the speaker invited any member of the medical profession present to express their views on the subject of the lecture.

Mr. BEDDARD, M.B., said that as a member of the medical profession, he had listened with great pleasure to the excellent advice given by the lecturer to all those preparing for the examinations, as to thoroughly mastering one step in their studies before attacking another. Their progress might not appear so rapid as that of the superficial student, but it would be real. With regard to the results of pharmaceutical education, it was an immense comfort to a medical man to know that his prescription passed through the hands of a man who would not only faithfully dispense his correct prescriptions, but would detect those slips of the pen to which the most careful prescriber is liable at times. He finished by assuring the society of his cordial support in furthering its objects.

Mr. MAYFIELD proposed and Mr. WHITE seconded that the best thanks of this society be given to Mr. Evans for his able address, and that he be elected an honorary member of this society. This was carried unanimously.

Mr. EVANS returned thanks, and said it afforded him great pleasure to be present that evening, and he hoped at some future time to have the pleasure of again addressing them.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL ASSOCIATION.

The ordinary Monthly Meeting was held in the rooms of the Society, Music Hall, on Wednesday evening, April 14th, the President, Mr. J. Hill, in the chair, when a paper, on "The Adulteration of Food or Drink Act, as extended to all Articles taken or sold as Medicines, stated in clauses 15 and 24 of the Pharmacy Act, 1868," was read by Mr. G. B. COCKING, the subject being treated of under the following heads:—

1. The extent to which the adulteration of drugs and the preparation of medical compounds otherwise than in accordance with the formulas of the Ph. B., were carried on, resulting in reduction of price and unfair competition by unregistered shopkeepers.

2. How may this be abated? By enforcing clauses 15 and 24 of the Pharmacy Act, 1868.

3. By whom enforced?

A. In the case of medicated spirits, tinctures, etc., by the officers of Excise, whose duty it is to prevent any loss of revenue arising from such adulterations.

B. By any private individual who will take the trouble of acting in accordance with clause 4 of the Food Adulteration Act.

C. By the Pharmaceutical Society, appointing Inspectors, unknown in the localities to which they may be sent.

4. Ignorance no plea against conviction and penalties in the case of Registered Chemists and Druggists; clause 24, Pharmacy Act, presuming that all such persons are qualified "to have knowledge of such adulterations."

Mr. COCKING concluded his paper with the following remarks:—"If the regulations referred to in the two Acts are enforced, the trade generally will be greatly benefited; the unfair competition with the host of little shopkeepers and co-operative stores will be ended; a few public prosecutions will soon effect this *desideratum;* and then, when pure genuine drugs are sold only by Registered Chemists and Druggists, it may be anticipated that an agreement may be effected as to greater uniformity in the retail price of both simples and compounds, and be speedily followed by a similar uniformity in the prices charged for dispensing prescriptions."

Mr. RADLEY, in moving a vote of thanks to Mr. Cocking for his very interesting paper, remarked that the subject of the "Food Adulteration Act" in connection with the "New Pharmacy Act," did not appear, hitherto, to have been brought very prominently before the trade; the paper had presented points of great importance, making it evident, when the two Acts were fully enforced, advantages would be secured and evils remedied, which were greatly desired by all. Mr. WILSON seconded the proposition.

The thanks of the Meeting were also accorded to several wholesale houses and others, for seasonable contributions and promises of assistance in the formation of the Museum and Library.

The first course of lectures on Inorganic Chemistry, by Mr. G. Harrison, being nearly completed, a course on Materia Medica, by Mr. G. R. Gowland, was announced. The introductory lecture to be given before the Society on the 12th of May. A Botany Class is also in course of formation. A number of new Members, Honorary Members, and Associates having been proposed, the meeting separated.

SUNDERLAND CHEMISTS' ASSOCIATION.

The Second Meeting of the above society was held on Wednesday evening, 14th April, when W. Thompson, Esq. (Mayor), was unanimously elected President, and a sub-committee consisting of Messrs. Dobinson, Sharpe, Harrison, Dalby, and Bird, were appointed, to assist in carrying out the objects of the society.

It was resolved that, by the next meeting the committee should be prepared with a code of rules for governing the society, and endeavour, at as early a period as possible, to arrange a list of prices, for dispensing and retail, that will meet the views of all the members.

ORIGINAL AND EXTRACTED ARTICLES.

ON AFRICAN TRAGACANTH.

BY DR. F. A. FLÜCKIGER, OF BERN.

The substance to which I here apply the name of African Tragacanth is an exudation from the trunk of *Sterculia Tragacantha* Lindl., a tree of moderate size occurring in Tropical Western Africa from Senegambia to Congo. Mucilaginous matter is known to characterize several plants of the order *Sterculiaceæ*, in which respect one of the most noteworthy is *Sterculia urens* Roxb., an East Indian tree which exudes abundantly a substance resembling tragacanth. The exudation of the African species under notice has also long been known; but as its chemical nature has not hitherto been investigated, I think the following observations may be of interest. The specimen examined is authentic, having been collected with the plant by the late Mr. Barter, and transmitted to the Royal Gardens of Kew.

African Tragacanth, as I have received it, consists of irregular, knobby, undulated, droppy, or stalactitic masses, more or less bubbly or cavernous, often exceeding an ounce in weight, of a pale yellowish hue or almost colourless, in small fragments nearly transparent, but seen in mass somewhat opaque by reason of innumerable cracks, which also render it much more brittle than true tragacanth. Each mass is in fact traversed by curved fissures answering to successive protrusions of gum. Fragments of bark are often adherent to the flat or inner side of the pieces.

With 20 parts of water, coarsely powdered African tragacanth forms, like common tragacanth, a thick tasteless jelly; with 40 parts of water, the jelly becomes more fluid. Only a very small quantity of gum is really dissolved in the water; the filtered liquid is not precipitated either by neutral acetate of lead or by absolute alcohol, but on addition of basic acetate of lead it becomes a little turbid. The jelly itself reddens litmus paper. Neither thin slices of the dry tragacanth nor the jelly exhibit any trace of cellular structure or of starch, even when examined in polarized light by means of the microscope. In this respect the tragacanth of *Sterculia* differs from that of *Astragalus*. As a means of promoting

the adhesiveness of pilular masses I find the former, whether in the form of powder or mucilage, as advantageous as ordinary tragacanth.

The fine powder on exposure for some days to a temperature of 212° F. loses 20·50 per cent. of its weight. The formula $C_{12}H_{22}O_{11}+5H_2O$ would exactly require 20·5 per cent. of water. It is not soluble in an ammoniacal solution of peroxide of copper; repeatedly boiled with fuming nitric acid it affords an abundance of mucic acid.

The weight of the powder as obtained by drying it at 212° F. does not diminish at 230° F. (110° C.). Upon incineration, the dried powder leaves 7·8 per cent. of ash of which the prevailing constituent is carbonate of calcium; 0·122 gramme of the ash indeed contain (after having been previously moistened with a solution of carbonate of ammonium and again gently heated, in order to prevent any loss of carbonic acid) 0·0587 gramme carbonic acid. The amount of the basic part of the ash is accordingly 4·08, referring to 100 parts of the above powder.

The dried and powdered gum was now submitted to elementary analysis* by means of peroxide of copper and a current of oxygen.

			Carbonic Acid.	Water.
I.	In the first experiment	0·3412 gramme	yielded 0·5066	and 0·1648
II.	,, second ,,	0·2982 ,,	,, 0·4380	,, 0·1524

that is to say

I. 0·1374 of carbon and 0·01831 of hydrogen
II. 0·1195 ,, ,, 0·01693 ,, ,,

accordingly the percentage is in . .	I.	II.
Carbon	40·27	40·06
Hydrogen	5·37	5·91

These numbers however, referring to the crude tragacanth, must be calculated with regard to the fact, that 100 parts of the raw drug correspond to 95·92 parts only of pure tragacanth, if we deduct the above 4·08 per cent. of the bases contained in the ash.

Thus then the percentage-amounts are for . .	I.	II.
Carbon	41·98	41·76
Hydrogen	5·59	5·91

The formula of *gum arabic* shows the following numbers:

12 C . . .	144 . . .	42·12
22 H . . .	22 . . .	6·41
11 O . . .	176 . . .	51·47
	342	100·00

Common tragacanth and other similar gums however are usually referred to the formula

12 C . . .	144 . . .	44·44
20 H . . .	20 . . .	6·17
10 O . . .	160 . . .	49·39
	324	100·00

I restrict myself for the moment to the mere communication of the above facts

* Performed in my laboratory by Dr. Kraushaar.

and will not enter into the discussion, whether a gum, tragacanth or bassorin, exists or not, to which the formula $C_{13}H_{10}O_{10}$ should be assigned. Perhaps all the various kinds of these bodies may be referred to one and the same formula. The African tragacanth at least corresponds rather in this respect with gum arabic.

From the experiments here detailed I infer, that the African Sterculia-tragacanth may be used both in pharmacy and in the arts instead of the usual drug of Asia Minor. When the Niger and its tributaries are opened to trade, this gum may possibly form an important item of exportation.

A NEW BELLADONNA PLASTER.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—Your correspondent, Mr. Gissing, in the last number, asks for certain information relative to the extract of belladonna now in use for making the emplastrum belladonnæ of the British Pharmacopœia, which I am not able to give; but, as belladonna plaster has for some time occupied my attention, it may, perhaps, interest Mr. Gissing, or other of your readers, to know how much better a plaster can be produced by the use of resinous extract of belladonna *root* than that made with the spirituous extract of the leaf.

Instead of the dark, nasty preparation of the Pharmacopœia, I obtain a beautiful plaster, somewhat resembling empl. cerat. sapon., which adheres very nicely, requiring no adhesive margin, neither does it run nor exude, so that it may be worn a month or longer without staining the linen or producing any discomfort whatever.

When this plaster is made with a third of its weight of pure extract, it is remarkably soothing, and, judging by my own experience, I think it promotes quiet and refreshing sleep.

I am not aware that the extract of the root has ever been used in this way before, but I think it must commend itself to every pharmacist, as, besides being cleaner, the root is always more to be relied on for medicinal activity than any other part of the plant.

I am, gentlemen, yours respectfully,

JOHN BALMER.

205, *St. John Street Road, London, E.C., April* 20, 1869.

NOTE ON DISPENSING.

A recipe, the main ingredients of which were as follows, was directed to be prepared:—

℞ Potass. Chlorat. ʒss.
Sodæ Hypophosphit. ʒj.
Syrup. Simpl. ℥ss.
Aquæ *ad* ℥vj.

The salts, owing to pressure with regard to time, were mixed energetically together in a mortar. Explosion ensued with no other dangerous result than whirling the pestle to a distance, and slightly injuring the dispenser. The mode of compounding this and similar formulæ is to dissolve the salts separately, when no accident can happen.

NOTES AND ABSTRACTS IN CHEMISTRY AND PHARMACY.

BY C. H. WOOD, F.C.S.

The Action of Light on Citrate of Iron and Quinine.

I was engaged about two years ago in preparing some citrate of iron and quinine, and by scaling my product in a hot cupboard, I obtained good-sized scales,—bright, of a golden-green colour, and perfectly soluble in water. Remembering, however, that potassio-tartrate of iron gives far better scales when scaled in the sun's rays, than by any artificial heat (a fact I learnt from Mr. Braithwaite), I spread some of my solution on plates of glass, and exposed them in a window to an April sun. I was soon surprised, however, to observe the citrate becoming darker in colour and exhibiting a very good photographic image of some bottles which cast their shadows on the plates. After a time, but while still wet, it gradually became opaque, as if the quinine had been precipitated. It ultimately came off in minute brownish-coloured powdery scales. The two results from the same solution were as different as they possibly could be. The sun-scaled specimen when put into water became white and opaque, and only dissolved after the lapse of a long time. The scales produced by heat, when thrown on water, rapidly melted, retaining their perfect transparency to the last. The salt contained 17 per cent. of quina.

I then thought it would be worth while to ascertain whether the strong solution only is subject to this change, or whether the finished product would be also affected in like manner by exposure to light. About a drachm of the good citrate, scaled by heat and dissolving freely without opacity, was therefore spread out on a sheet of white paper and laid in the sun's rays. After a quarter of an hour's exposure, it was perceptibly deepened in colour. In twenty minutes it had become brownish, and when put into water became at once white and opaque. The white spongy bits floated about in the liquid, and gradually, but slowly dissolved. Some samples of citrate of iron and quinine were then obtained from several different makers, and exposed in the same manner. All were more or less similarly affected, but nevertheless the results varied considerably. In some cases the salt was even more decidedly affected than my own had been; but in others the result was less injurious, and when the scales, after insolation, were treated with water, although they became white and opaque, their ultimate solution took place rapidly. Portions of these exposed specimens were wrapped up and put away in a dark place for some time; upon subsequently examining them, they had to a great extent passed back to their original condition. It has often happened that samples of this salt have been disparaged on account of their difficult solubility; from these results, however, it would appear possible that this defect has not been so much due to any fault in the manufacture as to some accidental circumstance in the preservation of the product. Should time and opportunity offer, I hope on some future occasion to investigate more fully the nature of the change which thus occurs in citrate of iron and quinine by exposure to light.

The Solubility and Estimation of Quinine.

M. Fausto Sestini* has made some new determinations of the solubility of quina in pure water. He finds that one part of quina requires 1667 parts of water at 20° C., and 902 parts at 100° C. for its solution. One part of the hydrate of quina (with 3 H_2O) requires 1428 parts at 20°, and 773·4 at 100° C. The alkalies diminish the solubility of quina, and soda to a greater extent than potash; a ley containing one-sixth of soda dissolving none. The author has analysed several arseniates of quina, in which he estimated the alka-

* 'Bulletin de la Société Chimique,' Février 1869.

loid by the following method:—The salt is dissolved in water acidulated with sulphuric acid, and the quinine precipitated by a solution of carbonate of soda; the liquor is evaporated to dryness without filtering, the residue treated with water, the quina collected on a filter, washed until the filtrate ceases to react with nitrate of silver, and then dried at 100° C., and weighed. The filtered liquor and washings are evaporated to dryness, and the residue treated with alcohol, to remove the quina present. The alcoholic liquid is evaporated, dried at 100° C., weighed, and then calcined to deduct the inorganic matter taken up by the spirit.

When a sulphuric solution of quinine is precipitated by ammonia or soda, the precipitate must be washed until the washings cease to affect chloride of barium, because some subsulphate of quina is always thrown down with the precipitate. To recover the quina dissolved by washing, the liquors are evaporated to dryness and the residue treated with alcohol. M. Sestini gives the following formulæ for the arseniates of quinine analysed by him:—

$$2\,(C_{20}H_{24}N_2O_2)\,AsO_4H_3 + 8\,H_2O$$
$$2\,(C_{20}H_{24}N_2O_2)\,AsO_4H_3 + 6\,H_2O$$
$$C_{20}H_{24}N_2O_2\,AsO_4H_3 + 2\,H_2O$$

Some Combinations of Carbolic Acid.

M. J. Romei has described* several compounds of phenol with bases, which present, in some respects, the characters of definite salts.

Phenate of Potash.—This salt may be prepared in two ways, by solution and by fusion. If alcoholic solutions of 94 parts of phenol and 56 parts of hydrate of potash are mixed and evaporated, after cooling a crystalline mass is obtained of small micaceous plates, transparent and very refractive, which, dried over oil of vitriol, constitute pure phenate of potash. To prepare the salt by fusion, 37·4 parts of hydrate of potash are added little by little to 62·6 parts of phenol in the fused state, until the mass ceases to be perfectly homogeneous. The phenate of potash obtained by either of these processes always occurs in white transparent micaceous scales, which absorb moisture from the air, and become first yellowish and then reddish-brown. It fuses between 94° and 95° C., and crystallizes again on cooling. It is very soluble in water and alcohol; it also dissolves a little in washed ether, but very slightly in anhydrous ether. Phenate of potash contains no water of crystallization, but it always retains the water of composition of its respective constituents which cannot be separated without decomposing the compound; hence the author regards the body as only a molecular combination. The mean of four analyses gave the following results:—

	Found.	Theory.
Phenol	56·60	56·60
Hydrate of Potash	31·30	31·40
Water	12·00	12·00
	99·90	100·00

These numbers give the formula C_6H_6O, KHO. The phenate of potash in several cases, and principally as a disinfectant, can usefully replace phenol.

Phenate of Oxide of Copper.—This substance is prepared by reacting with an aqueous solution of 12 parts of sulphate of copper on an aqueous solution of 15 parts of phenate of potash. The solution of the metallic salt should be added to the solution of phenate of potash; by operating differently very variable compounds are obtained. The mixture should be left to repose for twenty-four hours. The phenate of copper thus obtained, and dried over sulphuric acid, is a green powder, soluble in acids; it does not fuse, and if heated

* 'Bulletin de la Société Chimique,' Février 1869.

several times is entirely decomposed. From four analyses it results, that this compound contains three molecules of hydrated oxide of copper, and two molecules of phenol;—

$$2(C_6H_6O),\ 3(Cu''H_2O_2)$$

From this compound, which contains 55·88 per cent. of oxide of copper, the water cannot be detached without entire decomposition.

Phenate of the Oxide of Mercury is obtained by double decomposition, as a precipitate of a bright orange colour, becoming brick-red after drying over sulphuric acid. This compound only dissolves in hydrochloric and nitric acids, and when treated with the latter, the solution assumes a bright golden-yellow colour. It contains 69·33 per cent. of hydrated oxide of mercury, and has the formula $C_6H_6O,\ HgO_2H_2$.

Phenate of Quinine.—To prepare this new compound, 8·72 parts of sulphate of quinine and 3 parts of phenate of potash are dissolved separately in alcohol, and the solution of the sulphate added little by little to that of the phenate; after twenty-four hours the precipitated sulphate of potash is removed by filtration, and the liquid evaporated by a gentle heat, and crystallized. The phenate of quinine forms fine needle crystals, almost insoluble in ether, very soluble in alcohol and acids, but insoluble in water. The compound gave by analysis 76·69 per cent. of quinine; while theory requires 77·51. The author regards it as the result of the union of a molecule of quinine with a molecule of phenol, and assigns to it the formula $C_{20}H_{24}N_2O_2,\ C_6H_6O$.

The author considers it demonstrated,—1st, that phenol can easily enter into combination with the bases to form very definite compounds; 2nd, that these compounds are simple juxtapositions of the molecules, because the individual constitution of each component is retained unchanged.

Use of Phenate of Potash to Detect Water in Ether.—As dry phenate of potash is almost insoluble in anhydrous ether, while hydrated ether partially dissolves it, and the undissolved part, after some time, becomes reddish-brown, the author applies these characters to detect water in ether. By this means he has recognized the presence of so small a quantity as 2·5 parts of water in 1000 of ether.

The Silvering of Glass.

Several methods have been published from time to time for coating mirrors and lenses with metallic silver by chemical deposition. Liebig recommends the following as being best suited for the purpose:—

a. 1 part of nitrate of silver is dissolved in 10 parts of water.

b. Pure nitric acid of commerce is saturated with carbonate of ammonia, and diluted until it has the density of 1·115; or, *c*, 242 grammes of sulphate of ammonia are dissolved in water, and the solution made up to 200 cubic centimetres.

d. Solution of caustic soda, free from chlorine, of a density of 1·05.

A. *The Silver Solution.*—This is prepared by adding 100 volumes of the solution of ammoniacal salt (*b* or *c*) to 140 volumes of the solution of silver (*a*), and then 750 volumes of the solution of soda (*d*) in small successive portions. After three days' repose, decant the bright liquor.

e. 50 grammes of white sugar-candy, and 3·1 grammes of tartaric acid are dissolved in a little water, and heated to ebullition for an hour, then diluted to 500 cubic centimetres.

f. 2·857 grammes of dry tartrate of copper are mixed with water, sufficient soda added, drop by drop, to effect solution, and then diluted to 500 cubic centimetres.

B. *The Reducing Solution.*—This is obtained by mixing equal volumes of *e* and *f*, and adding 8 volumes of water.

C. *The Silvering Mixture.*—50 volumes of A, 10 volumes of B, and 250 to 300 volumes of water. The temperature of the mixture should be 70° or 80° F.; if necessary, therefore, warm water may be used.

Ordinary glasses may be supported in this liquid vertically; but lenses, etc., destined for optical instruments should be suspended horizontally at the surface of the liquid. The layer of silver is brilliant, and of sufficient adherence to admit of polishing. The copper salt is necessary to the production of a uniform deposit.

The Substitution of Sodium for Phosphorus in Lucifer Matches.

The 'Chemical News' describes the result of some experiments by Dr. Fleck, of Dresden, on the manufacture of non-poisonous matches by the use of sodium in place of phosphorus. The paste employed is composed as follows:—

Sodium	0·5.
Nitrate of Potash	66·0.
Sulphide of Antimony	36·5.

The sodium is granulated by agitation in melted paraffin, and incorporated with the other well-dried ingredients in metal mortars under petroleum. The necessary adhesiveness is given to the mass by caoutchouc previously soaked in light petroleum oil.

A New Styptic Collodion.

Mr. Carlo Pavesi gives in the 'Gazette de Turin' the following form for a new collodion:—

Collodion	100.
Carbolic Acid	10.
Tannin	5.
Benzoic Acid	3.

Agitate until a perfect solution be formed. It is of a brownish colour, gives a pellicle similar to ordinary collodion, and instantly coagulates blood.

Iron Sugar.

A new preparation of iron has been recently introduced into medicine by M. C. Chautrand, under the name of *Sucre Ferrugineux*. It is in the form of small distinct cubical crystals of cane sugar, having a reddish-brown colour due to the presence of a portion of peroxide of iron in a soluble condition diffused in and upon each crystal. When introduced into cold water it dissolves, forming a deep red solution, only a trace of the oxide of iron remaining insoluble. If the solution be boiled or kept for some time, the oxide is precipitated.

This preparation appears to contain nothing but a pure hydrate of peroxide of iron associated with the cane sugar. The proportion of iron present is not large, but the compound is pleasant to the taste, and is intended to be taken in doses of two to four teaspoonfuls half an hour after meals.

Ammoniacal Extract of Valerian.

M. Dannecy has introduced into pharmacy an extract of valerian prepared with ammoniacal alcohol, which he names "Le valérianate extractif d'ammoniaque." It is prepared as follows:—100 grammes of coarsely-powdered valerian-root are introduced into a percolator, and a mixture of 80 grammes of alcohol at 140° F., and 20 grammes of solution of ammonia at 70° F., is poured on. When this liquid has passed through, sufficient spirit at 140° F. is employed to displace a weight of ammoniacal tincture, equal to that of the valerian operated on. This tincture is then evaporated, with constant stirring, at a temperature not exceeding 160° F., until a soft extract is obtained. The extract is administered in gelatinous capsules, each containing 5 decigrammes (7·7 grains).

HYDROGENIUM; THE RELATION OF HYDROGEN TO PALLADIUM.

It has been shown by Mr. Graham, the Master of the Mint,* that palladium, platinum, and some other metals, are capable, at an elevated temperature, of absorbing considerable quantities of hydrogen, which is afterwards retained when the metal has cooled, but may be separated by heating the metal *in vacuo*.

Palladium appears to possess the most remarkable property of thus absorbing hydrogen. At a temperature a little below that of boiling water, Graham found that one volume of palladium absorbed and retained 643 volumes of hydrogen.

Platinum possesses the same property, but in a lower degree. Speaking of this metal, Mr. Graham says, "It appears necessary to recognize in platinum a new property, a power to absorb hydrogen at a red heat, and to retain that gas at a temperature under redness for an indefinite time. It may be allowable to speak of this as a power to occlude (to shut up) hydrogen, and the result as the *occlusion* of hydrogen by platinum."

The term *occlusion* has thus been introduced to express the property in metals of absorbing gases.

In a paper communicated to the Royal Society on the 22nd May, 1868, "On the Occlusion of Hydrogen Gas by Metals," Mr. Graham described a new method of causing the absorption of hydrogen by metals, which consisted in making the metal the negative electrode of a voltaic arrangement, including six cells of a Bunsen's battery. When palladium was thus used, the evolution of oxygen gas at the positive electrode continuing copious, the effervescence at the negative electrode was entirely suspended for the first twenty seconds, in consequence of the hydrogen being occluded by the palladium. The final absorption amounted to 200 volumes.

Mr. Graham says, "It is worthy of remark that, although the hydrogen enters the palladium and no doubt pervades the whole mass of the metal in such circumstances, the gas exhibits no disposition to leave the metal and escape into a vacuum at the temperature of its absorption. Thus, a thin plate of palladium, charged with hydrogen in the manner described, was washed, dried by a cloth, and then sealed up in an exhausted glass tube. On breaking the tube under mercury after two months, the vacuum was found perfect. No hydrogen had vaporized in the cold (about 12° Cent.); but on the application afterwards of a heat of 100° Cent. and upwards, 333 volumes of gas were evolved from the metal."

"It appears, then, that when hydrogen is absorbed by palladium, the volatility of the gas may be entirely suppressed; and hydrogen may be largely present in metals without exhibiting any sensible tension at low temperatures. Occluded hydrogen is certainly no longer a gas, whatever may be thought of its physical condition. The same conclusion was indicated by another series of experiments, in which it was found that, to be occluded by palladium, and even by iron, hydrogen does not require to be applied under much pressure, but, on the contrary, when highly rarified is still freely absorbed by these metals.

"The occluded hydrogen is readily extracted from palladium by reversing the position of the latter in the decomposing cell of the battery, so as to cause oxygen to be evolved on the surface of the metal. The hydrogen is then drawn out as rapidly as it had previously entered the palladium, and the metal is exhausted in a complete manner by such treatment. When palladium charged

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* Philosophical Transactions, 1866.

with hydrogen is left exposed to the atmosphere, the metal is apt to become suddenly hot, and to lose its gas entirely by spontaneous oxidation."

Mr. Graham's last communication on this interesting subject was read before the Royal Society on the 14th of last January, and we shall probably insert it in our next number.

DOUBLE SALTS OF CARBOLIC ACID.

At the Royal Medical and Chirurgical Society a paper, by Dr. Arthur Ernest Sansom, on these new salts was read.

Modern research has established with a near approach to precision the doctrine that zymotic diseases are due to the influence of minute organized germs upon the body. In the case of vaccinia they seem to be demonstrable as minute granules. By inference, if not by observation, much can be learned concerning the physical qualities of these disease-producing organisms. They are capable of destruction by various chemical agencies; on this circumstance is based the theory and practice of disinfection. The agencies which destroy them are, however, not always chemical; some bodies which can be proved to have no chemical influence whatever have the peculiar property of arresting the vitality of organized bodies. Though means have been long adopted, in order to prevent the spread of disease, to neutralize disease-producing agencies externally to the living body, it is only lately that a plan of treatment has been pursued with the object of killing the vitally endowed disease-producing particles when once they have entered the living organism. The plan of treament by the sulphites recommended by Professor Polli no doubt destroys germs, sulphurous acid and the sulphites acting upon them not as chemical, but as vital poisons. Perhaps the most powerful agent known possessing a like property is carbolic acid. This, however, in regard to its administration, presents many practical difficulties. The difficulties have been overcome by the discovery and employment of salts obtained by the neutralization of sulpho-carbolic acid ($C_6H_6SO_4$) with the alkaline, earthy, and metallic bases. The first compound salt, sulpho-carbolate of potash, was obtained by Mr. Crookes, F.R.S. The author has succeeded in producing, in addition, the following salts, all having the characters of true double salts, and possessing brilliant and decidedly crystalline form; sulpho-carbolate of sodium, of potassium, of ammonium, of magnesium, of zinc, of copper, and of iron. An inquiry instituted with the view of determining the relative efficiency of the various salts in staying fermentative action established the following results:—1, the sodium salt; 2, magnesium; 3, potassium; 4, ammonium. It was shown from experiments upon the lower animals, as well as from the results of administration to the human subject, that the following was an outline of the plan of action of the sulpho-carbolates. They are absorbed with great rapidity, exert no toxic effect (the human subject readily taking drachm doses every four hours), are decomposed in the system into—*a*, carbolic acid, which, traversing the system, is exhaled by the breath; *b*, sulphate of soda, which permeates the tissues, and is excreted by the urine. Though carbolic acid cannot be detected in the tissues after death, it is shown that an influence enabling the body to resist putrefaction has been exerted; the urine passed also resists decomposition. Prolonged courses of sulpho-carbolate of sodium given for two months to phthisical patients show that the drug could be administered not only with impunity, but with considerable advantage. Of 35 cases, 13 greatly improved, 15 considerably improved; 9 cases gained in weight an average of 2½ lbs.—*Medical Times and Gazette.*

ON HYDROFLUORIC ACID.

BY G. GORE, F.R.S.

(*Abstract of a Paper read before the Royal Society.*)

A. Anhydrous Hydrofluoric Acid.

This paper contains a full description of the leading physical and chemical properties of anhydrous hydrofluoric acid, and also an account of various properties of pure aqueous hydrofluoric acid. The author obtained the anhydrous acid by heating dry double

fluoride of hydrogen and potassium to redness in a suitable platinum apparatus (shown by a figure accompanying the paper), and states the conditions under which it may be obtained in a state of purity.

The composition and purity of the anhydrous acid are shown and carefully verified by various methods of analysis, both of the double fluoride from which it was prepared and of the acid itself; and particulars are given of all the circumstances necessary to ensure reliable and accurate results. Nearly all the operations of preparing, purifying, analysing, and examining the properties of the acid were conducted in vessels of platinum, with lutings of paraffin, sulphur, and lampblack; articles of transparent and colourless fluor-spar were also employed in certain cases. Nearly all the manipulations with the acid were effected while the vessels containing it were immersed in a strong freezing-mixture of ice and crystallized chloride of calcium.

The pure anhydrous acid is a highly dangerous substance, and requires the most extreme degree of care in its manipulation. It is a perfectly colourless and transparent liquid at 60° F., very thin and mobile, extremely volatile, and densely fuming in the air at ordinary temperatures, and absorbs water very greedily from the atmosphere. It was perfectly retained in platinum bottles, the bottle having a flanged mouth with a platinum plate secured with clamp-screws, and a washer of paraffin.

A number of attempts were made, finally with success, to determine the molecular volume of the pure anhydrous acid in the gaseous state, the acid in these cases being prepared by heating pure anhydrous fluoride of silver with hydrogen in a suitable platinum apparatus over mercury. Particulars are given of the apparatus employed and of the manipulation. The results obtained show that one volume of hydrogen, in uniting with fluorine, produces not simply one volume of gaseous product as it does when uniting with oxygen, but two volumes, as in the case of its union with chlorine. The gaseous acid transferred to glass vessels over mercury did not corrode the glass, or render it dim in the slightest degree during several weeks, provided that moisture was entirely absent.

The author concludes that the anhydrous acid he has obtained is destitute of oxygen, not only from the various analyses and experiments already referred to, but also—1st, because the double fluoride from which it was prepared, when fused and electrolysed with platinum electrodes, evolved abundance of inflammable gas at the cathode, but no gas at the anode, although oxides are by electrolysis decomposed before fluorides; 2nd, because the electrolysis of the acid with platinum electrodes yielded no odour of ozone, whereas the aqueous acid of various degrees of strength evolved that odour strongly; and, 3rd, because the properties of the acid obtained from hydrogen and fluoride of silver agree with those of the acid obtained from the double salt. He considers also that the acid obtained from pure fluor-spar and monohydrated sulphuric acid heated together in a platinum retort is free from oxygen and water.

The specific gravity of the anhydrous liquid acid was several times determined, both in a specific-gravity bottle of platinum, and also by means of a platinum float submerged and weighed in the acid. Concordant and reliable results were obtained; the specific gravity found was 0·9879 at 55° F., that of distilled water being = 1·000 at the same temperature.

The anhydrous acid was much more volatile than sulphuric ether. Its boiling-point was carefully determined in a special apparatus of platinum, and was found to be 67° F. Not the slightest sign of freezing occurred on cooling the acid to — 30° F. (= −35·5° C.); and it is highly probable that its solidifying temperature is a very great many degrees below this. Its vapour-tension at 60° F. was also approximately determined, and was found to be = 7·58 lbs. per square inch. On loosening the lid of a bottle of the acid at 60° F. the acid vapour is expelled in a jet like steam from a boiler; this, together with the low boiling-point, the extremely dangerous and corrosive nature of the acid, and its great affinity for water, illustrates the very great difficulty of manipulating with it and retaining it in a pure state. Nevertheless, by the contrivances described, and by placing the bottles in a cool cellar (never above a temperature of 60° F.), the author has succeeded in keeping the liquid acid perfectly, without loss and unaltered, through the whole of the recent hot summer.

The electrical relations of different metals, etc., in the acid were found to be as follows at 0° F.:—Zinc, tin, lead, cadmium, indium, magnesium, cobalt, aluminium, iron, nickel, bismuth, thallium, copper, iridium, silver, gas-carbon, gold, platinum, palladium.

Numerous experiments were made of electrolysing the anhydrous acid with anodes of gas-carbon, carbon of lignum-vitæ, and of many other kinds of wood, of palladium, platinum, and gold. The gas-carbon disintegrated rapidly; all the kinds of charcoal flew to pieces quickly; and the anodes of palladium, platinum, and gold were corroded without evolution of gas. The acid with a platinum anode conducted electricity much more readily than pure water; but with one of gold it scarcely conducted at all. These electrolytic experiments presented extreme difficulties, and were conducted in a platinum apparatus (shown by a figure) specially devised for the purpose. The particulars of the conditions and results obtained are described in the paper. Various mixtures of the anhydrous acid with monohydrated nitric acid, with sulphuric anhydride, and with monohydrated sulphuric acid were also electrolysed by means of platinum anodes, the particulars and results of which are also described.

To obtain an idea of the *general* chemical behaviour of the pure anhydrous acid, numerous substances (generally anhydrous) were immersed in separate portions of the acid in platinum cups, kept at a low temperature (0° to −20° F.). The acid has scarcely any effect upon any of the metalloids or noble metals; and even the base metals in a state of fine powder did not cause any evolution of hydrogen. Sodium and potassium behaved much the same as with water. Nearly all the salts of the alkali and alkaline-earth metals produced strong chemical action. Various anhydrides (specified) dissolved freely. Strong aqueous hydrochloric acid produced active effervescence. The alkalies and alkaline earths united strongly with the acid. Peroxides gave no effect. Numerous oxides (specified) produced strong chemical action, some of them dissolving. Some nitrates were not chemically affected; others (those of lead, barium, and potassium) were decomposed. Fluorides generally were unchanged; but those of the alkali-metals and of thallium produced different degrees of chemical action, those of ammonium, rubidium, and potassium uniting powerfully. Numerous chlorides were also unaffected, whilst those of phosphorus (the *solid* one only), antimony (the perchloride), titanium, and of the alkaline-earth and alkali metals were decomposed with strong action, and generally with effervescence. The chlorates of potassium and sodium were also decomposed with evolution of chloric acid; the bromides of the alkaline-earth and alkali metals behaved like their chlorides. Bromate of potassium rapidly set free bromine. Numerous iodides were unaffected; but those of the alkaline-earth and alkali metals were strongly decomposed, and iodine (in some cases only) set free. The anhydrous acid decomposed all carbonates with effervescence, and those of the alkaline-earth and alkali metals with violent action. Borates of the alkalies also produced very strong action. Silico-fluorides of the alkali metals dissolved with effervescence. All sulphides, except those of the alkaline-earth and alkali metals, exhibited no change; the latter evolved sulphuretted hydrogen violently. Bisulphite of sodium dissolved with effervescence. Sulphates were variously affected. The acid chromates of the alkali metals dissolved with violent action to blood-red liquids, with evolution of vapour of fluoride of chromium. Cyanide of potassium was violently decomposed, and hydrocyanic acid set free. Numerous organic bodies (specified) were also immersed in the acid; most of the solid ones were quickly disintegrated. The acid mixed with pyroxylic spirit, ether, and alcohol, but not with benzole; with spirit of turpentine it exploded, and produced a blood-red liquid. Gutta percha, india-rubber, and nearly all the gums and resins were rapidly disintegrated, and generally dissolved to red liquids. Spermaceti, stearic acid, and myrtle wax were but little affected, and paraffin not at all. Sponge was also but little changed. Gun-cotton, silk, paper, cotton-wool, calico, gelatine, and parchment were instantly converted into glutinous substances, and generally dissolved. The solution of gun-cotton yielded an inflammable film on evaporation to dryness. Pine-wood instantly blackened.

From the various physical and chemical properties of the anhydrous acid, the author concludes that it lies between hydrochloric acid and water, but is much more closely allied to the former than to the latter. It is more readily liquefied than hydrochloric acid, but less readily than steam: like hydrochloric acid it decomposes all carbonates; like water it unites powerfully with sulphuric and phosphoric anhydrides, with great evolution of heat. The fluorides of the alkali metals unite violently with hydrofluoric acid, as the oxides of those metals unite with water; the hydrated fluorides of the alkali metals also, like the hydrated fixed alkalies, have a strongly alkaline reaction, and are capable of expelling ammonia from its salts. It may be further remarked that the

atomic number of fluorine lies between that of oxygen and chlorine; and the atomic number of oxygen, added to that of fluorine, nearly equals that of chlorine.

B. Aqueous Hydrofluoric Acid.

Under the head of the aqueous acid the author enumerates the various impurities usually contained in the commercial acid, and describes the modes he employed to detect and estimate them, and to estimate the amount of HF in it. The process employed by him for obtaining the aqueous acid in a very high degree of purity from the commercial liquid is also fully described. It consists essentially in passing an excess of sulphuretted hydrogen through the acid, then neutralizing the sulphuric and hydrofluosilicic acids present by carbonate of potassium, decanting the liquid after subsidence of the precipitate, removing the excess of sulphuretted hydrogen by carbonate of silver, distilling the filtered liquid in a leaden retort with a condensing-tube of platinum, and, finally, rectifying.

The effect of cold upon the aqueous acid was briefly examined, the result being that a comparatively small amount of hydrofluoric acid lowers the freezing-point of water very considerably.

The chemico-electric series of metals, etc., in acid of 10 per cent. and in that of 30 per cent. were determined. In the latter case it was as follows:—Zinc, magnesium, aluminium, thallium, indium, cadmium, tin, lead, silicon, iron, nickel, cobalt, antimony, bismuth, mercury, silver, copper, arsenic, osmium, ruthenium, gas-carbon, platinum, rhodium, palladium, tellurium, osmi-iridium, gold, iridium. Magnesium was remarkably unacted upon in the aqueous acid. The chemico-electric relation of the aqueous acid to other acids with platinum was also determined.

Various experiments of electrolysis of the aqueous acid of various degrees of strength were made with anodes of platinum. Ozone was evolved, and, with the stronger acid only, the anode was corroded at the same time. Mixtures of the aqueous acid with nitric, hydrochloric, sulphuric, selenious, and phosphoric acids were also electrolysed with a platinum anode, and the results are described.

OBSERVATIONS ON FERRIC HYDRATE, THE SO-CALLED SOLUBLE PEROXIDE OF IRON.

BY PROFESSOR ATTFIELD, PH.D.

In a memoir, noticed in the 'Chemical News' of June 12 as having been recently presented to the Academy of Sciences, M. Jeannel, in allusion to the fact that ferric hydrate is not always soluble in acids, states that the incomplete solubility is, in his opinion, generally due to the influence of traces of sulphates. He says, according to the Paris correspondent of the 'Chemical News,' "sesquioxide, precipitated from the persulphate, is always to a certain extent insoluble, or yields unstable salts; the same is the case with the sesquioxide precipitated from the perchloride, when this has been contaminated by sulphuric acid, or equally when the alkalies employed as precipitants have been so contaminated, or, finally, when the ferric hydrate, precipitated from pure solutions by pure alkalies, has been washed with common water." This explanation does not accord with my experience of the properties of ferric hydrates and oxyhydrates. Firstly, in England the ferric citrates and tartrates used in medicine are successfully made in large quantities by dissolving ferric hydrate, prepared from ferric sulphate, in solutions of the respective acids and acid-salts. Secondly, I have frequently seen moist ferric hydrate perfectly dissolve in solutions of acids or acid-salts, even though the precipitate has been washed with common water containing sulphate of calcium, a final washing with distilled water having, for various reasons, been neglected. Thirdly, I have often noticed that *pure* ferric hydrate, soluble when freshly precipitated, becomes imperfectly so if long kept, moist or dry. It is true that when alkali is added to solution of ferric sulphate, instead of the latter to the former, an insoluble oxysulphate is precipitated, and a similar compound may, possibly, be formed under other circumstances; but ferric hydrate, properly prepared and fairly washed, is readily soluble if only it be used in the moist and recently precipitated condition, with a solution of acid or acid-salt which is not too weak, and the mixture be not boiled or even strongly heated for any

considerable length of time. The fact is that ferric hydrate, even though kept under water, decomposes after a time, or more quickly if heated, losing the elements of water, and becoming an oxyhydrate, a body insoluble in weak acids and, also unlike ferric hydrate, incapable of acting as an antidote to arsenic, that is, incapable of forming ferrous arseniate.

It may be useful again to draw attention to the decided alteration in properties which ferric hydrate spontaneously undergoes when exposed beneath the surface of water, or when boiled with water, as evidence that this substance (Fe_2 6 HO) is a true analogue of hydrate of sodium (Na HO), etc., and not a hydrous ferric oxide (Fe_2O_3, 3 H_2O). It is more reasonable to suppose that in acquiring new properties ferric hydrate becomes changed to new compounds than to consider that the changes result from the loss of a portion of water already existing as water. Between ferric hydrate (Fe_2 6 HO) and ferric oxide (Fe_2O_3) there would appear to be several oxyhydrates, analyses, etc., of most of which have already been given in the 'Chemical News' (xvii. 56) by Brush and Rodman.

1. Fe_4 12 HO.
2. Fe_4O 10 HO.
3. Fe_4O_2 8 HO.
4. Fe_4O_3 6 HO.
5. Fe_4O_4 4 HO.
6. Fe_4O_5 2 HO.
7. Fe_4O_6.

In the above formulæ, No. 1 represents two molecules of ferric hydrate; Church found a stalactite of true ferric hydrate, native, in Cornwall, and Wittstein gives a similar formula to fresh artificial ferric hydrate. No. 2 is the only oxyhydrate, in this series, still unknown, unless, indeed, Haughton's Kilbride mineral contains this body. No. 3 is brown iron-ore from the Hüttenrode Hartz. No. 4 is the formula of a limonite and of artificial ferric hydrate altered by age,—described by Wittstein as having a crystalline structure. No. 5 is the mineral gothite, and also the dried oxyhydrate commonly used in pharmacy. No. 6 is turgite, hydro-hematite, or the mineral from Salisbury, Conn., analysed by Brush and Rodman. No. 7 represents two molecules of ferric oxide.—*Chemical News.*

As stated in the March number of the 'Pharmaceutical Journal,' M. Jeannel prepares a ferric precipitate, which is soluble, not only in solutions of weak acids or acid-salts, but even in water. The substance appears to be a mixture of ferric hydrate, or, when dried, oxyhydrate, with a small quantity of ferric oxychloride or oxynitrate. This compound merits further investigation. Hitherto peroxide and perhydrate of iron, pure or impure, have only been dissolved in water under the extraordinary conditions of dialysis. It would be especially interesting to know whether or not M. Jeannel's compound in the dry, or even in the moist, state is an efficient permanent antidote to arsenic.—J. A.

ON NEW EXPLOSIVE POWDERS.

BY M. DESIGNOLLE.

Many improvements having lately been made in the art of war, and particularly in the adoption of breech-loading arms, the want has been felt of new powders to meet the requirements of the present artillery. This want has been supplied by M. Designolle, who has invented a new system of powders of which carbazotate or picrate of potash is the base. These powders are of four kinds, viz. a musket powder, gunpowder for short bore cannons, slow gunpowder for cannons with long bores, and an explosive powder for torpedoes and projectiles destined for the undermining of fortifications. The principal advantages of these new powders are the following:—Increase of balistic power without increase of explosive power; the base remaining the same, possibility of regulating and varying the effects between the limits of one to ten; also of regulating, at will, the rapidity of combustion of this powder, and of increasing the balistic power without changing the mode of manufacture. Other advantages are—regularity in the manner of action; suppression of sulphur, and consequently of the vapours of sulphide of potassium and sulphuretted hydrogen; absence of action on metals and almost entire suppression of smoke. Into the explosive powders only two components enter—picrate of potash

and nitrate of potash; the musket and gun powders contain carbon in addition to the above-named ingredients. To prepare these powders, the ingredients are beaten from three to six hours with a proportion of water varying from 6 to 14 per cent., according to the nature of the mixture; the powder is condensed by means of the hydraulic press, with a pressure of from 30,000 to 100,000 kilos., graining of the powder, and pressing and drying it according to the methods employed for the black powder. In order to increase the balistic power, the relative proportion of picrate of potash in the mixture must be increased. For musket powder it has been proved that not more than 20 per cent. of picrate of potash is required, while for gunpowders its proportion varies from 8 to 15 per cent. This component (picrate of potash) is of a beautiful golden-yellow colour, and crystallizes into prismatic needles possessing a brilliant reflection; it is insoluble in alcohol, but soluble in about 260 parts of water at 15° or 14 parts of boiling water. Heated with care, it becomes orange-red at a temperature of 300°, but, on cooling, it assumes its original colour. Heated to 310°, it detonates with violence. The researches of M. John Casthellaz on the action of nitric acid on phenic acid improved the method of manufacturing picric acid, and produced chemically pure picrate of potash at such a reasonable price that the new powders are not more expensive than ordinary black powder.

MM. Designolle and Casthellaz give the following proportions for preparing deflagrating mixtures with coloured flames:—

Golden fire	Picrate of ammonia .	50
	Picrate of iron . .	50
Green fire	Picrate of ammonia .	48
	Nitrate of barytes .	52
Red fire .	Picrate of ammonia .	54
	Nitrate of strontian .	46

—*Chemical News; abstracted from the Bulletin de la Société d'Encouragement.*

ON THE COPAL OF ZANZIBAR.

Extract from a Letter from JOHN KIRK, M.D., F.L.S., *dated Zanzibar, March* 20, 1868.

The vegetation along the creek of Dan Salam * consists of many curious, and, to me, unknown bushes, with heavy timber scattered here and there; among them was the *Trachylobium Mossambicense*, Kl., distinguished by its rounded head of glossy leaves, with white groups of flowers projecting from the points of the branches. This is the "M'ti Sandarusi" (Tree of Copal) of the natives; and from it one variety of Copal is obtained. On examining the tree more closely, the trunk and main limbs were seen to be covered with the clear resinous exudation, now brittle and hard; from the upper branches it dropped down on the ground below, but not in a fluid state. To judge by the appearance it presented, I should say that the resin soon dries and hardens after being exuded, but must be easily broken off by violence; pieces of various tint and form were collected, some with insects imbedded; but all presented a smooth polished exterior, quite free from any pitting or "gooseskin" found on all kinds dug up from the ground. This sort is known in trade as "Sandarusi ya m'ti," or Copal from the tree; it is exported in considerable quantity to India, but not to Europe. Having thus established the source of one sort of Copal to be the *Trachylobium*, and transmitted the resin with full herbarium specimens of flower and fruit (which, if I mistake not, are to this day desiderata in all our collections), let me briefly state my reasons for thinking that in this tree we have the source of the older Zanzibar Copal, the semifossil or bituminized resin known in the English market as "Animé," and which is the most valuable of all resins for the manufacture of varnish, exceeding anything produced on the west coast for hardness, elasticity, and polish.

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* [Dan Salam is stated in the letter to be a spacious creek opposite the southern end of Zanzibar Island.—ED.]

There are three distinct kinds of Copal in the Zanzibar trade, subdivided by merchants into many classes, according to colour, form, surface, and other peculiarities known to those in the trade, and affecting the value variously in different markets:—first, we have "Sardarusi-m'ti," Tree-Copal; second, "Chakazzi," or Copal dug from the soil, but modern (seemingly) in origin, and obtaining a price like that of the former quality; the third is the true Sandarusi, like the second, dug from the soil, but hard, less soluble, and more than twice the value. This forms by far the greatest part of Zanzibar Copal, the export of which has sometimes reached 800,000 lbs. at a value of £60,000.

I have already described the "Tree-Copal:" it is gathered directly from the tree, which is known along the coast from Mozambique to near Lamo, or from 3° to 15° south lat., but is most common between Cape Delgado and Mombas. The *Trachylobium Mossambicense*, Kl., is found along the creeks and on the maritime plain or the old sea-beach, but becomes very rare at a little distance inland, and quite unknown long before the change in geologic structure offers an explanation of its absence. It requires the near presence of the sea for its growth, and dies when far removed from its influence.

The second sort, or "Chakazzi" gum, is found in the ground at the roots of modern Copal-trees, or in the country where these exist; but it is also, I am told, to be got with true Copal. That it is found near the existing forests is certain; and there the true Copal is not known; and we must accept with caution the statement that it is also found in the interior, from this well-known fact, that our informants habitually mix the inferior coast-gum with the valuable produce of the interior. This "Chakazzi" is obviously the recent gum which has remained a short time in the soil after the death of the tree which produced it, yet long enough to take the impression of sand and stone, or other hard matter, as the hardest sealing-wax long left on a coin will take the impression, or as ice will flow down a valley.

The Tree-Copal, or "Animé" of the English markets, is undoubtedly the produce of forests now extinct; for there is no tree now growing at a distance from the coast which produces it. It is obtained all along the ancient sea-beach, the maritime plain which here fringes the Continent to a depth of 20–40 miles in general. Some spots are richer than others, and some soils indicate good "diggings." When the rains which follow the north-east monsoon have softened the soil, the natives of the country commence to dig this from small pits, searching the soil as removed; but there is no system, and, like the gold-washings of Africa, so the Copal-regions yield not a fraction of what a little system and industry might produce. At present every clan-feud stops the search. The producer receives, even when successful, only a trifle from the Indian merchants, who again part with it, often paying enormous dues to the Zanzibar State, to the European and American traders. The supply, considering the extent over which it is scattered, seems unlimited; for at present, with most inadequate means and much discouragement to the labourers, the amount obtained is very great.

If we take into account the similarity of the recent and fossil resins in appearance, their near approach in physical properties, the fact that the recent gum, often being imbedded in sand, takes the characteristic surface-markings, and recollect that where now the good Copal is dug as a fossil the present Copal-tree, in all probability, once grew, when the sea was nearer to the hills than now,—I think we may be satisfied that the *Trachylobium* was the source of the old Copal, which is the resin only modified by time and long exclusion from air and light under the ground.

Perhaps it may be asked, Is there not proof in the gum itself that the *Trachylobium* then existed? I have as yet found none: insects (all of them aerial) are often preserved; sometimes branches and leaves; but I have not seen evidence of the Copal-tree. When we remember that the resin soon hardens after being exuded, and that it runs from the underside of the main limbs, while the leaves, flowers, and fruit are at the extremities of the branches, we shall see that leaves of the underwood which sweep the lower branches are much more likely to be embalmed than the leaf of the tree itself, which, besides, is hairy, glossy, and unlikely to adhere. If a part of the modern tree were found in the old hard gum, the proof would be complete; at present some doubt remains.

I have sent not only full herbarium specimens, but also specimens of the recent gum, of the "Chakazzi," and of the valuable Copal, in which are many insects; and I would suggest that entomologists should assist us by their opinions whether these belong to existing species or not.—*The Journal of the Linnean Society.*

A NOVEL METHOD OF CATCHING MICE.

Having on several occasions noticed mice in our seed barrels, I bethought me of some method of how I might trap the little intruders; they having gained entrance by eating through the chime. To kill them with a stick was impracticable, as the little fellows would invariably escape as soon as the lid was raised to any height. I then thought of saturating a piece of cotton with chloroform and throwing it in and then closing the lid. On raising it again in a few minutes, I would find that life had almost or quite departed. Having on one occasion left the piece of cotton in the barrel, on again returning, found three little mice with their heads in close contact with it, and dead. In the evening I saturated another piece and placed it in the barrel, and on opening it the next morning to my surprise I found *nine dead mice.—American Journal of Pharmacy.*

DEATH FROM THE APPLICATION OF CARBOLIC ACID.

At the Worcester Infirmary, the death of one of the patients has been caused through a mistake in applying a remedy intended for another patient. It appears that Thomas Price, aged 34, was an in-patient in the infirmary, and under treatment for urinary fistula of the perinæum. His case had been attended to by Mr. Sheppard, one of the surgeons, who had performed an operation, and the patient was going on well. There was another patient, named Freeman, in the institution being treated for a similar complaint, and for him Mr. Budd, another of the hospital surgeons, prescribed an enema of carbolic acid oil in the proportion of 1 in 12. Mr. Budd stated that carbolic acid oil was commonly used as a lotion to wounds and ulcers for antiseptic purposes. It was a deadly poison, and somewhat analogous in its action to prussic acid. Carbolic acid was not required in Price's case at all. The prescription for Freeman was handed to the nurse, who took it to the dispenser, Mr. Harding; but the patient's card, bearing his name, got lost, and the dispenser asking the nurse who was the patient that had a fistula, she said Price, on which the carbolic acid mixed with water (not oil) was used for him. When the nurse was applying it the patient suddenly fell in a fit and became stertorous. The house surgeon, Mr. Knapp, was called in, and, seeing what had been done, he syringed out the rectum with hot water; but, although the patient slightly rallied, he died in about twenty minutes. The coroner's jury returned a verdict to the effect that "the patient died from the effects of the carbolic acid, but that there was no evidence to show that any person was guilty of gross negligence."

Subsequently, an inquiry into the case was instituted by the authorities at the Infirmary, from which it would appear to have been an act of carelessness on the part of the dispenser, who having neglected to make the prescription up on the day on which it was ordered, dispensed it on the following day from memory. At a special meeting of the Governors a resolution was adopted to the effect that the death of the patient had resulted from the gross negligence of the dispenser, and recommending that he should be prosecuted for manslaughter.

A numerous meeting of the governors was held to consider this Report, at which Lord Beauchamp moved, as an amendment, the omission of the clause recommending the prosecution of the dispenser, of whose negligence he had no doubt, but he was of opinion that there was a great want of supervision in the Institution. The amendment was carried by 34 votes to 6. His Lordship then gave notice of a motion for the appointment of a special committee "to inquire into and report upon the organization of the infirmary, and the duties of all the officers and persons employed."

It may be interesting, as bearing on this unfortunate case, to quote Dr. S. W. Mitchell, a member of the National Academy of Sciences, U.S.A., who, in a communication "On the Venom of Serpents" ('Medical Times and Gazette,' February 6), speaks of the application of carbolic acid in cases of snake-bites, and observes that it merely delays death, and lessens the local symptoms; that the reason for this comes out distinctly when the weakest solution of carbolic acid is allowed to run over the living mesentery while the

microscope is turned upon it. There is instant arrest of the local circulation wherever it goes. Check circulation, and you check absorption, or retard it; and this is why carbolic acid "slows" the venom-poisoning. Dr. Mitchell states that in no internal dose was it of any use to bitten animals, and that he succeeded in killing many of them with the remedy while trying to effect a cure; and he wonders at the freedom with which it has been employed in Great Britain in and on wounds, and has constantly expected to hear of deaths from its external application.

A BILL TO AMEND THE "ADULTERATION OF ARTICLES OF FOOD OR DRINK ACT, 1860," AND TO EXTEND ITS PROVISIONS TO DRUGS.

Whereas the practice of adulterating articles of food and drink and drugs for sale, in fraud of her Majesty's subjects, and to the great hurt of their health and danger to their lives, requires to be repressed by more effectual laws than those which are now in force for that purpose:

Be it therefore enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same as follows:

1. Every person who shall admix, and every person who shall order any other person or persons to admix, with any article of food or drink any injurious or poisonous ingredient or material to adulterate the same for sale, and every person who shall admix, and every person who shall order any other person or persons to admix, any ingredient or material with any drug to adulterate the same for sale, shall for the first offence forfeit and pay a penalty not exceeding *fifty pounds* together with the costs attending such conviction, and for the second offence shall be guilty of a misdemeanor and be imprisoned for six calendar months with hard labour.

2. Every person who shall sell any article of food or drink with which to the knowledge of such person any ingredient or material injurious to the health of persons eating or drinking such article has been mixed, and every person who shall sell as pure and unadulterated any article of food or drink, or any drug which is adulterated or not pure, shall for every such offence, on a summary conviction of the same before two justices of the peace at petty sessions in England, and in Scotland before two justices of the peace in the justices of the peace court, or before the sheriff substitute of the county, or before justices at petty sessions or a divisional justice in Ireland, forfeit and pay a penalty not exceeding *twenty pounds*, together with such costs attending such conviction as to the said justices shall seem reasonable; and if any person so convicted shall afterwards commit the like offence, it shall be lawful for such justices of the peace to cause such offender's name, place of abode, and offence to be published at the expense of such offender, in such newspaper or in such other manner as to the said justices shall seem desirable.

3. In the city of London and the liberties thereof the commissioners of sewers of the city of London and the liberties thereof, and in all other parts of the metropolis the vestries and district boards acting in execution of the Act for the better local management of the metropolis in England and Ireland, the court of quarter sessions of every county, and the town council of every borough having a separate court of quarter sessions, and in Scotland the commissioners of supply at their ordinary meetings for counties, and town councils within the several jurisdictions, shall, for their respective city, districts, counties, or boroughs, appoint and remove one or more persons possessing competent medical, chemical, and microscopical knowledge as analysts of all articles of food, drink, and drugs purchased within the said city, metropolitan districts, counties, or boroughs, and shall pay to such analysts such salary or allowances as they may think fit; but such appointments and removals shall at all times be subject in Great Britain to the approval of one of her Majesty's principal Secretaries of State, and in Ireland to that of the Lord Lieutenant.

4. In Great Britain one of her Majesty's principal Secretaries of State, and in Ireland the Lord Lieutenant, shall appoint one or more persons to act as commissioners to confer with and assist the local authorities in carrying out and enforcing this Act.

5. The inspector of nuisances or the inspector of weights and measures, or the inspector of markets, one or all of them as the local authority appointing them shall think fit to determine, in every district, county, city, or borough shall procure and submit

samples of articles of food or drink and drugs suspected to be adulterated to be analysed by the analysts appointed under this Act, and shall, upon receiving a certificate stating that the articles of food or drink or drugs are adulterated, cause a complaint of an offence against this Act by the party selling or adulterating such articles of food or drink or drugs to be made before a justice of the peace, and thereupon such justice shall issue a summons requiring the seller or the adulterator to appear before two justices of the peace at petty sessions in England, and in Scotland before two justices of the peace in the justice of the peace court, or before the sheriff substitute of the county, or before justices of petty sessions or divisional justices in Ireland, to answer such complaint, and such summons shall be served by delivering the same, or a true copy thereof, upon the premises where such samples were obtained or sold, and the expense of such prosecutions, if not ordered to be paid by the party complained against, shall be deemed part of the expense of executing this Act.

6. The analysts appointed under this Act shall report quarterly to the local authorities appointing them the number of articles of food, drink, or drugs analysed by them under this Act during the foregoing quarter, and shall specify the nature and kind of adulterations detected in such articles of food, drink, and drugs, and all such reports shall be read at the meetings of the local authorities appointing such analysts.

7. On the hearing by the justices of any complaint under this Act in any district, county, city, or borough wherein analysts shall have been appointed under this Act, the purchaser, or inspector of nuisances, or the inspector of weights and measures, or the inspector of markets, as the case may be, shall prove to the satisfaction of such justices that the article of food or drink or drugs alleged to be adulterated was delivered to the analysts in the same condition as regards its purity or impurity as it was when received from the seller.

8. Any purchaser of any article of food or drink or drugs in any district, county, city, or borough where there is any analyst appointed under this Act shall be entitled, on payment to the inspector or inspectors appointed under this Act of a sum not less than one shilling nor more than five shillings, to have any such article analysed by any analyst who may be appointed for such district, county, city, or borough, and to receive from such analyst a certificate of the result of his analysis, specifying whether, in his opinion, such article is adulterated, and also, whether, if it be an article of food or drink, it is so adulterated as to be injurious to the health of persons eating or drinking the same, and such certificate, duly signed by such analyst, shall, in the absence of any evidence before the justices, or in any court of justices to the contrary, be sufficient evidence of the matters therein certified, and the sum so directed to be paid for such certificate shall be deemed part of the costs.

9. All articles of food, drink, or drugs to be analysed by the analysts appointed under this Act shall be received by the inspectors appointed by the local authorities, and from all such articles of food, drink, or drugs, samples shall be taken and sealed in the presence of the analysts by the inspectors, to be retained by them and produced in case the justices shall order other analyses to be made under clause of this Act.

10. Any person who has been convicted of any offence punishable by this Act by any justices may appeal to the next general or quarter sessions of the peace which shall be held for the city, county, town, or place wherein such judgment or conviction shall have been made, or in the case of the conviction having been before a sheriff substitute in Scotland, then the appeal shall be to the sheriff of the county, provided that such person enter into a recognizance within two days next after such conviction, with two sufficient sureties, conditioned to try such appeal, and to be forthcoming to abide the judgment and determination of the court at such general or quarter sessions, or sheriff, and to pay such costs as shall be by such court awarded; and the justices before whom such conviction shall be had are hereby empowered and required to take such recognizance; and the court at such general or quarter sessions, or sheriff, are hereby authorized and required to hear and finally determine the matter of every such appeal, and may award such costs to the party appealing or appealed against as they shall think proper.

11. If any such conviction or judgment or order of forfeiture shall happen to be made within six days before any general or quarter sessions of the peace shall be held for the city, county, town, or place wherein such conviction shall have been made, the person who shall think himself aggrieved by any such conviction may, on entering into a recognizance in manner and for the purposes before directed, be at liberty to appeal

either to the then next or next following general or quarter sessions of the peace which shall be held for any such city, county, town, or place wherein any such conviction shall have been made, on giving six days notice to the complainant of his intention to appeal.

12. Any person who shall have been convicted by any justices or sheriff substitute of any offence punishable by this Act, in respect of the selling of any article of food or drink or drugs which shall have been manufactured according to any process patented before the passing of this Act, either by the patentee or owner of the patent, or by any person carrying on his business or otherwise claiming under him during the continuance of such patent, may, instead of appealing to the general or quarter sessions of the peace or sheriff of the county, apply in writing within five days after such conviction to the justices or sheriff substitute, to state and sign a case for the opinion of one of the superior courts of law thereon, in like manner as under the statute of the twentieth and twenty-first years of her Majesty, chapter forty-three, he might have applied to the justices to state and sign a case, and thereupon all such proceedings shall take place upon and in relation to such application, and all such provisions shall be applicable thereto, as would have taken place upon and in relation thereto, and been applicable thereto, under the provisions of the said last-mentioned Act; and in Scotland, for the purposes of such appeal, the justices or sheriff substitute may state and sign a case for the opinion of the Court of Session, in like manner as the justices in England and Ireland may, for the opinion of the superior courts of law under the said Act, and the Court of Session shall have in relation thereto the like powers as the superior courts have under the said Act, and all the other provisions of the said Act shall be applicable to such appeals.

13. In England the provisions in the "Nuisances Removal Act for England, 1855," as to procedure, and the provisions of the Act of the eleventh and twelfth years of the reign of her present Majesty, intituled "An Act to facilitate the Performance of the Duties of Justices of the Peace and of Sessions within England and Wales with respect to summary Convictions and Orders," and in Scotland the ordinary rules regulating the procedure of justices of the peace, so far as the same are respectively applicable, shall extend and apply to cases arising under this Act in England or Scotland; and all monies arising from penalties under this Act in any county, city, district, or borough where there are analysts appointed under this Act shall, when paid or recovered, be paid in England and Ireland to the vestry, district board, commissioners, county treasurer, or town council for such county, city, district, or borough respectively, to be applied for the general purposes of such vestry, district board, commissioners, county, city, or borough respectively, and to the collector of rogue money for each county in Scotland.

14. All proceedings under this Act in Ireland as to compelling the appearance of any such person or of any witness, and as to the hearing and determination of such complaints, and as to the making and executing of such orders, and as to the applications of fines, amerciaments, and forfeited recognizances imposed or levied under this Act at petty sessions, shall be subject in all respects to the provisions of "The Petty Sessions (Ireland) Act, 1851," as the same is amended by "The Petty Sessions Clerk (Ireland) Act, 1858" (when the case shall be heard in any petty sessions district), and to the provisions of the Acts relating to the divisional police offices (when the case shall be heard in the police district of Dublin metropolis), so far as the said provisions shall be consistent with any special provisions of this Act: and when any fine or penalty is imposed at any of the divisional police offices of Dublin metropolis, or by the justices in any corporate town, under the provisions of this Act, such fines and penalties shall be paid over to the same purposes and appropriated and applied in the same manner as is now by law authorized in respect of fines and penalties imposed at such divisional police offices, or by the justices in any such corporate town respectively.

15. In Ireland any person who has been convicted of any offence punishable by this Act may appeal to the next court of quarter sessions to be held in the same division of the county where the order shall be made by any justice or justices in any petty sessions district, or to the recorder at his next sessions where the order shall be made by the divisional justices in the police district of Dublin metropolis, or to the recorder of any corporate or borough town when the order shall be made by any justice or justices in such corporate or borough town (unless when any such sessions shall commence within seven days from the date of any such order, in which case, if the appellant sees fit, the

appeal may be made to the next succeeding sessions to be held for such division or town); and it shall be lawful for such court of quarter sessions or recorder, as the case may be, to decide such appeal, if made in such form and manner, and with such notices, as are required by the Petty Sessions Acts respectively hereinbefore mentioned as to appeals against orders made by justices at petty sessions; and all the provisions of the said Petty Sessions Acts respectively as to making appeals and as to executing the orders made on appeal, or the original orders where the appeals shall not be duly prosecuted, shall also apply to any appeal or like order to be made under the provisions of this Act.

16. The expense of executing this Act shall be borne, in the city of London and the liberties thereof, out of the consolidated rates raised by the commissioners of sewers of the city of London and the liberties thereof, and in the rest of the metropolis out of any rates or funds applicable to the purposes of the Act for the better local management of the metropolis, and in counties out of the county rate, and in boroughs out of the borough fund, or out of the rogue money in counties in Scotland.

17. Nothing in this Act contained shall be held to affect the power of proceeding by indictment, or to take away any other remedy against any offender under this Act.

18. In the construction of this Act the words "articles of food or drink" shall (if not inconsistent with the context or subject matter) include not only all alimentary substances, whether solids or liquids, but also all eatables or drinkables whatsoever not being medical drugs or articles usually taken or sold as medicines, but this Act shall not be construed so as to affect the ordinary reduction of the strength of foreign, British, or colonial spirits by persons licensed and paying duties under the excise.

BOOKS RECEIVED.

The Pocket Guide to the British Pharmacopœia; being an Explanatory Classification of its Drugs, Preparations, and Compounds; all essentials being comprised in a form and size adapted to the Practitioner's note-book. London: Robert Hardwicke, 192, Piccadilly. 1869.

Remarks on Etherized Cod-Liver Oil. By Balthazar W. Foster, M.D., etc. London: M'Gowan and Danks, Steam Printers. 1869. (Reprinted from the 'Medical Press and Circular').

Lessons in Elementary Chemistry, Inorganic and Organic. By Henry E. Roscoe, B.A., F.R.S., etc. New Edition. London: Macmillan and Co. 1869. (From the publishers.)

Chemical Labels, according to the latest System of Nomenclature. Compiled by Henry Mathews, F.C.S., and C. W. Quin. Published by H. K. Lewis, 136, Gower Street. (From the compilers.)

The State of the Medical Profession in Great Britain and Ireland. By William Dale, M.D., etc. Dublin: Fannin and Co. London: Longmans. 1869.

CORRESPONDENCE.

Persons having seceded from the Society may be restored to their former status on payment of arrears of subscription and the registration fee of the current year.

Those who were Associates before the 1st of July, 1842, are privileged (as Founders of the Society) to become Members, and by virtue of membership to be registered as *Pharmaceutical Chemists*.

The Secretary and Registrar desires to intimate that no anonymous communications, or letters signed with initials only, will be answered.

Pharmaceutical Ethics.—To the Editors of the Pharmaceutical Journal.—Gentlemen,—If you can find space for the insertion of this letter, I will redeem my promise of last

month, and supplement the opinions then advanced on the "Apprenticeship Question." Before doing so, however, I would express the hope that the typographical error of Sunday for sundry in my former communication, has not misled any of your readers as to the drift of my argument. In discussing this most important and vital question of apprenticeship, we have to guard against confounding things that essentially differ,—differing widely both as to cause and effect. An impression exists, and is somewhat widely diffused amongst us as a body, that fewer youths are now being trained as chemists and druggists than formerly. I confess to have shared that impression; correspondence, however, with several well-informed men in different parts of the kingdom, conducted during the past month, with the express design of collecting data, has led me to the conclusion that the impression is incorrect. At the same time I am startled to find the number of young men who, having partly or entirely completed the term of their apprenticeship, quit the business for other avocations. Now, if so much grist goes to the mill and so little flour is the outcome, or, changing the metaphor, if so many recruits enlist and so few effectives is the result, what is the cause, or what are the causes? for that there is just now an inadequate supply of competent assistants is, I believe, a generally-admitted fact. The causes are various, some remediable, others not so. Long hours, close confinement, and the demand for intellectual exertion requisite to prepare for examination, detach numbers of young men. The well-meant but, I fear, mistaken zeal of an eclectic school amongst us who speak lightly of mere trade, and would exclusively cultivate the professional instinct, fosters a pseudo-gentility in our young men, which, when it comes in contact with the stern realities of life, succumbs. On this subject, as on many others, the great body of Chemists throughout the country rarely expresses its verdict. Busily engaged,—too much so, indeed, for controversy,—they allow judgment to go by default; whilst, on the other hand, the eclectic school, compact, educated, and with the advantage of possessing a definite conception of what, according to their ideal, pharmaceutists should be, has pressed forward that conception with an energy and ability that cannot be disputed. I am content, however, to wait for that healthy reaction which, sooner or later, must set in; and in making this statement I do not refer to educational status. That the demand for higher culture exists, is bound to exist, and should be encouraged by every thoughtful man, may be inferred, not only from our own experience and observation, but also from the analogies to be drawn from every department of public life. What the coming generation of pharmaceutists need to be reminded of is, that there is no necessary divorcement between work and science, thorough culture and attention to petty detail. These remarks, although a seeming, are not a real digression from my theme; their bearing on the question of apprenticeship is evident. In arguing the points, we will assume there are two kinds of establishments in which it is desirable our youth should be trained as pharmaceutists. First, the select dispensing houses, whom I ventured to designate in my former communication as our patrician order,—the few whose reputation is wide-spread. Secondly, the large, substantial, influential body of men conducting businesses of great respectability, though of a mixed character. A third class of incompetents I would remit to the limbo of obscurity to which they properly belong. And yet it is a fact, that for the consideration of the premium involved in the transaction, these are too often the men who contract to educate our youth. However, in viewing this matter, we may exclude them from our consideration. In regard to the first of the two classes above-mentioned, the suggestion of Mr. Giles, as to re-modelling the conditions of apprenticeship, would be of great importance. The proprietors of such establishments, in most instances, reside in private houses entirely disconnected from the business; indoor pupils, in such cases, are inconvenient and undesirable. Hence the specific difficulty. Many a man, desirous of placing his son in such an establishment, is not content to do so, if there be no guaranteed supervision of his career during his term of apprenticeship. It is not asking too much, that this watchful care be exercised; but if it be, then must our first-class pharmacies be closed as our training schools. This fact, whilst affording ground for sincere regret, need not cause despair. If only the influential body of provincial Chemists constituting my second classification, will consent to receive and train our youth, we may well be content. I entertain not the shadow of a doubt, that the curriculum of such houses, for all practical purposes in the after experience of life, constitutes the very best discipline. If such men decline the task, we may well cherish apprehension. I cannot speak with confi-

dence, not having sufficient evidence before me on which to build an opinion, but, at least, I have a misgiving that such men are more and more declining to take apprentices. I shall be glad to elicit an expression generally from the trade on this point. If such a state of things were to grow, the reflex action on ourselves must needs be unhappy; from whence are we to derive our assistants? I will briefly recapitulate the arguments I have advanced:—(*a*) Residence in the house of business desirable, but if not practicable, the employer still to be regarded as responsible for the moral training of his apprentices. (*b*) The term of apprenticeship may be advantageously shortened. (*c*) Healthier notions in regard to work need to be inculcated. And further, as a matter which I have purposely eliminated from discussion, we need some fresh interpretation of the law as to our liability in courts of law for errors committed by our *employés*, both assistants and apprentices. I hasten to close this letter by remarking, that the question of apprenticeship has been for some time past quietly drifting in the wrong direction, and yet it is one of such primary importance, as to deserve the wise and thoughtful consideration of the best men amongst us.—I am, faithfully yours, S. R. Atkins, *Salisbury*, *April* 12, 1869.

"*Trochisci Opii, P.B.*"—To the Editor of the Pharmaceutical Journal,—Sir, I think it desirable to call the attention of medical men and chemists generally to an error commonly prevailing among manufacturers of lozenges in reference to the opium lozenges of the Pharmacopœia. Every sample that I have met with has stamped upon it, "Opium Lozenge, $\frac{1}{10}$ grain," and as the Pharmacopœia directs that they should contain $\frac{1}{10}$ gr. *Ext. Opii*, just double the strength, the matter becomes serious. I do not know whether they carry it so far as to make them with opium instead of the extract, but in any case the misnomer should be corrected The error is not common to lozenge makers alone, for I find it repeated in one of the best of our materia medica text-books, and one specially recommended by the Pharmaceutical Society to students. I am, Sir, your obedient servant, Archbell James Nutt, 47, *Piccadilly*, *April* 10*th*, 1869.

Council, not Privy Council.—To the Editor of the Pharmaceutical Journal.—Sir,—Every year as we come round to the time for electing the Council of the Pharmaceutical Society, I feel strongly—and I may say every year more strongly—the need there is of some better means of judging the relative merits of the various candidates. And now I would again urge the sheer impossibility of doing justice either to those who are in office, or those who are willing to devote themselves to the work of the Society, without better means of knowing what is the part taken by the various gentlemen who are from time to time elected to represent us. Country members as a rule have little means of judging of their London brethren, except such of them as make known their views and their abilities by contributions to the Journal, or addresses at the Society's meetings; and for this, as far as it relates to those who are not in office, I am not prepared to propose any remedy; but when once elected to the Council, it becomes a right of those who elected them to know how they fulfil the duties of their office. Nothing can be more constitutional, more just, or more politic than that the subjects brought before the Council should be published, together with the support or opposition given to them by the various members present; and nothing can be more objectionable than exposing worthy representatives to non-re-election by concealing their utility and allowing their names to go almost unknown among the constituency, while others, it may be, are elected who have little to recommend them but the familiarity of their names, and *that* perhaps gained by the association with a quack medicine or a "druggist's sundry." I trust that the suggestion of Mr. Reynolds upon this subject in your last number will meet with favourable consideration.—Barnard S. Proctor, 11, *Grey Street*, *Newcastle*, *April* 21, 1869.

The Lecture Hour.—To the Editor of the Pharmaceutical Journal.—Sir,—Will you allow me, through your columns, to call the attention of the Council of the Society to the very inconvenient hour for the chemical and botanical lectures? Half-past eight may be very convenient for those students who live in the immediate neighbourhood of Bloomsbury, but for those who reside in the suburbs, it simply means exclusion from the lectures. Take my case:—I live fifteen miles from London,—the earliest time I can possibly get to Bloomsbury Square is nine o'clock; I must now either go up to town

overnight, and sleep in London, or lose the advantage of the lectures; neither of which alternatives appear to me very desirable. And mine is not a solitary case; there are many students within a short distance of London who would gladly avail themselves of the lectures, if they were not precluded from doing so by the unseasonable hour at which they are delivered. So long as the Pharmaceutical Society was a voluntary association with a comparatively limited influence, this might have been of little consequence; but now, it has become such a powerful and important institution, affecting the interests of such a large number of men, it is a very serious matter. In October next, another session will commence, and I venture to hope that before that time the Council will take into their serious consideration the desirability of having the lectures somewhat later, say nine o'clock or half-past nine. Believing that this suggestion will meet the approval of many, if not all, interested in the matter,—I am, Sir, your obedient servant, W. H. HARSANT, *Epsom.*

Proceedings of the Council.—To the Editors of the Pharmaceutical Journal.—Gentlemen,—Now that the Council of the Pharmaceutical Society has been endowed with quasi-parliamentary power, the suggestion contained in Mr. Reynolds's letter in the last Journal, *that the proceedings of the Council should be reported*, is one of very great importance to the provincial members, the great body of whom are not disposed to submit to any more Legislative interference. There exists throughout the trade a considerable amount of dissatisfaction, and, whether well or ill founded, those who feel aggrieved have a right to be heard, and to know what may be in store for them in the future. This may probably not be agreeable to some members of the Council, but such a consideration must not be allowed to overrule the more weighty consideration of the interests of the whole provincial trade. This subject, and the kindred one of representation, I trust will receive the earnest attention they merit. The importance of both will increase, the more they are examined. As elections for members of the Council are at present conducted I consider them a nullity. The same names are submitted year after year, and few people have taken any interest in them, and those who have taken the trouble to vote have generally done so with but slight acquaintance with the candidates. No candidate stands the slightest chance of election unless he has a reputation of some kind that renders his name familiar to the whole trade. This state of things ought no longer to continue; there must be some organization, by which proper candidates may be selected, and their election ensured, so that provincial interests are fairly represented in the Council.—Yours respectfully, F. M. RIMMINGTON, *Bradford.—April 20th*, 1869.

Ants.—To the Editors of the Pharmaceutical Journal.—Gentlemen,—One of your correspondents (Atherstone) in the Journal for this month inquires how ants that infest houses can be destroyed. This is a sanitary subject, *not pharmaceutical.* No doubt ants may become intolerable, especially where there are children, but we should not lose sight of their use in the economy of nature in the scavenger line. If it were possible for a colony of ants to thrive in certain parts of London, I am sure they would help to destroy that disgusting insect the bug. Ants help to destroy house-flies, etc. When ants are so numerous as to become a nuisance, they can be destroyed by boiling water; but I see them at my door every summer, and the only interference they meet with is the broom or brush when the doorway is swept. I have lived in the tropics, and I know how to value the ant.

"For where the greater malady is fixed,
The lesser is scarce felt."

—I am, gentlemen, your obedient servant, JOSEPH LEAY, *Chilcompton, Bath.—April 16th*, 1869.

"*A Constant Reader*" (Dudley).—Any elementary work on the subject would answer the purpose.

A. P. (Longton).—Those only who are on the register as Pharmaceutical Chemists are exempt from service on juries.

"*An Anxious Examined Member*" (Liverpool).—(1.) In such a case it would be desirable to communicate with the physician. (2.) Yes; by the reducing action of the carbolic acid.

F. W. (Brighton) is thanked for his communication. The evidence in the case referred to is insufficient on which to form an opinion. The particles, if really crystalline, as described, would point to oxalic acid rather than oxide of zinc.

Mr. T. J. Monaghan is thanked for his communication.

"*Enquirer*" (Farnham).—The plant is *Ranunculus Auricomus*.

Mr. Gethen (Hereford).—The communication would more suitably appear as an advertisement.

"*Syphax*."—Any elementary work on arithmetic.

Q. S. O.—Referring to a passage in a letter on Pharmaceutical Ethics in our last number, thinks the reflection cannot apply to those medical men who are legitimately apothecaries as well as surgeons. (1) *Syrupus Ferri Phosph. Co.*, see Vol. XVIII. p. 579. (2) We do not know the composition of *Schweitzer's Dietetic Salt*. (3) We know of no better means than the use of a few grains of bicarbonate of soda. (4) No. (5) Mr. Van Abbott. (6) No. (7) By the use of any weak alkaline solution after taking each dose of the medicine.

E. C. should inquire of Messrs. Maclachlan, Stewart, and Co., Edinburgh.

"*Nemo*" (Sudbury) wishes to know the reason "why *Syrupus Ferri Phosph.* B.P., turns slightly pink when kept for a few weeks, and whether it is possible to remove the colour by heat or any other means."

"*A Constant Reader*" is recommended to attend some evening class.

A. E. J. (Norwich).—The reply to the question first put was previous to the passing of the Bye-laws in conformity to the Pharmacy Act, 1868.

Mr. Gissing (Wakefield).—Jacob Bell was born March 5, 1810, in Oxford Street, in the parish of St. James, Westminster. See 'Sketch of the Life of Jacob Bell,' Vol. I. (N. S.) p. 153.

Mr. L. L. Woodward, in reply to two questions in our last number, sends the following:—"*S.*" (Bedford).—"*Oxymel Scillæ* can be made bright by adopting the process of the B. P. 1867, for *Mel Despumat.*, viz. filtering through flannel."

"*Atherstone*."—"*Newly* powdered Jalap, used liberally, proves very destructive to ants."

Mr. John Bailey (Manchester).—We beg to acknowledge the receipt of Illustrated Catalogue; without knowing the value of the invention we could not insert the description referred to.

"*Student*" (Norwich).—(1) At present no extra fee is demanded. (2) Yes. (3) Not for the "Minor." (4) Ten days' notice is required.

"*An Assistant*" (Turriff).—Probably tannate of quinine.

M. E. F. (Bishopsgate) and *F. E. M.*—*Marking Ink.* Vol. VII. p. 183.

G. E. R.—The diagnosis of the more important indigenous plants used in medicine is alone necessary.

"*Botanicus*."—Ready in May.

B. R. (Manchester) wishes for "a formula for Liq. Copaibæ Co. composed of copaiba, cubebs, and buchu, that will be quite soluble in water."

A. P. S. (1) The sample sent is of average purity. (2) We know of no better process than that described in this Journal, Vol. IX. (N.S.) p. 496.

A. N. (Penzance).—The change is probably due to the formation of a suboxide.

A. Z. wishes to know where to find "Marsh's" test for purifying water. Is *Clark's* test intended? If so, it will be found in the first volume of this Journal.

Instructions from Members and Associates respecting the transmission of the Journal before the 25th of the month, to ELIAS BREMRIDGE, Secretary, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Messrs. CHURCHILL, New Burlington Street. Other communications to the Editors, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. X.—No. XII.—JUNE, 1869.

THE NEW ERA IN PHARMACY.

Several events, of more than ordinary interest to our readers, have occurred in the past month. The anniversary meeting of the Pharmaceutical Society, and the Conversazione which preceded it, were held as usual, and were more than usually well attended. This may perhaps be ascribed to the altered circumstances under which they took place on this the first occasion on which the members of the Society have been thus called together since the passing of the Act of last year. Not only has the Society been considerably enlarged by the accession of members in accordance with the original constitution, but new elements have been introduced under the provisions of the Pharmacy Act of 1868, and new powers have also been conferred upon it. The proceedings of the Anniversary Meeting, the first of a new era, were looked forward to with much interest, as also was the result of the election of the new Council. It is very gratifying to find that although a larger number of members met to discuss the affairs of the Society than has perhaps ever met on a similar occasion before, yet perfect harmony prevailed, and all seemed to be satisfied with the way in which the proceedings passed off. The confidence of the enlarged constituency in those who have for many years conducted the affairs of the Society, may be inferred from the fact that only one new member has been introduced into the Council for the ensuing year, notwithstanding the desire expressed to infuse new blood. It will be observed that the number of votes recorded was considerably greater than usual.

The resolution which was passed, to the effect, "That, as a result of the Pharmacy Act of 1868, it is desirable that the minutes and votes of future meetings of the Council be published monthly," affords some evidence of the popular element which the new Act has ingrafted in the constitution of the Society.

After the Anniversary Meeting, the presentation of the testimonial to the President, Mr. Sandford, in acknowledgment of his great exertions, and valuable services, in the interests of pharmacy, and especially in promoting the passing of the Pharmacy Act of last year, contributed to increase the enthusiasm and good feeling manifested by the company who crowded the rooms in Bloomsbury Square throughout the morning and afternoon of Wednesday, the 19th of May, and afterwards adjourned to the Freemasons' Tavern, in Great Queen Street, where an excellent dinner was given in commemoration of the auspicious events of the day.

PHARMACY ACT AMENDMENT BILL.

This Bill, the purport of which, in the form in which it was introduced by Lord Robert Montagu, was explained in our number for April, and which we noticed last month as having been read a second time without alteration or remark, has received some additions in committee, and, having now passed the third reading in the House of Commons, it has been sent to the House of Lords, but it has not yet been printed with the alterations that have been made in it. As we have stated on a former occasion, the object of the Bill is to reserve the rights of medical practitioners and veterinary surgeons to dispense medicines to their patients, some doubts having arisen with reference to the operation of the Act of 1868 in some special cases. The clause, as it now stands in the Bill for meeting these cases, is as follows :—

"Nothing contained in the first fifteen sections of the recited Act shall affect any person who has been registered as a legally qualified medical practitioner before the passing of this Act; and the said clauses shall not apply to any person who may hereafter be registered as a legally qualified practitioner, and who, in order to obtain his diploma for such registration, shall have passed an examination in pharmacy; nor shall the said clauses prevent any person who is a member of the Royal College of Veterinary Surgeons of Great Britain, or holds a certificate in veterinary surgery from the Highland and Agricultural Society of Scotland, from dispensing medicines for animals under his care."

A clause has been introduced which, we believe, will be acceptable to assistants of three years' standing, who have desired to be admitted to the Modified Examination, but have been excluded by the provision that the three years' service must have been *immediately* before the passing of the Act. This condition is removed by the clause in question, which provides that the engagement as a dispensing assistant to a chemist and druggist may have been at any time prior to the passing of the Act of 1868. The period during which application may be made to be admitted to the Modified Examination is, at the same time, extended to the end of the present year.

It is possible that some further modifications may be made in the Bill before it passes, and, although tinkering in such cases is rather hazardous work, it may reasonably be anticipated that this attempt to amend the Pharmacy Act of 1868 will not be unattended with a satisfactory result.

THE LAW RELATING TO THE SAFE KEEPING OF PETROLEUM.

The Government have justified their promise to provide a remedy for the hardships complained of in connection with the keeping of petroleum under the regulations imposed by the Act of last Session. A Bill has been introduced and read a first time, which repeals the Acts of 1862 and 1868, for the safe keeping of petroleum, and re-enacts all the important provisions of those Acts, with certain exceptions, which are intended to meet the complaint alluded to.

The principal complaint had reference to the sale of benzole or "Benzine Collas," for this liquid being included under the definition of the term "petroleum" as given in the Act of 1868, those who sold it were obliged to obtain licences for doing so, and those licences often imposed regulations which were quite unnecessary and very troublesome and objectionable, as applied to the keeping and sale of such an article.

The important section in the Bill now introduced, as affecting Chemists and Druggists, is the following:—

"4. Save as hereinafter mentioned, after *the passing of this Act*, petroleum shall not be kept within fifty yards of a dwelling-house or of a building in which goods are stored, except in pursuance of a licence given by such local authority as is in this Act mentioned.

"Any petroleum kept in contravention of this section shall be forfeited, and in addition thereto the occupier of the place in which such petroleum is kept shall be liable to a penalty not exceeding *twenty pounds* a day for each day during which petroleum is kept in contravention of this Act.

"This section shall not apply to petroleum kept for private use, nor shall it apply to petroleum kept by a dealer for sale by retail, provided the following conditions are complied with:—

"1. That it is kept in separate glass or earthenware bottles, each of which contains not more than half a pint, and is securely corked:

"2. That the aggregate amount kept by the dealers, supposing the whole contents of the bottles to be in bulk, does not exceed *three gallons*."

It will still be necessary that benzole or any other liquid coming within the definition of the term "petroleum" as used in the Act, and giving off an inflammable vapour at a temperature of less than 100° F., should, when sold for use within the United Kingdom, have a label attached to it, as follows:—"Great care must be taken in bringing any light near to the contents of this vessel, as they give off an inflammable vapour at a temperature of less than one hundred degrees of Fahrenheit's thermometer."

Wholesale dealers must still obtain licences, and the seventh section states that, "There may be charged in respect of each licence granted in pursuance of this Act such sum, not exceeding *two shillings and sixpence*, as the local authority may think fit to charge."

In other respects than those we have mentioned, the law will be left by this Bill in the same state as it is in at present, but the two Acts previously in force will be consolidated into one.

The Bill stands for second reading on the 10th of June.

THE ADULTERATION OF FOOD AND DRUGS BILL.

This Bill, to which we alluded in our last number, has not since made any progress, but it stands for second reading on the 10th of June, and will require to be watched in its progress through Committee. There is one section in particular that requires modification, and that is the third, which provides for the appointment of *analysts*. There are no men better qualified for this appointment than our better class, educated, pharmaceutists; but we observe that the Bill, in referring to the qualifications of those to be appointed, states that they should possess "competent *medical*, chemical, and microscopical knowledge." The term 'medical' as used here would probably shut out pharmaceutists who have no legal medical qualification from competing for an appointment for which they may be well qualified, and better fitted than if they were medical practitioners. It has been the practice for many years past to confine appointments of this description to medical practitioners, where others having no special medical qualification would be equally eligible, and members of our Society should assert their legitimate claims to a fair share of such appointments.

TRANSACTIONS

OF

THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *May 5th*, 1869,

Present—Messrs. Bottle, Bourdas, Carteighe, Deane, Edwards, Evans, Haselden, Hills, Morson, Orridge, Randall, Sandford, Savage, Squire, Standring, Stoddart, and Williams,

The following Pharmaceutical Chemists were elected

MEMBERS.

Gerrard, Alfred William, London.
Hunt, Charles, London.
Mee, George, London.
Roberts, John Lyddon, Leeds.
Steel, Frank William, London.

The following Chemists and Druggists, registered under the "Pharmacy Act, 1868," were elected

MEMBERS.

TOWN.	CHRISTIAN & SURNAME.
Aldershot	Lloyd, William John.
Basingstoke	Allen, Henry.
Birmingham	Walker, Robert.
Bishop Auckland	Leigh, John James.
Cambridge	Beall, George.
Canterbury	Adams, H. Gardiner.
Chester	Williams, John Eyton.
Chippenham	Westlake, Bernard.
Colchester	Barritt, Henry.
Dolgelly	Williams, R. Wynne.
Durham	Rollin, John George.
Filey	Stathers, Alfred.
Forest Hill	Flood, Wm. Wright.
Hartlepool	Horsley, John.
Leyton	Davis, John Morgan.
Littleborough	Dickinson, J. E. Booth.
Liverpool	Agnew, James.
,,	Billington, Frederic.
,,	Williams, R. Pritchard.
,,	Hocken, Joshua.
Machynlleth	Rees, Edward.
Meltham	Sanderson, Robert.
Middlesborough	Bell, Fred Robinson.
Monmouth	White, Walter.
Northampton	Mayger, Wm. David.
Oswestry	Vaughan, David.
Peterborough	Loveridge, T. Potter.
Preston	Mason, H. Cornwall.
Ripon	Parkin, J. Brooks.
Rochester	Barnaby, Henry.
Ruthin	Lloyd, Robert.
,,	Lloyd, Thomas Henry
St. Austell	Dunn, Sampson.
Stockport	Kay, Samuel.
,,	Kay, Thomas.
Tenby	Walkinton, William Marmaduke.
Tiverton	Havill, Paul.
Wrotham	Peake, Robert.

LONDON.

Clark, John Adolphus, 11, Duncan Place, London Fields, Hackney.
Gill, Charles Kidington, Harrow on the Hill.
Holmes, William Court, 33, Euston Square.
Kenerstone, Francis J., 154, Hoxton Street.
Rogers, James, 26, Church Street, Stoke Newington.
Westrup, Joseph B., 76, Kensington Park Rd.

Resolved—That free Laboratory instruction be given to the Bell Scholars for the Session 1869–70.

MEETING OF THE COUNCIL, *May 19th*, 1869.

Present—Messrs. Bottle, Bourdas, Brady, Carteighe, Deane, Edwards, Evans, Haselden, Hills, Ince, Mackay, Morson, Orridge, Randall, Sandford, Savage, Squire, Standring, Stoddart, and Williams.

The Report of the Council having been read and agreed to, the Council adjourned to the Annual General Meeting.

EXAMINATIONS IN LONDON.

May 7th, 1869.

Present—Messrs. Bird, Carteighe, Cracknell, Darby, Davenport, Deane, Edwards, Gale, Garle, and Haselden.

MODIFIED EXAMINATION.

Fifty-one candidates presented themselves; the following forty-six passed, and were duly registered as

CHEMISTS AND DRUGGISTS.

Banks, Frederiek, London.
Baxter, William, Bradford.
Betts, William Maydwell, Grantham.
Billing, Thomas, London.
Blackburn, Samuel, Neweastle-on-Tyne.
Busby, James, Harpenden.
Chapman, Thomas, Durham.
Coley, Samuel James, Stroud.
Crawford, Sharman, Southampton.
Drury, Robert, Lincoln.
Findlay, James, London.
Firman, Henry Elliston, Hanley.
Foster, Henry, Manehester.
Gabites, William, Liverpool.
Gibb, William Duirs, Winehester.
Goodwin, Medmer, Torquay.
Greening, William, Bristol.
Hannah, John, Liverpool.
Heaford, William Thomas, London.
Herbert, William, Southwark.
Ibbotson, Frederick, Wakefield.
Keall, Franeis, Canterbury.
Kitson, Samuel, London.
Lawson, William Thomas, Birmingham.
Lowe, Alfred, Chesterfield.
Lutwyehe, Henry John, London.
Marsh, George William Frederiek, Swansea.
Morris, Griffith Evans, Dover.
Nuttall, Robert Holroyd, Searborough.
Odell, George William, London.
Osmond, George Mattingly, Bristol.
Payne, John Buxton, Liverpool.
Philp, Joseph, Wadebridge.
Piekles, Luke, London.
Pogson, Thomas Frederiek, Newark.
Rae, John, Newmarket.
Rees, Joseph, Eglwyswrw.
Royse, Alfred, Manehester.
Ryman, William, London.
Sanders, William Fletcher, Plymouth.
Smith, William Baekwell, Goole.
Thornton, John, London.
Tomsett, George Thomas, Brighton.
Wilkinson, William, Blandford.
Wright, Arthur, Lowestoft.
Younger, Robert Edward, Northampton.

May 12th, 1869.

Present—Messrs. Bird, Carteighe, Craeknell, Darby, Davenport, Deane, Edwards, Gale, Garle, and Haselden.

Twenty-three candidates presented themselves for the Major and Minor Examinations; the following nineteen passed, and were duly registered:—

MAJOR (as Pharmaceutical Chemist).

*Histed, Edward . . . . . Tonbridge.

MINOR (as Chemists and Druggists).

Atkinson, William Charles, London.
†Bilney, Joseph Thomas, London.
†Bland, Thomas Fredrick, Stourbridge.
Bright, William Henry, Bath.
Butler, Charles, Liverpool.
†Butterworth, Henry, Roehdale.
Campbell, Alfred, Honnslow.
Christmas, William, Alton.
Griffiths, Edward Shindler, London.
Hairsine, Herbert Seaton, Hull.
†Jelley, Richard, Elton.
Neame, Austin John, Hampstead.
Smith, Joseph Wheeler, Birmingham.
Stanley, Herbert, Stoekport.
†Ward, John Slinger, Stoekton-on-Tees.
Warman, William Albert, Canterbury.
†Warrior, Charles, Northallerton.
Whitby, John, Stratford-on-Avon.

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* Passed in honours; eligible to compete for the Pereira Medal.
† Passed in honours; eligible to compete for the Prize of Books.

REGISTERED APPRENTICES AND STUDENTS.

NAME.	ADDRESS.	
Adams, Richard	Mr. King	Market Drayton.
Ball, George	Mr. Garside	Ormskirk.
Barratt, William	Mr. Langford	King's Lynn.
Baynes, James, jun.	Messrs. Harrison and Co.	Sheffield.
Best, Thomas Fütcher	Mr. Quarrington	Bath.
Bourne, C. Matthew Kemsey	Messrs. Fleeming	Wolverhampton.
Brewster, William	Mr. Bull	Royston.
Broad, John Morris	Mr. Broad	London.
Cartwright, William Adam	Mr. Brunt	Hyde.
Chapman, Joseph John	Messrs. Boyce and Son	Chertsey.
Cocker, D.	Mr. Gill	Pendleton.
Connor, Thomas Haigh	Mr. Johnson	Barnsley.
Crawshaw, James H.	Mr. Crawshaw	Sheffield.
Cripps, Ernest Henry	Mr. Cripps	Devizes.
Darwin, George Henry	Mr. Outwin	Rotherham.
Ditchburn, Luke	Workhouse Infirmary	Birmingham.
Evans, Lemuel David	Mr. Moore	Pembroke Dock.
Evans, William	Mr. Harris	Swansea.
Ford, Horace Sidney	Mr. Sapp	Southsea.
Francis, William Henry	Mr. Gostling	Diss.
Gill, Joseph William	Mr. Gill	Pendleton.
Gresswell, Arthur	Mr. Swift	Spalding.
Guy, Frederick	Mr. Simpson	Louth.
Hill, William	Mr. Simpson	Louth.
Hucklebridge, James M., jun.	Mr. Hucklebridge	London.
Jones, David	Mr. Jones	Rhyl.
Jones, Owen	Mr. Hughes	Llangefni.
Moon, Henry	Mr. Nasbet	Sunderland.
Morgan, John	Messrs. Kiddy and Ashton	Belper.
Orman, Henry	Messrs. Scale	Landport.
Parkhouse, Mark		Folkestone.
Pitts, Phineas Reynolds		Hingham.
Pollard, William	Mr. Ramskill	Leeds.
Powell, Thomas Henry		
Price, Ebenezer Edmond	Mr. Weir	Merthyr.
Rimmington, Felix W. Elgey	Mr. Rimmington	Bradford.
Roberts, Joseph Elliott	Mr. Brown	Leeds.
Smith, John Francis	Messrs. Coulson and Wells	Scarborough.
Stebbing, Frederic Charles	Mr. Gardiner	Norwich.
Strawson, George	Mr. Simpson	Louth.
Street, John William	Mr. Peach	Melton Mowbray.
Stubbs, Tyson	Messrs. Plomley and Waters	Rye.
Tansley, Arthur James	Mr. Mackenzie	Cheadle.
Taylor, George William	Mr. Simpson	Louth.
Walker, Charles William	Mr. Chaundy	Oxford.

EXAMINATION IN EDINBURGH,

May 13th, 1869.

Present—Messrs. Ainslie, Aitken, Brown, Buchanan, Kemp, Mackay, and Young.

Six Candidates presented themselves for examination; the following four passed, and were duly registered—

MINOR (as Chemists and Druggists).

Brown, John, Newcastle-on-Tyne.
Ellwood, Michael John, Newcastle-on-Tyne.
*Linton, Ralph Tait, Edinburgh.
*M'Vea, Anthony, Glasgow.

REGISTERED APPRENTICE.

Riddle, William Routledge, Hexham.

MODIFIED EXAMINATION.

The following seven candidates passed, and were duly registered as

CHEMISTS AND DRUGGISTS.

Adam, Thomas, Edinburgh.
Beatt, David, Montrose.
Hales, Thomas Meredith, Warrington.
Hutton, Thomas, Linlithgow.
Ritson, James Chapman, Newcastle-on-Tyne.
Simpson, John, Glasgow.
Swift, Charles Henry, Rochdale.

PHARMACEUTICAL MEETING.

Wednesday, May 5th, 1869.

MR. H. SUGDEN EVANS, VICE-PRESIDENT, IN THE CHAIR.

DONATIONS TO THE LIBRARY AND MUSEUM

were announced as follows, and the thanks of the Meeting given to the respective donors:—

Le Règne Animal, par Cuvier, 4 vols., 1817: from Mr. W. Ashton. Report of Patients treated in St. Thomas's Hospital from 1861 to 1865: from the Hospital. Proceedings of the American Pharmaceutical Association for 1868: from the Association. Companion to the Pharmacopœia, 7th edition: from Mr. Squire. A specimen of camphor oil from Formosa: from Messrs. Hodgkinson, King, and Co. Specimens of jalap grown in an open border in King's College Botanic Garden, Dublin, in 1868, to illustrate the paper read before this Society by Dr. Smith: presented by Prof. A. Smith. A set of brass metric decimal weights, as used in the pharmacies of France and other countries; a set of iron metric weights, as used by grocers; a draper's metre measure; a specimen of the jointed metre measures used by carpenters; a 10-metre measuring tape; a set of metric pewter measures, from the double litre to the centilitre; a set of wooden metric measures for seeds, etc., from a decalitre to a decilitre: medicine bottles for holding metric decimal quantities; several French prescriptions, illustrating the use of metric decimal weights; sets of the copper decimal coins of France and Italy. (The figures on them represent their value in centimes and their weight in grammes. Their diameter and thickness of edge are parts of a metre): presented by Prof. Attfield. Model of a cubic decimetre; a wood metre and yard for educational purposes; questions on the school metre; an American coin, 5 cents in value, 5 grammes in weight, 2 centimetres in diameter, 1 millimetre thick: Presented by J. Yates, Esq., F.R.S.

METRICAL WEIGHTS AND MEASURES.

The adjourned debate on Dr. Redwood's paper, which was read at the preceding meeting, on the above subject, was opened by

Mr. CARTEIGHE, who said that he did not agree with Prof. Redwood in his notion of bending, in some measure, the French system so as to suit ours. The great objection to the bending of any system was that, when once the real bend was introduced, it was impossible for the student to be aware, when he learnt the nature of that bend, of the origin of it, and of the peculiar circumstances under which it was brought about. His fear was that if such a proposal were carried out, the tetram, which would be four grams, and which would repre-

* Passed in honours; eligible to compete for the Prize of Books.

sent a drachm very nearly, might or might not be divided according to the decimal system; or it might, at the option or convenience of the person about to use it, be divided into halves or quarters. This, of course, applied more especially to the octram and libram, and not so much to the tetram. But the fundamental objection he had to it was, that it was based on eight as the multiple. If they were to have the decimal system, he should object strongly to eights. There were many well-informed men, of practical ability and scientific skill, who had laboured to show that they were wrong in adopting the decimal system at all,—that the most natural system was one of which 8 was the integer. That, however, was not the question for them to consider. The decimal system was largely used abroad, and was coming so much into use here that they would be compelled to follow in the wake of other nations. They must, therefore, discard the notion that the decimal system was anything but the best, and, for the purpose of the discussion that evening, assume that it was the best. The other objection which he had, which was a more important one, was that he did not think it would be more easy to remember that a tetram was four grams than it would be to remember that four grams were equivalent to the old drachm. There was some advantage, to be sure, in units; and, if this was a question for the public, he should be disposed to concur with Prof. Redwood, that he had an excellent precedent in the French case; but the French were wanting to carry this system throughout the country, and it was necessary, therefore, that they should adopt processes for conveying this system, in some way or other, to the intuitive mind. Now, it seemed to him that this was not their object. The public would ultimately learn something of the decimal system through any class which chose to use it; and he did not think that pharmacists should go out of their way, and spoil what was naturally a good system by doing that to it which was really not necessary for educated people. It would be as easy in practice to take a definite number, say four; and in writing it did not take up more space, and did not require any greater exertion of the mind to use that than it did to use the tetram. His opinion, as regarded the introduction of these weights and measures, was that, rather than adopt any such plan as that suggested by the Professor, they should wait a longer period, and educate themselves in the system by getting practically acquainted with it. Now, to do this it was quite clear there must be a certain amount of education on both sides. The medical practitioners must learn how to use and prescribe under this system; and they, the pharmacists, must learn how to compound, manufacture, and dispense. As regarded the first part, it seemed to him very important that, if it met with the concurrence of the Council of this Society, they should make some suggestion or recommendation to the General Medical Council on this point. He was not quite sure, as he had not had an opportunity of searching, but he believed it was a fact that in none of the universities, and in none of the examining bodies granting degrees in medicine, was there any test bearing upon this system. In the case of the medical profession, it seemed to him that the best time for getting some acquaintance with it, or rather for exacting acquaintance with it, would be at the preliminary examination. He thought it would not be too much to expect that a medical student, after a given time, should know at all events the principle of the metrical system. If he did that, he would have little difficulty, as he got further on in his career, whether as a pharmacist or as a member of the medical profession, to complete the change from one system to the other. That is more important, because he fancied that most of his brethren who had had anything to do with medical men, who had ever had to suggest a mode of carrying out a problem partly chemical and partly physiological, would bear him out in saying that very few indeed had any knowledge of this system; and it was in working out such problems especially that, as every one knew, the advantages of it were so great. That their own

students should have a theoretical knowledge of it was a necessity. He had not much to say about that, because the Board of Examiners were sufficiently alive to the merits of this system, and to the necessity, since its introduction into the British Pharmacopœia, of insisting, not only upon a theoretical, but also a practical acquaintance with it. The Board had had the power, under their rules, for a considerable time, of examining in this subject; but they had not hitherto exercised it. Under the new state of things it was very incumbent upon the Board to see that every candidate knew the principles of the metrical system, and had some practical knowledge of it. There was one point which students ought to remember, especially those who came up for the Major. In the part of the Pharmacopœia which related to the subject of volumetrical analysis, provision was made for conducting the processes either according to the English or the French decimal system; and the Examiners would be better satisfied with a candidate skilled in volumetrical analysis, if he performed that analysis by means of the new system than if he performed it by means of the old. The next point was how to acquaint a large number of pharmacists who had not had an opportunity of seeing these weights and measures with the actual volumes, so as to know what a gram meant,—to be able to identify in one's mind what was a gram, a centimeter, or a liter, just as they knew what a grain was of almost anything they dispensed. No better plan had suggested itself to his mind than that this Society should, where necessary, assist provincial societies in procuring complete sets of these French measures, so that they might have them in their museums or in some places easy of access, that any one in an idle half-hour might go in and make himself practically acquainted with them. He would provide a number of sets of these measures, and put them in such places in country or town that every one could become practically acquainted with their relative values. The real, practical part of the matter they had still to consider, and there they met with considerable difficulty. That, however, must be grappled with fairly and honestly. They must be prepared to incur greater responsibility in prescribing and dispensing, because really that was what it came to. He knew that many pharmacists objected very much to this system in the abstract, because it would increase their responsibilities; but he thought that, as Dr. Redwood had pointed out, they had no alternative; and although he, for one, hoped the system might be speedily introduced, still he was aware that there were many practical difficulties in the way. He was quite unable to suggest any process of bending, or any compromise between the two systems which would suit alike prescriber and dispenser, chiefly upon the ground first mentioned—that the decimal system being one of ten, and theirs one of eight, they might do what they would but they would not find any nice relation; and he suspected Prof. Redwood found out the best relation in his search after the tetram. It had been suggested by Prof. Attfield, and by others, that it would be a good plan to publish the Pharmacopœia with both systems. That would be a practical introduction of the system. Now, Prof. Redwood objected to that, and he (Mr. Carteighe) confessed there was one very strong reason against it, and that was that all pharmacists would necessarily have a mixed system. In the case of weights and measures the responsibility would lie in this way, that, supposing any mishap to occur, or any preparation not to be made correctly, there would be a disposition to censure the compilers of the Pharmacopœia for what, after all, might be the stupidity of individuals. They could not, as a rule, get public bodies of men to take upon themselves such a responsibility; and therefore he was inclined to think that that alone would be sufficient reason why the two systems should not be introduced, at all events side by side, in the Pharmacopœia. But it had occurred to him whether they could not have something of the same kind in a different way. For instance, there was such a thing as having a supplement or a companion to the Pharmacopœia.

It seemed to him that a book partaking of that character could be compiled and made to sell; and even if it did not pay he should not attach much importance to that, for it might be circulated at the cost of any society that was willing to pay the necessary expenses. Such a book might be compiled containing all the formulæ of the B. P., with the weights and measures ranged side by side according to both systems. He thought such a publication would be sought after by a great many people, especially by manufacturing chemists, and by all pharmacists who had much to do with the manufacture of their own preparations. He attached a great deal of importance to the manner in which these measures should be represented. He fancied there was only one way of doing that, and that was the way the French had adopted in their last Pharmacopœia. Most of the members would recollect that they had devoted one chapter to extracts from foreign Pharmacopœias, and in these the weights were given in the ordinary way in their French names, and opposite to them in italics were put the weights of the respective countries. Then, as regarded practitioners, in the practical carrying out of this system, he suspected they would have to suggest some small companion, in the shape of a card or a table representing fairly the equivalents of this system. By these and other similar means, they would, in course of time, introduce a certain knowledge of the system amongst the public, and tend to bring about a spirit of inquiry which would probably result in a general adoption of the whole French system; but it would be hopeless to expect that this could be done in a short time. It was well known that in many parts of France still the old weights were used. Any one who went into the markets of France on a market day would hear the old weights going, and some of them were quite as primitive as our three barleycorns to an inch, and all the rest of it. What they wanted was a system applicable to men of business and education, which would be easy of comprehension, whether it be in this country, America, in Russia, or in France.

Professor Redwood said it might conduce to the discussion of this subject if he read a letter which had come into his hands that morning, which brought a new feature into the discussion. It had been sent to the editors of the Pharmaceutical Journal by Mr. Thomas Lowe, of Liverpool, and it was to the following purport:—

Gentlemen,—While admitting the great superiority of the decimal system of weights and measures in use on the Continent, over the no-system we have here, I feel yet as certain of its ultimate abandonment as any advocate of that system can be of its previous successful establishment. This, like the latter, is merely a question of time.

It is not that I am opposed to a rotary, or revolving, principle in enumeration. That would be to retrograde into barbarism. The inventor of our present numeral scale, like the inventor of the steam-engine, of the printing-press, and the discoverer of gravitation, was, doubtless, one of those rarely-endowed intellects to which the gratitude of the world is due; but why are we to take it for granted that in figures only perfection has been attained at once? Has it been so in any other instance? Is it likely that a scheme of enumeration, to the particular form of which the accident of the inventor's using his finger-ends in order to illustrate it, most probably gave rise, should be incapable of improvement? Surely not. There is nothing inherent in, or peculiar to, the number ten, that the principle of rotation, or, if I may so express myself, of revolution round a cipher, should belong exclusively to it. It is just as applicable to any other,—to eight, for instance. As my object is to elicit, if possible, a *reason* why this cannot be so, or, if it be, why the number eight does not present much greater facilities for calculation than ten or any other number, save perhaps a multiple or divisor of eight, that could be selected, I will be as brief as possible in trying to explain myself, and so inducing you to find space for this letter. *I know* it will be condemned. Having been a favourite idea of mine for over thirty years, I can be in no doubt about that, for, so far, the mere mention of the thing has been enough. The notion of expecting its refutation by argument seems to be regarded as an affront to the understanding of

any sane person, as, to some individuals, is the disputing a literal construction of certain texts of Scripture.

Thus, then, for the sake of avoiding any change in language and notation that can possibly be escaped, I would call eight *by the name of* ten, and my numerals would run thus:—

1,	2,	3,	4,	5,	6,	7,	10,	11,	12,	13,
One,	two,	three,	four,	five,	six,	seven,	ten,	eleven,	twelve,	thirteen,

14,	15,	16,	17,	20.
fourteen,	fifteen,	sixteen,	seventeen,	twenty.

21, 22, 23, 24, 25, 26, 27, 30, and so on. Thus carried through, 100, still called one hundred, would be equal to sixty-four,—64,—as we now express it. The great advantage of such a plan would be, the exclusion, to an unprecedented and enormous extent from all ordinary business transactions, of fractional parts, by reason of the ready subdivision of eight, its multiples and divisors, down to unity, as is easily seen,—

100 (or 64) ÷ 2 = 40 (or 32); 40 ÷ 2 = 20 (or 16), this again ÷ 2 = 10 (or 8) ÷ 2 = 4 ÷ 2 = 1.

According to the decimal system it stands thus,—and there is no arriving at unity at all,—

$$100 \div 2 = 50 \div 2 = 25 \div 2 = 12\tfrac{1}{2} \div 2 = 6\tfrac{1}{4} \div 2 = 3\tfrac{1}{8} \div 2 = 1\tfrac{9}{16},$$

which last cannot be expressed at all in decimals.

As one proof of the practical advantage of a system of octaves, we daily witness the preference given to it by nearly all our prescribers; and long may it be before our 8 oz. and 16 oz. bottles give place to 10 oz. and 20 oz., before the ounce liquid and solid ceases to be divisible into eight parts!—the remnants left to us of a system infinitely more convenient in practice than any which could be substituted for it.

I have no more to say. My chief wish is—as being nearer apparently to fulfilment—to discover a conclusive argument against it other than one based on a temporary expediency only.—I am, Gentlemen, yours respectfully,

THOMAS LOWE.

Liverpool, May 4, 1869.

P.S. I quote against myself the line of Horace, "Brevis esse laboro, obscurus fio," being well aware of the very palpable objections which may be taken to this letter. Such, however,—being prepared for them,—will not hurt me. I want to see a valid objection to the principle, or theory. I know it goes very far beyond any mere question of weights and measures, and I don't lay claim to originality.

Dr. ATTFIELD said that, in the abstract, the duodecimal system was, in the estimation of many persons, better than the decimal, and the octonary system better than either. He thought no one would endeavour to find any argument against the use of the latter system; but there was this practical objection to it, that throughout the world their system of numbers was decimal; and, as he said at the last meeting, the natural result of that would seem to be that their system of weights and measures and coins, which were but the concrete expressions of numbers, should be decimal too. That had been the tendency of all alterations in this matter for the past hundred years. It might be interesting to the meeting to know that the octonary system which the writer of the letter referred to had been thoroughly investigated, and very well set before pharmaceutists by Mr. Proctor, of Newcastle-upon-Tyne, who was himself an excellent pharmaceutist. Some five years ago he read a paper at the first meeting of the British Pharmaceutical Conference, and it was published in the Pharmaceutical Journal for 1864; and he went so far as to give a more complete system than the writer of the letter. Mr. Proctor suggested the giving of actual words as the names of the weights he would use, which differed from each other both in submultiples and multiples by 8. Thus, he would begin

with a weight somewhere about 1½ grains, and he would call that a pea; and then he would say, 8 peas make a nut, 8 nuts a plum, 8 plums an egg, 8 eggs a pound, 8 pounds a cat, 8 cats a ram, 8 rams an ox. And then in measure he suggested a similar plan. Now, this might sound rather curious, but really it was the best expression of the octonary system that he (Dr. Attfield) had met with, and it was all the more valuable to them inasmuch as it was in their Journal, and was the work of a pharmaceutist.

Mr. Bottle did not contemplate addressing the meeting, but he might remark that, living as he did on the coast, the French system was constantly brought under his notice, and he saw the importance of their becoming acquainted with it. He was not prepared to say that at the present time they, as Pharmaceutical Chemists, were in a condition to adopt the metrical system. They would want a large amount of education on the part of the medical profession before they would be able to get much in advance themselves. He thought the suggestion for a Companion to the Pharmacopœia was a good one, and that if they could work alternately by one system and the other, and get themselves familiar with it, it would be an advantage. It would be an advantage to young men commencing business to make themselves masters of the decimal system. They could not tell where they might be located in business. Therefore he would advise his young friends who were undergoing their probationary terms to take advantage of the opportunities they now had, and make themselves masters of the decimal system. It was easy for them to do it now; but when they had the responsibilities of a business resting upon them, or got beyond fifty years of age, they would find it exceedingly difficult.

Mr. Haselden said that Mr. Carteighe had already put the subject so well before them, that there was but little for him to add. As regarded the system, he thought it was the general opinion that they must come to it some day or other,—not because it was the best system that could be devised, but because it was the system most generally followed everywhere. As to how they were to make themselves thoroughly acquainted with it,—which, he believed, was one of the principal objects Professor Redwood had in view in bringing the subject before them,—he scarcely knew what to advise, unless it were that they must study the subject by working out certain sums and figures under the metrical system. Of course with the young there would be no difficulty at all, as it would be part and parcel of their education; but those in the middle of life would have, as it were, to go to school again, and it was not so easy to do that, and bend themselves to a new system. Still, necessity knew no law; and if the system was to come into use, they must find it out somehow or other. Now, as regarded the Pharmacopœia as a means of setting forth the system and impressing it upon their minds, he thought with Mr. Carteighe, that probably something in the shape of a supplement would have the desired effect; or, if certain of the Pharmacopœia formulæ were worked out and published in the Pharmaceutical Journal, it would be the means of bringing the matter before them. He should hardly like to see the whole of the Pharmacopœia as it now stood printed with the metrical weights alongside their own. It would be very tiresome to work that out. With regard to the medical profession, they were so highly educated that they would have no difficulty in bringing themselves to understand and work out this system; but it would be difficult to get them to change what they had been doing all their lives. Even at the present time they saw this when they were asked to write prescriptions in grains. The old grain was maintained as much as anything out of deference to them, and it was supposed that they would leave off using the term scruples, and that they would put the quantities in equivalent numbers of grains instead. There were very few who wrote in grains at all; the majority still used the old scruples, drachms, ounces, and so on, and there would be the same difficulty in inducing them

to prescribe metrically. For instance, a physician wished to give a grain of calomel to a child. How much was it? It was about two-thirds of a decigramme, or something like seven centigrammes. Although he quite approved of the system, he thought it would be a work of considerable time before they would be able to get it adopted, and by that time they would probably require and get a new Pharmacopœia, or a new edition of the present one. In the meantime they must all make themselves acquainted with the system in the best way they could. The more they worked out the formulæ now in the Pharmacopœia, the more likely they would be to get some acquaintance with it.

Mr. CARTEIGHE would like to rectify two omissions, to which he attached some importance. In the supplement or companion he had suggested the doses should be put in the same way as the weights. They wanted to give doses of so many grains,—5 grains, say, or 15 grams. It should be written 15 grains' dose, and after that the equivalent 1 gramme. This would render it of great service, and it would not clash with any of the existing handbooks. As regards prescribing, he intended to mention that this process of fusion would be very much easier for the medical profession if they prescribed in doses. He conceived that to be the best way of prescribing. He thought it was much better to order their ingredients in the dose they intended to give. To put the quantity of liquid and the quantity of menstruum was better than to lump them. If they did that they would reduce the number of weights, and they could ring the changes upon a very small number of things as regarded mixtures.

Mr. MORSON did not know whether there existed in England any work of a pharmaceutical character which gave the relative weights of the French and English systems in a common table, which might be placed on the back of a card; but commercial men, who paid great attention to these things, had a book in which they could see the price of a kilogram of any substance and its English equivalent. Supposing a kilogram should cost so much money, they could ascertain what that would represent in English money per pound weight, and so on, down to ounces, and other small quantities. It seemed to him that a simple table of that description, placed in the pharmacy or shop of any chemist, would give him the relative weights at one view. It might be done on the back of a card, and hung up or pasted against the wall, where it would be always ready for reference.

The CHAIRMAN remarked that the book Mr. Morson had referred to was exceedingly convenient, and there was no difficulty in understanding it immediately. It was astonishing with what facility even common porters got to use the French system in weighing up goods, when they had had but very little practice. If they had a set of French weights by them, they got to talk of kilograms and grams just as freely as they did of ounces, pounds, and hundredweights. That was his experience and the experience of others who had had much dealing with the French weights. He did not see there would be any very great difficulty in the way of introducing the metrical system. It was so much simpler than the existing method that it would facilitate calculations immensely. Any one who had had to calculate sums of money, for instance, in dollars and cents, must have been struck with the simplicity of the calculation. The ease with which an invoice was made out in the American currency was marvellous as compared with the labour which even the most ready reckoner experienced in calculating an invoice or bill of parcels in our own currency of £. *s.* *d.* The first great difficulty, as it appeared to him, was to get into the mind some idea of unity; the unit they started from, and all the rest being multiples by 10, it was just as easy as putting down 1, 2, 3, 4, 5, 6, 7, or the date of the year. As Mr. Carteighe had brought before the meeting the

subject of the examinations, he (the Chairman) would observe, that in future the Board of Examiners of this Society would require of the candidates a familiarity with the metrical system; and, therefore, it behoved every student of pharmacy to make himself acquainted with it. This would, in a short time, be the means of familiarizing a large number of active men with the system, and, no doubt, tend greatly to bring it into general use. The idea had also been suggested that this Society should assist local associations, by sending to them series of weights, so that students in the country might be able to become acquainted with the metrical system. This was a very good suggestion, and he hoped it might be carried out; and he trusted that, first of all, they might have a perfect set of weights and measures in their own Museum. He thought there was great objection to bending an old system to a new one; and he confessed that he sympathized with Mr. Carteighe in his objection to Professor Redwood's tetram. He would rather abolish the old system, and begin *de novo* with a new one.

Mr. MARTINDALE thought the principal difficulty in introducing the new system in pharmacy would be with regard to measures. The difficulty would be for a physician to give anything to represent an ounce dose. In the London hospitals they prescribed one ounce, which was generally a dose; and they prepared enough to last the patient a certain time. There was nothing in the metrical system that would correspond to that, and in that consisted the objection he had to that system, as regarded measures. The medical profession were somewhat averse to it. At present, medical students were taught the metrical system in most of the chemical laboratories before they entered any real practice in pharmacy, and it was some difficulty to get them to understand the system of grains and drachms, when they had been first taught the system of grams, centigrams, decigrams, and so forth. There was no doubt the duodecimal or octavial system might be preferable in some cases; and he should say that the duodecimal had some advantages over the octavial. So long as they had the decimal system of figures generally applied, they would be a long time before they could hope to have the octavial system; in fact, he thought that was quite out of the question.

Dr. REDWOOD, in reply, said there were two considerations principally which induced him to bring this subject forward. The first was, that in their present system, and especially as it was now arranged for pharmaceutical use and adopted in the Pharmacopœia, there was a very great defect, which he referred to in his communication at the last meeting, namely, that they had no integer between the grain and the ounce, and that there was no simple relationship existing between these two; that the ounce was not the simple multiple of the grain. The great inconvenience, in some respects, and the very obvious clumsiness of this arrangement was very strongly impressed on his mind in the preparation of the Pharmacopœia; and at that time, in discussing the subject with the Committee, it was generally felt and admitted that the system in use at present could be only looked upon as a temporary expedient which must be superseded sooner or later. This, then, was the first consideration that induced him to think it desirable to bring the subject before this Society. And the other was, that the subject was now occupying, and had for some time occupied a great deal of the attention of many very eminent men, who were much impressed with the necessity for the adoption of some new system of weights and measures in this country, and who generally, although not uniformly, agreed in considering the metrical system that which it would be wisest and most expedient to adopt, as the best system that had yet been suggested as a whole, and that there was a better chance for its universal adoption throughout the civilized world than there would be of any other system. And many of those gentlemen who had recently been investigating the subject and endeavour-

ing to further the common object which they had in view, had looked to the Pharmaceutical Society as likely to aid them in their object. They were anxious to have an expression of opinion on the part of pharmaceutists, as practical men, and educated men, and it was suggested to him that it would be very desirable that the subject should be discussed in that room, in order that the members of the Society should express their opinions, and that they should go before the world. These were the two principal considerations which induced him to bring this subject forward. The opinions which had been expressed during the discussion agreed very much with his own. Without going so far as to represent the metrical system as perfect, they admitted that as a whole it was the best they had, and that it stood the best chance of being universally adopted. Defects there certainly were in it, and it was not necessary, nor would it be wise for them to shut their eyes to such defects as existed. The taking of the meter as the initial integer was probably an error. It would have been better to have selected such a measure from practical, rather than theoretical considerations. Even the perfect uniformity of the relationship of the different integers one to another, in a practical point of view, was not always conducive to convenience. It might be compared to the adoption, by a railway company, of a system of starting and stopping the trains in which they were started at equal intervals of time, say of two hours or five hours, and were made to stop at stations fixed at equal intervals of space, say of ten miles. Now, this would be very systematic, and, as a system, might appear very good, but the effect of it would be, that trains would be starting when people did not want to travel, and would be stopping where nobody wanted to go. Our system differed from the metrical system in being founded more upon experience, and less upon theory. In our system the measures were suited for the purposes for which they were intended. They had the grain as an integer for small quantities; and a most convenient measure it was for the measuring doses of medicines. They had the ounce as the integer for groceries, consisting of spices and articles of that description, a perfectly convenient integer. Then there was the pound and the hundredweight, for other quantities for which they were well suited. It was true there was not a uniform relationship between the grain and the ounce, the ounce and the pound, the pound and the hundredweight; but these integers were fixed and established by experience; they were the quantities that had been found most convenient for the purposes for which they were intended, and in that there was, no doubt, an advantage. Nevertheless, there was a great want of uniformity, and our systems had become fused together, as it were, so that they had not any one system as it originally existed. They had fused together the troy grain with the avoirdupois ounce and pound, and that was one of the great defects in their present arrangement. And looking at this great defect as it now existed, it was quite obvious that they must find a remedy for it. The question was how were they to accomplish that? There were men of eminence who were of opinion that the metrical system was not the best, and they would not give their adhesion to it, or advocate its adoption in this country, because they considered that an octavial system or duodecimal system would be theoretically and practically better. But the great mass of men who were inquiring into this subject waived slight defects of that description, because they said there was no other system that stood the chance of being generally adopted. At the present time this country stood out almost alone as the only advanced nation which had not done anything towards introducing the metrical system of weights and measures into this country; and if we were to adopt it, it would, in a very short time, become universal throughout the world. That was one great thing to be looked to, as the greatest advantage would be the fact of its being a common language, a universal system. And what he was anxious to do was to prepare the way for it, seeing there was every probability that before

many years had passed it would be recognized by all to a greater extent than it had been hitherto. He believed the difficulty was not so much that of inculcating a knowledge of the system, as mastering a knowledge of the value of the integers; and that was one great point that he aimed at in his communication. His object was to promote the adoption of some means by which they could make themselves more thoroughly and generally acquainted with the values of the integers. Now, he did not consider that that would be sufficiently effected by their merely going into a museum and looking over a set of metrical weights and measures. What he wanted to see done, was something analogous to that which existed with reference to our own weights and measures. A grain was a grain of wheat, the inch was three barleycorns, the foot the length of a man's foot, the yard was the stretch of the arm, which was a yard as nearly as possible, and most men of ordinary size would step a yard. In this way they perfectly familiarized themselves with these integers, and they always had sufficiently definite ideas with reference to them. It appeared to him, that more than anything else, it was something of that description that was wanted with reference to the metrical system; and what he should like to see done, and what he had already suggested in respect to pharmacy, was to have some articles, such as lozenges, that should be made to represent the gram, and which should be marked a gram. He should like also to see coins of a definite weight with the weight marked upon them. There were coins in America which did correspond with the weights, but he wanted to see the weights marked upon them. He should like to see also the centimeter marked upon every postage-stamp; it would just come into a postage-stamp, being one-third of an inch; so that no person would have the excuse of saying that they did not know what a centimeter was. In that way he believed they would do more towards placing themselves in a position, when the proper time came, to take up this system as a substitute for their own, than they could in any other way with equal advantage. That there were great difficulties in bringing about a general adoption of the system seemed to be admitted on all hands, and that was the opinion which he had entertained, and still entertained himself. He felt, especially with regard to medical men, that there would be very great difficulty in inducing them to adopt the metrical system, unless it be very slowly indeed. He entirely approved of what Mr. Carteighe had suggested, that in the examination of medical men the metrical system should be introduced, and that they should be compelled in that way to make themselves acquainted with it; and in addition to that, some of the works which went into the hands of medical men could have the metrical system of weights and measures introduced,—that would probably be the most efficient means of preparing them for the adoption of the system. He still thought that the introduction of the metrical weights and measures, together with our ordinary weights and measures, side by side, in the Pharmacopœia, would do very little good; in fact, he thought it would be objectionable, as it would greatly encumber the Pharmacopœia, and complicate the matter, and, as it appeared to him, it would render it more probable that errors might be committed in making up these preparations. Moreover, he did not think it would teach much. What they wanted was to know the values of the integers, and to have clear and definite ideas of these. If they could have the two put side by side in a simple form, then it would teach something, but where they had to give it in a complicated form, he did not think it would teach a great deal. He felt more favourable to the adoption of the suggestion of having a sort of supplement to the Pharmacopœia, in which the metrical weights should be introduced, than to their introduction in the Pharmacopœia itself. The discussion altogether had tended to show that pharmaceutists generally were desirous of doing all they could to prepare the way for the introduction of this system when the proper time arrived for doing so.

The CHAIRMAN having announced, amidst great applause, that Dr. Attfield had just authorized him to say that he should be happy to present his set of metrical weights and measures to the Museum of the Society, the meeting adjourned.

CONVERSAZIONE.

The Annual Conversazione, which was held in the Society's rooms on Tuesday, the 18th of May, was attended by an unusually large number of visitors who had responded to the invitations issued by the President and Council, and abundant material for discussion was afforded by the display of objects illustrative of the most recent discoveries in pure and applied sciences which each apartment contained.

Through the kindness of Professor Church, M.A., those present had an opportunity of seeing specimens of turacine, a new pigment, concerning which the discoverer has communicated to us the following memoranda :—"Turacine is a pigment contained in the red feathers of certain birds belonging to the *Musaphlagidæ*. It has been extracted from several species of these birds, of the genera *Corythaix* and *Musaphlaga*. Weak caustic soda is employed to dissolve the turacine from the red barbs; the dissolved pigment is then precipitated by hydrochloric acid, washed and dried. Thus prepared, turacine appears in the form of dark scales having a red-violet lustre. Its spectrum resembles that of scarlet emorine, having two absorption bands in the green. The most remarkable characteristic of turacine is, however, the occurrence in it of a definite, constant, and irremovable proportion of the metal *copper*. The ash of turacine is pure black copper oxide. Copper occurs only in the red parts of the feathers, not in the black A few red barbs burnt, and moistened with hydrochloric acid, give the copper spectrum at once in the Bunsen flame. The birds, when bred in England and kept in captivity, produce the same cupreous pigment. The plantain fruits on which some of the species chiefly feed have been found to contain distinct traces of copper. It should be added that it has been conclusively proved that the copper is constant in amount in the turacine derived from different species, and that it cannot arise from any accidental source whatever. The atomic relations of turacine are nearly given in the formula $C_{50}H_{56}CuN_5O_{19}$. It contains 5·9 per cent. of copper." The specimens exhibited comprised,—turacine; turacine dissolved in soda; turacine suspended in water; wings and feathers of the *Corythaix albocristata*, one of the commonest touracos, or plantain-eaters; a feather touched with soda solution in three spots, and washed. The spectrum of this remarkable body was shown by Mr. Browning.

Much interest was manifested in an experiment shown by Mr. Roberts, illustrating Mr. Graham's discovery of the expansion of palladium by hydrogenium. A slip of palladium foil, one side of which has been varnished, is made the negative electrode of a voltameter. On passing the current the hydrogen, or much of it, instead of being evolved, is absorbed on one surface of the palladium, which, being expanded, becomes curled like a watch-spring. On reversing the current the effect is reversed, as the evolved oxygen then carries off the hydrogen.

The spectrum of a supposed new element jargonium, contained in jargon, was exhibited by Mr. Browning (Mr. H. C. Sorby, F.R.S., the discoverer, having kindly lent the jargon for the purpose): some new and very beautiful lakes produced from coal-tar colours were contributed by Mr. W. F. Perkin,

F.R.S.: and a specimen of the chloride of a new base, termed apo-morphia, was shown by Dr. Matthiessen. This body has been quite recently discovered by Dr. Matthiessen and Mr. Wright. The specimen shown was said to have been produced from fifty pounds of morphia, supplied by Messrs. Macfarlan, of Edinburgh. It is described as being a powerful non-irritant emetic and contra-stimulant.

Some fine specimens of hypophosphite of lime; permanganate of potash; iron reduced by hydrogen; and tobacco grown and manufactured in Victoria, were exhibited by Messrs. T. Morson and Son: some beautiful specimens of metallic zirconium crystallized from aluminium; metallic indium; cæsium and rubidium alums, etc.; by Messrs. Hopkin and Williams: some large masses of crystallized chloride of gold and nitrate of silver; by Messrs. Johnson and Sons: specimens of extract of belladonna root and of plaster made therewith; by Mr. Balmer: a collection of the commercial kinds of india-rubber and of gutta percha, together with a few dried plants producing those substances; by Mr. James Collins (Curator in the Society's museums): specimens of cinnamic acid from balsam of tolu, and cinnamates of calcium, cadmium, and zinc; by Mr. E. A. Webb (student in the laboratories): and some remarkably fine specimens of scammony root and resin; by Messrs. Hearon, Squire, and Francis.

A collection of diamonds, and minerals found with the diamond, from the Cape of Good Hope, and specimens of Derbyshire and Italian inlaying were contributed by Mr. Tennant: a fine specimen of opalized wood from Tasmania; a coloured cast of a meteoric stone seen to fall in Griqualand, South Africa, on March 20th, 1868; models of celebrated large diamonds; and a fine crystallization of acetate of lead; by Mr. James R. Gregory: a beautiful collection of beryls, emeralds, topazes, etc.; a collection of natural crystals; mounted specimens of *Cuplectella speciosa*, Gray (Venus's Flower-basket), and *Hyalonema Sieboldii*; a case of corals, echini, etc.; and several Danish stone and bronze implements; by Mr. Bryce M. Wright.

Mr. Keates exhibited his new photometer standard light and balance. This apparatus has been designed with a view of providing an unvarying source of light to be used in the place of sperm candles as a standard in estimating the illuminating power of coal-gas. It consists essentially of a photometer-bar balance, from which is suspended a moderator lamp, so constructed as to ensure a uniform rate of combustion of the sperm-oil burnt in it.

Dr. Dupré's new polarizing saccharometer; a new electric lamp, in which both carbons move without clockwork; a spectroscope, in which the dispersion may be instantly doubled or trebled without changing any of the adjustments; a powerful magneto-electric machine, with quantity and intensity armatures; a micro-spectroscope, with new blowpipe beads, by Mr. H. C. Sorby, F.R.S.; and a new miniature spectroscope containing seven prisms; were exhibited by Mr. Browning: an alphabetical dial telegraph instrument and a magnet of unusual power with regard to its size; by Messrs. Siemens Brothers: an ozone generator for disinfecting sick-rooms or hospitals; the polarization of crystals; pocket spectroscopes; Ladd's magneto-electric machine; and an improved kaleidophone; by Mr. Ladd: Lecount's polariscope and an assortment of unannealed glass; Steward's polariscope and selenite designs; improved polariscope; brass body telescope, with 3 in. object-glass and day and night eyepiece; and Ackland's optometer and tables; by Messrs. Horne and Thornthwaite: a series of historical lantern-slides; by Mr. Highley: a self-recording aneroid barometer; by the London Stereoscopic Company (scientific instrument department): a new form of stereoscope; a new miniature photographic apparatus; and enlargements of photographs in carbon by Edwards's process; by Messrs. Murray and Heath: the optic axes of uniaxial and biaxial

crystals in polarized light; frames containing a set of Dr. Maddox's photo-micrographs; a frame with a set of electrotypes from the Mudie national medals; specimens of carbon printing; a photograph from a sketch by Fid, 'The Drama, Past and Present;' and a powerful medical coil-machine, with primary and secondary currents (in action), by Mr. How: a collection of apparatus for the indication of fire-damp in mines or coal-gas in houses; a large steel shaving (said to be the largest ever cut) from the works of Sir John Brown and Co., of Sheffield; a portion of the slag formed by burning forged notes and documents, as well as base coin, at the Bank of England; and part of the slag formed by burning a mass of Bank of England notes; by Mr. George F. Ansell: and a collection of apparatus for estimating the value of lubricating oils, by Professor Redwood.

Microscopes were exhibited by Mr. Ross; Messrs. R. and J. Beck; Messrs. Horne and Thornthwaite; Messrs. Murray and Heath; Mr. Collins; Mr. How; and Mr. Edward Histed.

Commander Bourchier exhibited models and diagrams illustrating Welsh and Bourchier's apparatus for saving and preserving life at sea. This is proposed as a substitute for the life-buoys at present in use, over which it appears to possess several advantages. It consists of an air-tight casing of metal with a lattice-work bottom, the upper part of the casing providing the buoyant power, while the lower part is formed into a tank for fresh water.

The apparatus is provided with a couple of weighted rods to give stability in the water, and two tall masts furnished with flags and port-fires to guide the swimmer to the buoy and to ensure his being afterwards seen and picked up. These rods and masts are made telescopic to economize space, and are not visible until the apparatus is, by pulling out a single bolt, released from its supports on board ship and falls into the water, when they immediately shoot out from the interior of the apparatus; the fall of the weighted rods raising the masts. Once within the apparatus (and we are assured that it is easier to get in than to get out), a man is comparatively comfortable: nearly half his body is out of water; the sharks cannot touch him; and, above all, his safety does not depend upon his retaining sufficient strength to grasp the buoy. Should he be so unfortunate as not to be picked up within a reasonable time, he has in his cistern of water the means of prolonging life for a couple of days, and we believe that the inventors intend that the apparatus shall be provided in addition with a tin of preserved meat.

Mr. F. N. Gisborne exhibited his patent balance-weight steering signals; some specimens of Gisborne's anti-corrosive paints, which do not soften under water; a new form of telegraph post, with internal insulation; Gisborne's magnetic torpedo trigger; a specimen of Horsley's powder, with an iron plate showing its enormous power; and some specimens of gold quartz from Nova Scotia.

Considerable attention was attracted by an exhibition of apparatus by Messrs. A. M. and M. A. Wier, illustrating their new system of atmospheric telegraphy, for railways, ships, mines, warehouses, hotels, etc. The collection comprised the following instruments, all being in operation during the evening, and appearing to work most satisfactorily:—

Wier's atmospheric telegraph, for communicating orders between captains and engineers, or between captains and helmsmen; for automatically showing the position of the helm; for registering on deck, or in the captain's cabin, the revolutions of the engine; for automatically showing red and green lights at the mast-head, to prevent collisions at sea; for working Major Bolton's system of flash lights; and for fighting guns and giving orders on board men-of-war, etc.

Mr. Hamilton Pendred, C.E., of the Wire Tramway Company, exhibited a working model of the wire tramway. This tramway is intended for the transport of mineral and agricultural produce in localities as yet unprovided with railways. It consists of an endless wire rope, supported on a series of pulleys carried by substantial posts, and set in motion by a steam-engine, through the medium of a Fowler's clip-drum. The stone or other material is conveyed in boxes attached to the rope by a pendant of peculiar shape, which maintains the load in equilibrium, and at the same time enables it to pass the supporting pulleys with ease. The system may briefly be defined as a development of a plan not unusual in some mining districts of bridging over a river or ravine by a single wire-rope, by which, carried in a bucket suspended by a pulley, the necessary loads are transmitted from one point to another. The principal advantage of this system is its economy. No bridges, tunnels, or embankments are required; in fact its cost does not very greatly exceed that of the erection of a system of telegraph wires.

A most ingenious self-regulating apparatus for making nitrous oxide gas was exhibited in operation by Mr. Porter. The apparatus is peculiar in being provided with what is termed a thermal moderator. This instrument is practically a small cistern in communication with the lower part of the first of the series of wash-bottles, and containing a float. The wash-bottle and the cistern being in communication, the water which is used for washing the gas stands at the same height in both as long as a similar pressure is exerted upon its surface in each vessel, but as soon as gas begins to be evolved from the fused nitrate of ammonia in the generating flask, the water in the wash-bottle is subjected to increased pressure; a portion of it is forced into the cistern, and the float is raised to a corresponding extent. Now if we imagine the float to be in connection with a lever attached to the cock which regulates the supply of gas to the burner under the generating flask, we shall have no difficulty in understanding the *modus operandi* of this simple arrangement. As an additional safeguard against accidents, the first wash-bottle is so fitted up that, in the event of the delivery-tube becoming blocked, the water is ejected from the bottle, and free egress provided for the gas, which, in rushing out, sounds a whistle. This apparatus, which appeared to work with great regularity, supplies a want that has been felt since the introduction of nitrous oxide as an agent for producing anæsthesia in dentistry.

Another novelty was shown by Dr. Estor in the shape of his process for the preservation of meat. This plan consists in hanging the meat in a close chamber or safe, and subjecting it to the action of sulphurous acid and chlorine gas applied in succession, and generated by the burning of a small pastille. The safe exhibited contained a joint of meat from an animal stated to have been slaughtered more than a month ago. Dr. Estor's explanation of the theory of the process is this :—

"When the pastille is burning, sulphurous acid is produced, of which a considerable portion is absorbed by the meat. As the bowl becomes hot, chlorine gas is given off from the interior. These gases separately have the power of decomposing water slowly, but in conjunction with each other their action in this respect is very rapid, the sulphurous acid taking the oxygen and the chlorine combining with the hydrogen. Thus the original gases disappear, and two new substances are formed, namely, sulphuric acid and hydrochloric acid. The two powerful gases having done their work are transformed into two others which are harmless and, it may be said, wholesome. Sulphurous acid alone will preserve meat for a time; so will also chlorine, but the meat thus preserved is nauseous; whereas when the gases are used conjointly in the manner above described and in due proportions no trace of either remains."

A "Palinurus," for determining the deviation of iron ships' compasses, was exhibited by Mr. W. F. Reynolds: a model of Manbré's "Convertor," used in the manufacture of glucose (the starchy matter mixed with three per cent. of sulphuric acid is exposed in this convertor to a pressure of 90 lb. of steam, whereby the whole of the starch is in half an hour converted into glucose, and no intermediate products are left); a specimen of glucose; a sectional model of Allibon and Manbré's steam boiler (this boiler gives twice the heating surface of the best form of Cornish boiler, and evaporates 12 lbs. of water for every pound of coal); specimens of Sterne's springs and buffers, illustrating the attachment of india-rubber to iron and steel (the rubber is united to the metal by chemical means); a specimen of metallic junction belting for driving heavy machinery; a specimen showing the fracture of india-rubber united to steel under a strain of 2782 lbs.; and specimens of Pavy's paper of mixed vegetable and animal materials, applied to furniture hangings, garments, and table-covers, etc.; by Mr. W. T. Fewtrell.

An extremely simple but very effective apparatus for disinfecting hospital wards, etc., was shown in action, by Mr. Tustin, of the London Hospital: a cleverly-designed plaster-spreading apparatus, in operation; by Mr. Martindale, of University College Hospital: Bushby's pill machine; by Messrs. Bailey and Co., of Salford: two materia medica cabinets; by Messrs. Evans, Lescher, and Evans: improved soda-water apparatus in action; by Messrs. Dows, Clark, and Van Winkle, and Messrs. Eugène Géraut and Co. (both firms affording visitors the opportunity of satisfying themselves of the excellent quality of the product): some casks prepared by Scally's patent paraffin process; by Messrs. Coleman and Co.: Atlee's patent taps; Bourne's patent vent-valves for casks and jars; a stone jar fitted with same for liquids of any kind; an improved oil can with tap and vent-valve for petroleum and other oils; and a specimen of Kendall's bisulphite of lime for the preservation of meat, vegetables, etc., and for the prevention of fermentation, growth of mould, etc.; by Messrs. Wheeler and Croucher: and a handsome mahogany counter; some specimens of drawers and glass cases; and a sponge case of new design; by Mr. Kidston.

In the lecture theatre Professor Tomlinson demonstrated the influence of clean and dirty surfaces on crystallization, ebullition, and distillation; while, at an earlier hour, the same apartment was devoted to an exhibition, by Mr. Martin, of the London Stereoscopic Company, of some beautiful photographs of Abyssinia; the exhibition being designed to illustrate the application of the oxy-hydrogen dissolving-view apparatus to lecture illustration.

Mr. Waddington exhibited on the screen some remarkably large specimens of the fat acids mounted as polariscope objects; and Mr. How showed a number of photographs of microscopic objects, by Dr. Maddox; some beautiful photographs of British scenery, comprising views in England, Wales, and Scotland; and several new effects obtained with the polariscope and the kaleidoscope.

Woodbury's photo-relief printing process was exhibited in operation by the Photo-Relief Printing Company, Limited, and many were enabled to take away with them tangible evidence of the beauty of the results obtained.

In one of the upper rooms Bunsen's modification of the Sprengel air-pump for filtration and evaporation *in vacuo* (described at p. 596 of the present volume of this Journal) was shown in operation; while in another apartment an exhibition of vacuum tubes and induction apparatus was conducted by Mr. Apps; and the phosphorescent butterfly was shown by Messrs. Murray and Heath, by the aid of the magnesium light.

The Council Room was as usual devoted to the exhibition of a large number of living medical and economic plants, from the Royal Botanic Society's

Gardens, obtained through the kindness of Professor Bentley. A portion of the tabling in the Library was occupied by the service of plate recently presented to Mr. Sandford.

A number of paintings, many of them works of great merit, were contributed by Messrs. Vokins: photographic views of Melbourne; and the great seal of Queen Elizabeth; by Mr. T. N. R. Morson: portrait, by Mr. Stanton, of Mr. B. Brogden Orridge, F.G.S., by the Artist: landscapes, by Mr. Walter F. Stocks ("Ecclesbourne, near Hastings," and "Evening"), by the Artist: a list of some of the members of the Company of Mercers of London, including Whittington, William Caxton, Bacon (Nicholas), Sir Geoffry Boleyn, Cavendish, Colet, Coventry, Sir Baptist Hicks, Sir Rowland Hill, Sir William Holles, Sir Thomas Leigh, Sir Thomas Middleton, Pakington, Rich, Sir Thomas Rowe, Sir Thomas Seymour, Sir Ralph Warren, etc. etc.; and genealogical tables showing the connection between the *people* and the *peerage*, through the Corporation of London; by Mr. B. Brogden Orridge, F.G.S. (the compiler): some very curious ancient North-American Indian pestles and mortars, from California (El Dorado Co.); by Mr. Robert White: a Russian pharmacopœia, loot from drug-store at Balaklava; an Egyptian inkstand and reed pen; and an interesting diagram illustrating the progress of the science of numerals; by Mr. S. C. Betty: some handsome busts; by Mr. T. Butler (the sculptor): a number of art bronzes, by Barbedienne; by Messrs. Jackson and Graham: an ebony coffret, cloisonné enamel; ornamentation by Lepec; a series of bronze busts of the twelve Cæsars; an Indian serrated forked-end sword, a damascened Indian sword and scabbard; a Toledo sword and scabbard, etc.; by Messrs. Phillips Brothers and Son: a small tazza of damascened work, by Zulago; and an enamelled vase, by Lepec; by Mr. T. Morson, jun.: portraits of musical celebrities, Mr. Hermann Vezin, Miss Neilson, Miss Sheridan, the Pope, Longfellow, Professor Owen, the Duke of Argyll, etc.; by the London Stereoscopic Company: and an engraving from Landseer's portrait of the late Mr. Jacob Bell; by Mr. Hills.

TWENTY-EIGHTH ANNIVERSARY OF THE PHARMACEUTICAL SOCIETY.

The Annual General Meeting was held on Wednesday, the 19th of May.

MR. G. W. SANDFORD, PRESIDENT, IN THE CHAIR.

The attendance of members was very good.

The CHAIRMAN, in opening the proceedings, said it had occurred to him that owing to the altered circumstances of the Society, more time than usual would be required by the members for the discussion of various matters affecting the welfare and interests of the general body, and he therefore proposed to occupy less time than was his wont in touching upon the general affairs of the Society. He was not deterred by the fact that under the new system all members were entitled to vote without personal attendance at the meeting, as he believed other matters besides voting would induce them to attend, and on that point the present gathering did not disappoint him. He considered it of great importance that members should attend the meetings and express their opinions, and could not help feeling that the Council would be greatly strengthened and supported, as well as in some degree guided, by opinions thus enunciated. He was not deterred either by want of facts pleasing to talk about, because there really had been a good deal done since their last meeting. For the last five

years he had had to speak of things which he hoped would be done, but now he was in a position to say they were accomplished;—he could not but congratulate the Society upon the fact. Still he could not refrain from reminding his audience of the means by which the end had been achieved, and the Society established in the public favour. For many years he had been acquainted with the working of the Society,—had been a member of the Council for eleven years, he believed,—but this period had passed very rapidly and very pleasantly, and the success which had been achieved he attributed mainly to the exclusion from the beginning of all self-interest on the part of the founders and promoters, and to the adherence to the fundamental principle first laid down, that the Society could only subserve the welfare of its members by enabling them better to minister to the wants of the public. It had always been the policy of the Council to abstain from any interference with private matters affecting the conduct of business; regulations which might be good in one locality or situation would not apply universally. Sometimes, he was aware, they had been blamed for not interfering with these things, and charged with indifference: but his feeling was, that if they had gone into such matters they would have introduced explosives into the Society which would have torn it to pieces. It was only by union that they had attained the position they now occupied. He mentioned this, not so much to congratulate the members on what had been already achieved, as to show the necessity for moderation in exercising the powers with which they were now invested. It was not the same now as formerly, when the connection between the Society and chemists and druggists generally was a purely voluntary matter. They had now, in a certain sense and to a certain degree, a sort of control over chemists and druggists,—not in their private affairs, but in general matters affecting their business. He recollected saying on one occasion, when a conference was held in that room with gentlemen who were then called outsiders, that if any great powers were proposed, he, for one, should be the first to decline them. As the Pharmacy Bill passed through Parliament, several attempts were made by friends of the Society to confer stringent powers upon it; some were resisted and some were confirmed, and in relation to such matters he could only say that their wisdom would be best proved, and the interests of the Society would be best secured, by a temperate and yet loyal fulfilment of those duties. Certain powers and duties were entrusted to them by the Government, and it would be their duty to exercise those powers and fulfil those duties temperately, firmly, and judiciously. He could not conclude without saying one word with regard to the Benevolent Fund, because he was afraid that now they had £10,000, some might be inclined to stop short. £10,000 was a nice little sum for a man to retire upon, but if it so happened that his family increased, he might think the interest upon it was but a small provision. That was the case with them; they had just increased their family, inasmuch as all who had been on the register of chemists and druggists were now eligible to partake in the benefits of the Benevolent Fund. He hoped, therefore, that they would not at all relax in their efforts, or be satisfied to stick at £10,000. They had no almshouses where they kept people in a sort of genteel pauperism, but they were able to relieve widows and men who had fallen into distress, and with a little exertion he thought they might do even more than that. It had been suggested more than once that they might help a widow to educate her children, and if furnished with more means there was no reason why they should not do so.

The Report was then read by the Secretary.

REPORT OF THE COUNCIL.

FINANCIAL STATEMENT.—*From January 1st to December 31st, 1868.*

Receipts.	£	s.	d.
Balance in Treasurer's hands (Jan. 1st, 1868)	655	15	1
Balance in Secretary's hands (Jan. 1st, 1868)	9	14	6
Life Members' Fund:			
Fees 110 5 0			
Interest 79 8 4			
	189	13	4
Government Securities:			
Interest	134	11	0
Rent	100	0	0
Arrears of Subscription	354	16	6
Subscriptions:			
359 London Members 376 19 0			
1380 Country Members 1,449 0 0			
280 Apprentices 147 0 0			
177 Associates 92 18 6			
	2,065	17	6
Fees:			
82 Pharmaceutical Chemists 578 11 0			
112 Chemists and Druggists 453 12 0			
203 Apprentices 426 6 0			
204 Modified Examination 214 4 0			
22 Registration Certificates (Jury) 1 2 0			
	1673	15	0
Fees:			
Lecture	232	11	6
Laboratory	723	15	6
Journals:			
Balance of Account	332	4	7
Balance due to Secretary (Dec. 31st, 1868)	24	2	8
	£6,496	17	2

Expenditure.	£	s.	d.
Life Members' Fund:			
Investment	146	19	7
Government Securities:			
Expenses in Transfer of Stock	3	4	0
Conversazione 99 18 4			
Parliamentary and Sundry Expenses attending the Registration under the Pharmacy Act 63 12 0			
Pharmaceutical Meetings 12 13 5			
Diploma Cases 5 8 0			
Repayments 9 9 0			
Sundries 5 7 4			
	196	8	1
House Expenses	41	16	8
Rent, Rates, Taxes, and Insurance	455	13	9
Repairs and Alterations	142	7	0
Apparatus	6	14	0
Library (including £123. 12*s.* 6*d.* for Bookcases)	172	4	9
Museum:			
Specimens and Sundries 25 3 9			
Curator's Salary 49 0 0			
	74	3	9
Furniture	70	13	4
Stationery and Office Expenses	34	19	4
Postage	148	15	8
Printing and Engraving	247	18	1
Advertisements	32	3	6
Fixtures and Fittings	5	11	6
Law Costs, 1866 and 1867	67	13	8
Carriage	3	5	4
Collector's Commission	25	0	0
Travelling Expenses	146	12	3
Secretary and Registrar	387	10	0
Wages	221	15	4
Expenses of Society in Scotland	73	2	2
Board of Examiners	394	10	6
Professor of Chemistry and Pharmacy, including payment of Assistant in his Department	300	0	0
Professor of Botany and Materia Medica, including payment of Assistant in his Department	250	0	0
Prize Medals, etc.	5	15	0
Laboratory:			
Director's Salary for year 1868 200 0 0			
And percentage on Fees for Session 1867–1868 85 10 6			
Demonstrator 100 0 0			
Porter's Wages, etc. 65 0 0			
Chemicals, Apparatus, Gas, Coke, etc. 98 8 1			
Repairs, Painting, etc. 87 1 3			
	635	19	10
Balance in Treasurer's hands (Dec. 31, 1868)	2,206	0	1
	£6,496	17	2

BENEVOLENT FUND ACCOUNT FOR THE YEAR 1868.

	£	s.	d.	£	s.	d.
Balance in Treasurer's hands (Jan. 1, 1868)				262	6	1
Balance in Secretary's hands (Jan. 1, 1868)				3	12	7
Dividends				274	5	9
Donations	54	1	6			
Subscriptions	551	11	6			
				605	13	0
				£1145	17	5

	£	s.	d.	£	s.	d.
6 Annuitants, to Christmas, 1868, at £30 each	180	0	0			
2 Annuitants, elected Oct. 1868 (2 months to Christmas), at £5 each	10	0	0			
				190	0	0
Widow of a late Member, at Sunderland, towards expenses in getting one of her children into the Commercial Travellers' School (second grant)				10	0	0
Widow of a late Member, at Birmingham, permanently imbecile (second grant)				10	0	0
Member, late at Appledore, age 46, wife and six children (second grant)				20	0	0
Widow of a late Member, at Knottingley, age 75, cripple				20	0	0
Orphan Daughter of a late Member, at Southampton (second grant)				10	0	0
Member, late at New Ferry, near Liverpool, age 61, wife, age 58, both in ill-health (third grant), elected an Annuitant Oct. 1868				10	0	0
Widow of a late Member, at London (second grant)				10	0	0
Member, late of Stratford, Essex, age 64, wife and two children (second grant), now a Candidate for Annuity				10	0	0
Member, late at Wakefield, age 38, wife and six children				20	0	0
Premium on the Orphan Bentley's Policy of Assurance				1	11	0
Advertisements				2	2	9
Postage				9	16	2
Printing and Stationery				15	16	0
Purchase of £826. 9*s.* 1*d.* Consols				769	7	8
Commission on Transfer of Stock	5	12	10			
Power of Attorney	0	6	6			
				5	19	4
Balance in Treasurer's hands (Dec. 31, 1868)				31	1	9
Balance in Secretary's hands (Dec. 31, 1868)				0	2	9
				£1145	17	5

Consols., 31st December, 1867	9,023	10	11
Consols., purchase of, as above	826	9	1
	£9,850	0	0

We, the undersigned Auditors, have examined the Accounts of the Pharmaceutical Society, and find them correct agreeably with the foregoing statement; and that, as shown by the books of the Society, there was standing to the account of the Society, at the Bank of England, on the 31st of December, 1868 :—

General Fund (New 3 per Cents.)	£4,600	0	0
Life Members' Fund (New 3 per Cents.)	2,890	0	0
Benevolent Fund (Consols)	9,850	0	0
Bell Memorial Fund (Consols)	2,050	0	0
Pereira Memorial Fund (Consols)	100	0	0

FREDERICK ANDREWS,
FREDERICK BARRON,
JOHN B. MACKAY,
WILLIAM SQUIRE,
ROBERT WESTWOOD. } *Auditors.*

9th February, 1869.

At the close of a very eventful year the Council have now to submit to their constituents the customary Report of the proceedings which have occupied them since the last annual meeting. In May, 1868, mingled with the hope of success in the matter of pharmaceutical legislation, there was much reason to fear that the House of Commons then sitting would end its existence without performing the task recommended to it by the Committee of 1865. It is true the Government of the day were favourably disposed towards the Pharmaceutical Society, and fully acknowledged the necessity of protecting the public by placing restrictions on the sale and dispensing of poisons; indeed, their very favour had been, in some respects, a difficulty, inasmuch as it remained a question, during the early part of the Session, whether the Bill framed by your Council should be introduced to Parliament by some member of the Government or otherwise, and when, owing to pressure of other business, the Home Secretary was compelled to decline taking charge of it, the comparative leisure of the sittings before Easter had passed away, and it required extraordinary activity and watchfulness on the part of your Council to urge it on. Fortunately, Earl Granville, whose assistance had been sought in a previous Session, now consented to introduce the Bill in the Upper House, and to him the Pharmaceutical Society, the Chemists and Druggists of Great Britain, and the public generally, are deeply indebted for the success which, on the 31st of July, crowned the labour commenced twenty-seven years previously by Jacob Bell and the founders of this Corporation. It is not for your Council in this Report to speculate on the ultimate result of this success; they have more particularly to deal with the proceedings of last year, and are able to point with much satisfaction to the effect already produced, and made manifest in the balance-sheet just read to you; by this it appears, that although no advantage was taken of the opportunity which seemed to offer of requiring even a small fee on registration, yet the increase in the ordinary receipts of the Society during 1868 was more than sufficient to meet the great expenses entailed in carrying out the provisions of the new Act, and that increase is evidence, not merely of financial prosperity, but more notably of educational advancement, which must ever be regarded as one of the prime objects of this Society. In every class the candidates for examination have increased considerably, and a still greater augmentation will be seen in the number of students attending the Lectures and Laboratory. Of the sixty benches which the Laboratory contains, very few are now unoccupied; and the number of entries during the present session more than doubles that of any previous one since the new Laboratories were built. Doubtless, this may to some extent arise from the impossibility of entering the business hereafter without first submitting to examination, but whether that, or a desire to obtain knowledge, attract students to the Laboratory, the effect will be the same; and the Chemists and Druggists of the present time will be succeeded by men better qualified to uphold Pharmacy as a profession, as well as practise it as a trade. It is gratifying to see, by the amount of "arrears" paid up, that many seceders have put themselves again within the pale of the Society.

On the debit side of the account there are no items particularly calling for attention. The labour thrown on the Secretary by the passing of the Act seemed, for a time, overwhelming; and when it is stated that for the last three or four months of 1868 he received, on an average, a thousand letters a week, it will readily be conceived that more help was absolutely required in the office. It may, perhaps, be remarked, that nothing was added to the investments on the "General Fund" account in 1868, but it will be seen also that a large balance was left in the Treasurer's hands, and since Christmas a considerable sum has been invested.

It is the duty of this Council now to publish annually a Register as well of Chemists and Druggists as of Pharmaceutical Chemists. Under the new enact-

ments, *all* Chemists and Druggists must cause their names to be placed on the Register. The compilation of that Register, which lies on your table, has been a work of great labour, anxiety, and expense; hereafter it must appear in the month of January, but it was impossible to prepare the first copy of such a volume by so early a period in this year, as applicants for insertion were given until the 31st of December to send their notices to the Registrar, and it was not, as it will in future be, a mere matter of correction and addition. While the Registrar had, on the one hand, no desire to exclude illiberally men who had really been engaged in the trade prior to the 31st of July, 1868, he had, on the other, a plain duty imposed on him by the Act, and a neglect of that duty would have rendered him liable to fine or even imprisonment. It is quite possible that some members of this Society who may take that book home for examination, may find names therein of persons who have no claim whatever to be classed as Chemists and Druggists,—the indispensable qualification is, that they must have kept "*open shop for the compounding of the prescriptions of duly qualified medical practitioners.*" Certainly no names are inserted regarding which the required certificates have not been given by "duly qualified medical practitioners," or "magistrates," but sometimes the signing of a certificate is regarded as a mere matter of form. Many false representations have been sent in, carelessly rather than criminally, so far as the medical practitioners, or magistrates, are concerned, which, on inquiry, have been withdrawn; there may have been others, perhaps, presenting no feature suggestive of erroneous description, which have secured admission for the applicants. If so, the remedy lies in an appeal to the Council, who have the power to erase names improperly inserted, as well as to insert names improperly excluded, and as much has been done by the Legislature for the advancement of this Society, it becomes the duty of every member honestly to assist in protecting the public by purging the Register of persons who have no right to be on it.

Consequent on the Pharmacy Act of 1868, the Bye-laws of the Society required revision and additions, to enable the Council to carry out the new enactments. The alterations were very carefully considered, and will, it is believed, work satisfactorily. Already many Chemists and Druggists claiming admission under the provisions of the 18th section have been elected members of the Society. Regarding the Board of Examiners as destined hereafter to stand in a more responsible relationship to the public, the Lords of the Privy Council suggested certain modifications in its constitution; a limitation as to the number and age of its members, and their dissociation from the Council, except as concerns the President and Vice-President, who will always be *ex officio* members of the Board. These restrictions are undoubtedly right in principle, and, as they will not come into operation before 1871, will probably be unattended by any inconvenience. It will still be for the Council to control the regulations of the Board of Examiners, and to affix its seal and signature to all diplomas. In future, a man who passes the Major Examination, and is consequently registered as a Pharmaceutical Chemist, will at once receive a diploma.

Among other alterations, it has been necessary to have more frequent meetings of the Board of Examiners, and the labour of the gentlemen composing that Board has been greatly increased. When it is stated that nearly 3000 Assistants have established their claim, under Sect. 4, to the "Modified" Examination, that they cannot be taken at the rate of more than fifty in a day, and that it is scarcely possible to hold more than two such examinations per month in addition to the ordinary meetings, it will be seen that there is much heavy work in store for the Board.

Feeling that the introduction of the word "immediately" into Schedule E by some unknown hand, in the Pharmacy Act of 1868, inflicted a hardship on many Assistants who correspond exactly with the description given in Sect. 4

of persons entitled to registration as Chemists and Druggists on passing a "Modified Examination," your Council strongly represented to the Government the desirability of removing the grievance. In consequence thereof the Lord Advocate added a clause to Lord Robert Montagu's Amendment Bill, which was read a third time in the House of Commons on the 13th inst., declaring that if the three years' service had expired at any time prior to the 31st of July, 1868, it should be deemed sufficient. The rest of the Amendment Bill is intended to relieve Medical Practitioners who consider they are insufficiently described by the word Apothecary, and Veterinary Surgeons in Scotland, who hold the diploma of the Highland and Agricultural Society.

In the Session of 1868, an Act was passed to regulate the sale and keeping of petroleum. It is probable that if the attention of the Council had not been so entirely absorbed by the more important Pharmacy Act, some of the absurd and vexatious provisions which this Act contains would never have become law. There is reason to believe that the framers of the Act did not contemplate such restrictions on the sale and keeping of small quantities of benzol as are now, by a strict interpretation of the Petroleum Act, enforced. On representation being made to the authorities at the Home Office on the subject, Mr. Liddell at once promised to use his exertions to obtain an alleviation of the inconvenience; and a Bill to amend the Act of 1868 was accordingly introduced and read a first time in the House of Commons on Thursday last.

There is another question now before Parliament in which Members of this Society, and all Chemists and Druggists, are interested, namely "A Bill to amend the 'Adulteration of Food or Drink Act (1860),' and to extend its provisions to Drugs." A similar Bill was prepared, but not proceeded with, last year; but it will be remembered that, at the instance of the Privy Council, a section (the 24th) was inserted in the Pharmacy Act, bringing dealers in drugs under the operation of the Act of 1860. Your Council could offer no valid objection to this introduction, it being one of the great objects of the Society to promote purity in drugs; still, considering that many articles used in medicine are brought from foreign markets, and most ingeniously adulterated before coming to this country, they secured the insertion of words to enable the retailer to prove his ignorance of such adulteration; and, for the same reason, it becomes necessary now to watch carefully any further legislation on the subject.

The Council cannot close this report without strongly urging the necessity for continued or indeed increased activity on behalf of the Benevolent Fund. It is true the donations, subscriptions, and investments of 1868 far exceeded those of former years; it is true also that since Christmas the invested capital has reached the long-talked-of sum of ten thousand pounds; but it is equally true that the Pharmacy Act of 1868 opened a much wider field for the distribution of the fund, and consequently the standard which was deemed sufficient when none but persons actually connected with the Society could receive relief will bear a very different proportion to the requirements now that "*all persons who may have been, and have ceased to be, Members or Associates of the said Society, or who may have been duly registered as Pharmaceutical Chemists or Chemists and Druggists, and the widows and orphans of such persons*" shall be eligible to receive assistance in case of need.

There are already eight annuitants on the fund, and holding to the principle that it is unsafe to grant annuities to a larger amount than the annual interest on capital, your Council sincerely trust that the same benevolent spirit which has been growing from year to year since the system of annuities was commenced in 1865 will still actuate all who have the means to assist their poorer brethren, and that future Councils will never be compelled by want of means to reject worthy applicants for relief.

Mr. Wilson (Sheffield) then moved "That the Report now read, be received, adopted, and printed in the Transactions of the Pharmaceutical Society." It was no little pleasure to him as a country member to come up to London and meet with so many brethren as he had done on the previous evening, and to have an opportunity of exchanging opinions with them. The thanks of the whole Society were especially due to the Council for the able manner in which they had gone through the heavy work of the past year. He himself, at the passing of the Act, thought that the country members had not been duly considered, but since talking the matter over with some of his London friends, he was fully satisfied that he had been labouring under a great mistake, that their worthy President had worked very hard, and that if the Bill had not passed in its present form, it would not have passed at all. They were striving in Sheffield to establish a school after the model of that in London, though in a humbler way, and seeing to what the school in London had risen they would be much encouraged to persevere in their efforts.

Mr. Pedler said he felt much pleasure in seconding the motion. As one of the old members, he might even say as one of the founders of the Society, he could look back with great pleasure on the course they had taken. Those whose connection with it went back as far as his own, could recollect very well the difficulties they had to contend against and the opposition they met with from various quarters, both without and within the profession; but looking to the steady progress they had made, he was quite satisfied that they had done the right thing, and that the steps which they had taken were the only ones which could have brought the Society to its present state. They must, however, still go on endeavouring to improve the rising generation. He well remembered the time when there was not in the whole Metropolis any school or place of instruction in which a young man could be educated as a chemist and druggist except behind the counter; indeed the young men of the present day had no idea of the difficulties with which their predecessors had to contend. Thanks to the indomitable spirit of Mr. Jacob Bell, they had persevered until they got their charter of incorporation, which they then thought a very great thing, and still more so when the second Act of Parliament was obtained for the purpose of incorporating more perfectly the members of the Society. Now they were in a still better position, but they must keep up their endeavours to give their time and attention to raise their standard higher and higher. At one time there had been a feeling of envy on the part of those in the trade who were members, but by degrees all the best amongst them joined the Society, and as oil would rise in water, so did they attain a higher status by the superior character which they made for themselves, and went on year by year until they had raised up a body of men equal to any in the kingdom. He considered the profession of a chemist and druggist one of the most important in the present day, and calculated to do more for society than almost any other, and now that they could congratulate themselves on the passing of the "Pharmacy Act," they would stand even higher than heretofore in the public estimation. He hoped now that the Society had attained to full manhood, some memorial would be prepared of its founder, Mr. Jacob Bell,—some good biography which would convey to the rising generation a definite idea of the life and labours of that good man. With regard to the report itself, he hoped they would always have as good a balance as on the present occasion, but the Council must not forget that their great work must be that of education, and he hoped that nothing would ever be lacking for carrying on that work more and more perfectly. The young men who came from time to time under their influence must be taught that the grand thing to aim at was not so much success in business as the capacity to bring a large amount of knowledge into general use. He looked forward to the time when chemists would have a very material influence upon

society; for instance, sanitary matters came almost exclusively within their domain, and if they were studied and experimented upon, great benefit would arise to every town in the kingdom. At present the whole system of water supply and drainage was in a very backward state, and it was in reference to such matters that chemists should seek to make their knowledge useful to mankind. Allusion had been made to the Bill with reference to the adulteration of food and drink, and he recommended it to the careful consideration of the Council, especially as he believed that very mistaken notions were entertained on the subject. In the City of London, Dr. Letheby had been appointed medical officer under the provisions of the former Act, and it was decided that he should make an analysis of any article submitted to him without any charge whatever to the applicant. The result was that they had not had a single case, and therefore he hoped no encouragement would be given to the idea that the food and drink of the country was adulterated to any great extent. In the case of drugs his experience was that the quality was far superior to what it was some five-and-twenty years ago. He believed that competition in trade was the best protection to the public; it was to every man's interest to sell the best articles, and in the end he had no doubt of its paying best. He had been much struck by the great increase in the number of young men presenting themselves for examination, and therefore he would again urge upon the Council, in their altered circumstances, to spare no expense which was necessary to place the most complete educational appliances within the reach of all rising chemists and druggists. In conclusion, he would say that there never had been so much cause to congratulate the Society on its position as on the present occasion, and it was therefore with the greatest possible pleasure that he seconded the motion for the adoption of the Report.

Mr. Richardson (Leicester), in supporting the motion, desired to express his concurrence with the views of the last speaker on the subject of adulteration, and considered that the Bill now before Parliament cast a slur in some degree on chemists and druggists. Under the altered circumstances of the Society, he heartily responded to the expression of the Chairman, that further efforts should be made in behalf of the Benevolent Fund, and suggested that local secretaries should be appointed in different towns and districts to collect subscriptions. He cordially thanked the President and Council for their efforts in relation to the Pharmacy Bill, which he looked upon as a stepping-stone to the improvement of the whole trade, and he was glad to find that the expenses attendant upon passing the Bill through Parliament had not been so heavy as was anticipated.

Mr. Andrews also alluded to the necessity for increasing the Benevolent Fund; many well-known names were conspicuous by their absence from the subscription list, which he could only account for on the ground that they had not been asked. He suggested, therefore, that collecting-cards or books should be issued to a certain number of gentlemen, who would undertake to go round and collect names of subscribers. Education was the great topic year after year, but there was one deficiency, they did not get hold of the rising generation early enough to prepare them for their future studies. He ventured to suggest the desirability of founding schools for the children of chemists and druggists, in the same way as had been done by other sections of the community, —not charity schools, but such as the richest need not object to send their children to, and yet within the means of the poorest.

Mr. Collins wished to say a word with reference to the Modified Examinations. He had heard complaints—he could not say whether well-founded or not—that many persons who presented themselves for these examinations, had been rejected in consequence of not being able to grammatically translate Latin prescriptions, and give the terminations correctly. If such were the case, he

thought it a great pity, because no doubt there were many young men now in the trade who had not had the advantage of a classical education, and who would consequently fail if put to such a test, while, at the same time, fully understanding a prescription, and able to compound it ; and it would be a great hardship if they were called upon to seek a livelihood in some other manner. If he might be allowed, he would suggest that the Council exercise a little discretion in such cases, and not press too hardly upon such men as he referred to.

Mr. DAVENPORT thought there must be a great mistake in the information which Mr. Collins had received. He, as an examiner, had never rejected a candidate because he could not literally translate a prescription. There were a certain number of marks allotted to each subject, and if a young man obtained less than a certain proportion, he was sent back in that particular subject, but if he had half the total number, he was passed, being considered safe to go behind a counter. Of course the more acquaintance a young man had with Latin the better, as he would be more likely to understand the prescription, but if he could read correctly an ordinary prescription,—and he was tested by real prescriptions written by physicians of the day,—he was never rejected.

Mr. GAMBLE (Grantham) was very glad that this point had been mentioned, because he knew there was a feeling amongst young men in the country that they had a very strict examination to pass, and that the literal translation of prescriptions would be required; and even medical men who had been kind enough to examine some of his apprentices, had laid great stress upon this point, and told them that they would be " plucked" if they did not translate the prescriptions grammatically. He congratulated the Council on the passing of the Pharmacy Act, and hoped they would take into consideration the possibility of providing some means by which young men could be examined without the necessity of coming to London.

Mr. SQUIRE, as one of the original examiners of the Society, said the object always kept in view was to ensure a thoroughly practical examination, and by no means to puzzle young men with abstruse questions, as at one time was the case at Apothecaries' Hall. Having been concerned very greatly in drawing up the regulations, he had always urged the importance of making the examinations practical, not rejecting a man because he was not acquainted with a technical term or any matter not really of importance. The questions asked were those affecting everyday practice, and if the candidates could not answer them they were certainly not fit to be assistants to any member of the Society.

Mr. RIMMINGTON (Bradford) had heard with great satisfaction the assurance given by Mr. Squire, that the examinations were eminently practical, because he knew there was a wide-spread feeling in the provinces that they were not so, and that the candidates were frequently rejected on mere catch questions, and this of course struck terror into the hearts of all young men who were preparing to pass. The most learned man might be puzzled by a sudden question on a subject in which he was not prepared, and, therefore, it would not be fair to reject a young man, simply because he happened to stick at a question which came upon him unexpectedly. He was also of opinion that some leniency should be shown to men who presented themselves for the Modified Examination, many of them not having had the preliminary education which they ought previously to entering the business, but still they might have acquired sufficient practical knowledge to enable them to discharge their duties.

Mr. DEANE was very glad that this question had been mooted, because he knew there was an impression abroad that the Board of Examiners were in the habit of putting catch questions, and rejecting young men if they were not answered. He was quite sure, on the contrary, that it was the feeling of every member of the Board that this sort of thing should be avoided, and, consequently, they were in the habit of putting only such questions as had a practi-

cal bearing on ordinary business matters. Of course, young men who intended to qualify themselves for successfully following such a business, must become acquainted with a variety of technical terms, and he, consequently, always recommended young men to study these matters, and in many cases had been thanked for such advice. If the candidate were not prepared in this way, when he presented himself, he perhaps would not understand a very simple question which might be put to him, and it would have to be repeated in several different forms before an answer could be obtained. Such a man might go away thinking he had been hardly used, whereas, on the other hand, his own ignorance had caused a serious waste of time and trouble to the examiner. There was another class of young men who were dissatisfied with the examination to which they were subjected, as being too easy, and not eliciting the information which they had been at the pains to acquire, and to such men as these only were difficult questions ever addressed, such as were far beyond the reach of the others he had referred to.

Mr. MACKAY, as one of the examining Board in Edinburgh, had been very much pleased at hearing the testimony of three gentlemen belonging to the examining body on the important point raised by Mr. Collins, because he knew that the feeling referred to did exist, and it was only by mentioning the matter, and having it corrected, that men's minds would be disabused of such an error. The examiners in Edinburgh assimilated their practice as much as possible to that of their brethren in London; and as regarded the Modified Examination, to which special allusion had been made, and the reading of prescriptions, all that was insisted upon was that the candidate should read them, at any rate, correctly. They must remember, however, that these were not to be the permanent examinations of the Pharmaceutical Society. He was glad that in the Amended Act the objectionable word "immediately" had been expunged, and that any one who had, prior to the passing of the Act, been really engaged in dispensing physicians' prescriptions, might be admitted to the Modified Examination, but the time would come when this provision would no longer be in force, and then there would be only the Classical, Minor, and Major Examinations of the Pharmaceutical Society, when there would be no possibility of any disappointment from the cause referred to, because every young man would have to pass the Classical before going up to the Minor Examination. In conclusion, he would merely add, that no one was ever rejected by the Edinburgh Board who gave evidence of being able to go behind a dispensing counter, and acquit himself there to the satisfaction of his employer and the public.

Mr. HASSELBY could bear testimony that in Yorkshire, at any rate, very few chemists' assistants possessed any adequate knowledge of Latin, and they would, therefore, be very glad to learn, from the discussion that had taken place, that the examinations were not so difficult as they had supposed. He retained a vivid recollection of the kindness and encouragement which he met with when very nervously preparing to undergo his examination, which materially assisted him. The great drawback to acquiring knowledge in a country business was the very small amount of dispensing, and if this could be met in any way by the publication of notes and remarks in the Journal, it would be a great advantage. He would also suggest that there should now be a considerable increase in the number of local secretaries, not limiting their appointment, as at present, to towns which returned a Member to Parliament, or in which there were more than three Pharmaceutical Chemists. This was all the more necessary on account of the numerous persons who were now seeking to get their names on the Register. He knew a case of a man who commenced life as a farm labourer, then became a huckster, and then kept a little grocer's shop. He obtained a certificate from a surgeon, and had sent it up to be registered. Again, in the case of veterinary surgeons who kept an open shop, he thought some

alteration in the regulations would be desirable. With regard to local examinations, they would certainly be a great convenience, but he did not think the time was yet come for them; in the course of time they would be necessary, no doubt. He thought it would be an improvement to the Journal if there were occasional contributions from eminent London chemists on practical points connected with dispensing, and also if the reviews were given more at length.

The CHAIRMAN, having explained the provisions of the Pharmacy Act as affecting veterinary surgeons, put the resolution, which was carried unanimously.

Mr. BRETON then introduced the subject of patent medicine stamps, of which he had given notice, and commenced to read a paper thereupon, but, upon its appearing to be the general opinion of the meeting that such a course was out of order at an annual meeting, he handed in the paper for insertion in the Journal, if approved by the editors.

Mr. REYNOLDS (Leeds) then rose to move the following resolution:—"That, as a result of the Pharmacy Act of 1868, it is desirable that the minutes and votes of future meetings of the Council be published." He said there was some little inconsistency in the present system of electing the Council, inasmuch as before receiving the Report which had just been adopted, they were asked to decide who should represent them another year. It appeared to him that instead of waiting twelve months for the Report, the proceedings of the Council might be published monthly in the Journal, and they would be of great interest to the members, who would thus be enabled to see what part each member of the Council took in its operations. He should be the last man to show ingratitude for past services, and he hoped the President would long remain a member of the Council; but, at the same time it might be desirable to introduce some new blood into it, and in that view it was most desirable that provincial members should know the part taken in the government of the Society by individual members of the Council. At the present time he had reason to know, as the result of inquiries made all over the kingdom, the present system of voting was regarded very generally as little more than a farce; one person indeed informed him, that his practice was to vote one year for the first twelve on the list, and the next year for the last twelve, not knowing any of the names, and desiring to be impartial. The passing of the Pharmacy Act had greatly altered the relations of the constituency to the Council, which now, to compare small things with great, bore a strong analogy to the House of Commons, as representing the English people. If the members were selected to represent each a particular district, there would be a tolerable unanimity in the choice, because the different candidates would be known to the voters; but under present circumstances they did not know whom to support. He would not detain the meeting longer, especially as he believed the Council would agree in the propriety of what he suggested, but would at once move the resolution. It might be said that a report of the discussions was essential to the understanding of the votes, and if the Council thought so he had no objection; but he desired to leave the details as much as possible in their hands.

Mr. BETTY seconded the resolution, which he thought ought to be carried, in order to give the members an opportunity of expressing their opinion upon the proceedings of the Council, which could not fail from year to year to be of greater interest to the trade at large. It was only due to the Council itself that its proceedings should be known, in order, as had been suggested by the President, that they might receive the support of the members.

Mr. ORRIDGE expressed his concurrence in the sentiment expressed in the resolution.

Mr. RIMMINGTON said he had given some consideration to this matter, and was decidedly of opinion that the course proposed would be very acceptable to the

provincial members of the Society. He was convinced that there was an enormous amount of ignorance, especially on the part of the lower grades of chemists, as to the action and objects of the Society, which would be, to a great extent, removed by the publication of the proceedings.

Mr. PEDLER asked if it was intended that a reporter should be present at the Council meetings.

Mr. REYNOLDS said his resolution committed the Council to as little as possible; indeed it did not commit the next Council to anything, though no doubt they would carry out the wishes of the meeting.

Mr. VIZER desired to support the resolution. The proceedings of the Medical Council, an analogous body, were always reported. He had mentioned this matter himself on more than one occasion, though this was the first time it had been brought before them formally by way of resolution. It seemed to him of great importance that they should come to a decision upon it now, and he did not doubt that the new Council would be bound by that decision. There were several reasons why the resolution should be adopted. In the first place, the Society now held a very different position from any it had held before. They were now become a public body, instead of a simple voluntary association, over which the Council had but a limited power; and every man in the business was now more or less under the rule of the Society. Under these circumstances, therefore, they had clearly a right to know what were the proceedings of the Council. Again, without such knowledge the election of members was but a farce, as had been truly said, and might just as well be done by drawing lots. The candidates were unknown except by name to the members at large, and he had been surprised sometimes at the ignorance even of well-known names amongst provincial members. It was also due to the members of the Council that their proceedings should be known; and he was convinced that when this was the case, which he knew it would be, they would be encouraged by finding the members at large take more interest in the affairs of the Society, and attend its meetings in larger numbers than had been the case hitherto. Allusion was made in the report to certain provisions in an Act of Parliament relative to the storing of petroleum, which had escaped the attention of the Council; this oversight was excusable under the circumstances, but it would be much better to appoint a sub-committee to watch all such matters, and take action upon them immediately, than leave it until a new Bill was necessary to remedy the defects of the first.

Mr. PEDLER said it was absolutely necessary that some change should take place, but he thought it should go much further than the resolution proposed, and that a report of all that passed at the Council meetings should be published. As had been said, the Council was a representative body, and he did not think the constituency would be satisfied with less than a full report of the proceedings. If this course were adopted, he was convinced that the Council would stand higher than ever in the public esteem; and those members who worked day by day and week by week for the good of the Society would receive the credit which legitimately belonged to them. He should be very sorry to say a word that might wound the feelings of the most susceptible member of the Council, especially when they were met to exchange congratulations, but he thought means should be afforded to the members of judging who were the best men to elect to such a responsible office.

Mr. COLLINS thought there could be but one opinion as to the propriety of the resolution proposed by Mr. Reynolds. He very much doubted the propriety of having a reporter present at the Council meetings, but thought the minutes taken by the Secretary, when confirmed at the following meeting, might be reported in the Journal.

Mr. MANBY (Southampton), as a very old member, desired to endorse every word that had fallen from Mr. Vizer. The present system of voting was a

complete absurdity, for he did not know a single member of the Council except Mr. Randall.

Mr. RICHARDSON agreed with the resolution entirely, but not with all that had been said about voting, since the younger members of the Society, at any rate, who had been up to London to pass their examination, were not entirely ignorant of the qualifications of the candidates.

Mr. REYNOLDS asked if Mr. Pedler could not support the resolution as it stood, with the addition, if desired, of the word "monthly" to make it more definite. He desired to leave all details as much as possible in the hands of the Executive.

Mr. PEDLER said he had no desire to cause a division; he was only anxious to make the thing complete.

Mr. SQUIRE said that if the votes on all questions were reported, they would be very long reports of very unimportant matters. There could be no objection to the votes on all important matters being published.

The CHAIRMAN remarked that if the whole of the minutes taken by the Secretary were published, they would fill the Journal.

Mr. RANDALL, although a member of the Council, saw no reason why he should not give his opinion upon this most important matter. It was highly desirable that all votes of any importance should be published, but if there were no discretion, some very awkward things would sometimes appear. He suggested therefore that it should be left in the hands of the Council, who he was quite sure would take care that information should be afforded as to all substantial matters, and as to who of their number worked and who did not, so that they would be able to vote accordingly on future occasions. There were, however, many personal matters constantly coming before them, some with reference to the Benevolent Fund, some to persons alleged to be improperly on the register, which it would be very undesirable to publish, and indeed if such a course were adopted, it would at once put an end to all freedom of action and of speech. He thought the meeting might be quite satisfied to leave the matter in the hands of the Council to do what was right.

Mr. EDWARDS quite agreed with what had been said by Mr. Randall. For some years he had been of opinion that a fuller report of the proceedings of the Council was desirable, but still it was a matter which ought to be left in the hands of the Council themselves, or else in some cases serious consequences might ensue. Even in the case of parliamentary reports, the House of Commons had had to interfere on more than one occasion to prevent actions for libel in consequence of what had been said, and to take another instance, the Senate of the United States frequently sat in secret session. The Council would have but one desire, to give the fullest information possible of what was done.

Mr. BOTTLE was of the same opinion as Mr. Randall and Mr. Edwards. He quite agreed with Mr. Reynolds that the members should have fuller information, but they must proceed cautiously and step by step; if the proceedings were fully reported, the size of the Journal would be quite inadequate, and he thought the Council would be quite disposed to do all that was really desirable.

Mr. BRADY said there were difficulties in almost everything, but he should not like the meeting to break up without expressing an opinion upon the resolution which had been proposed.

Mr. HILLS did not see where the difficulty lay in the present case. He should support the resolution.

Mr. STODDART (Bristol) said he had had many opportunities as local secretary of learning how acceptable to provincial members would be such a measure as was contemplated by the resolution.

The CHAIRMAN then put the resolution (the word "monthly" being added), which was carried almost unanimously.

The following gentlemen were then elected scrutineers:—Messrs. Greenish, Wilson, Gulliver, Radermacher, Young, Tibbs, Coles, Westrup, Kettle, Ward, Whitfield, Quiller.

Mr. HILLS said he wished to make a short statement with regard to the portrait of Mr. Jacob Bell, before the meeting separated. The engraving was now ready, and he proposed to sell artist's proofs on india paper at three guineas, proofs in the second state at two guineas, and the engravings at one guinea. He had paid the whole of the expenses, and the whole of the money raised by the sale would be devoted in some shape to the educational department of the Society. His attention had been drawn to the noble use which her Majesty the Queen had made of the £2500 which had been realized by the sale of 'Leaves from Her Majesty's Journal,' and he did not think he could do better than follow her example, which would, indeed, be a royal road if it led to a good result. Whatever might be the sum realized, it would be placed at the disposal of the Society; and he trusted that Mr. Bremridge, who had kindly undertaken to receive the names of subscribers, would soon have a long list of those who desired to possess a portrait of the late Mr. Jacob Bell, painted by Sir Edwin Landseer, and engraved by his talented brother Mr. Thomas Landseer.

Mr. MACKAY suggested that it would add greatly to the value of the portrait if Mr. Hills could obtain a facsimile of Sir Edwin Landseer's signature to attach to the proofs in the opposite corner to that which bore the signature of the original. He begged to propose a cordial vote of thanks to Mr. Hills for his great kindness and liberality in this matter.

Mr. HILLS said he was very gratified at having been able to please the members of the Society so much, and he hoped all present would not only give their applause but their names. He would endeavour to obtain not only the facsimile but an original signature by Sir Edwin Landseer to all the India proofs.

Votes of thanks were then passed to the President and Secretary, and the meeting adjourned to Friday, the 21st, for the declaration of the poll.

PRESENTATION TO MR. SANDFORD.

On Wednesday, May 19th, a very numerous gathering of the members of the Pharmaceutical Society took place in the Lecture Hall of the Society's house, Bloomsbury Square, to witness the presentation to George Webb Sandford, Esq., President of the Society, of an elegant assortment of plate, value 200 guineas, as the first instalment of a testimonial which has been raised in commemoration of that gentleman's indefatigable exertions in connection with the passing of the Pharmacy Act; the balance of the fund raised, which amounts in the whole to upwards of £500, being devoted to the painting of a portrait, by an eminent artist, of Mr. Sandford. The plate, supplied by Messrs. Lambert, of Coventry Street, consists of a set of four side-dishes, with covers and warmers; four candlesticks; a case of fish knives and forks; and a large salver, bearing the following inscription:—

"PRESENTED, WITH OTHER PLATE, VALUE 200 GUINEAS, TO GEORGE WEBB SANDFORD, ESQ., PRESIDENT OF THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN, IN GRATEFUL ACKNOWLEDGMENT OF HIS UNWEARIED EXERTIONS IN THE CAUSE OF PHARMACY, AND IN COMMEMORATION OF THE PASSING OF THE PHARMACY ACT OF 1868. 19TH OF MAY, 1869."

The chair was taken by Frederick Barron, Esq., Chairman of the Testimonial Committee, who, in opening the proceedings, said he felt that a great honour had

been conferred upon him in selecting him for the position which he then occupied. Then, turning to Mr. Sandford, he said :—Mr. President, I have been requested by the subscribers to this testimonial fund, which I think amounts to something over £500, to beg your acceptance of this service of plate. There is to be a portrait, which I am sure, from the gentlemen who have been selected to make choice of an artist worthy of the work, will be a painting that will represent you very favourably. I now beg your acceptance of this plate, as a feeble recognition of the very great services you have rendered to the members of the Pharmaceutical Society and the whole trade. I am sure that all present fully recognize with me that through your energy and untiring perseverance you have been the instrument in securing the passing of the Pharmacy Act of 1868. We know that your heart has been thoroughly in the work, and that your very bright intellect has been exercised on behalf of all the members of the trade, who will hereafter reap the benefit. I pray that your life may long be spared to enjoy the use of this plate, to see your friends around you, and to tell them how highly you have been respected and esteemed by the members of the Society of which you are the highly-distinguished President, and by every chemist and druggist throughout the country. I am sure that all members of the wholesale and retail trade, whether absent or present, reflect the sentiments which I feel, and which I have endeavoured feebly to express. May the Almighty bless you here, and reward you in a brighter and better world hereafter.

Mr. SANDFORD then rose, amidst immense cheering, which for a long time prevented his being heard. When silence was restored, he spoke as follows :—Mr. Chairman and Gentlemen : when you spoke of the honour of presenting this plate to me, I certainly thought the honour was all the other way, for I feel it a great honour to receive such a gift at your hands. I must confess that I was greatly surprised, and almost overpowered, by the magnificence of this display. When I first received an intimation from Dr. Attfield that a resolution had been passed at Norwich by the Pharmaceutical Conference, declaring that some public recognition should be made of my poor services, I never for one moment expected that it would assume such a form as this. It is indeed magnificent ; I admire it in itself, for "a thing of beauty is a joy for ever," yet it is not for its beauty that I principally value it. I value it as an expression of your feeling, as a confirmation of my own opinion, that the Act which I have endeavoured with the assistance of others to obtain will be for the benefit of our body generally. There are certain ideas associated with it which will always be present to my mind. It will not be necessary for me to tell my friends that I am respected ; that plate will speak for itself. It is inscribed on every piece of that plate, just as legibly as if by a graver, that I have your approval of the course which I have adopted, and your confirmation of the opinion that the Pharmacy Act will work well for the general benefit. But, Sir, I claim no separate merit for this work. In the last article which was published in the Journal in Jacob Bell's lifetime, I find this :—"*All that remains to be accomplished is the more direct recognition of the Society by Act of Parliament, by such an extension of its powers, under proper control, as may enable it to bring to an early and successful completion the work which has already made satisfactory progress, by which means pharmacy will be fully established in its proper position, in the hands of persons duly qualified and entitled to the confidence of the public.*" That, gentlemen, was, I believe, the last article written by Jacob Bell, and that has been my text. I have stuck to it, even when some of my friends have thought me obstinate. I determined, if possible, to carry it. You may remember that the Medical Council put forth a proposition that dispensing chemists should be under the control of that body. I took it as a compliment that the Pharmaceutical Society was recognized in this proposition, but the great fact was that it was put forth by such an authority, that it was necessary for the good

of the public that pharmacists should be educated and well-qualified men. You know, gentlemen, that at that time we were not altogether united, there being several points on which the Pharmaceutical Society was not in unison with chemists outside. It has been one great object with me to remove those differences. You know that when we brought forward our Bill in 1865, we failed; and why did we fail? Simply because there was not union between the chemists and druggists who were to be benefited by that Bill. It was one of my chief objects to remove that difference, and I think I did remove it, and I see here now many men who, at that time, were called outsiders; we have given up the term now; there are no outsiders now. I have been assisted very greatly in all this by the members of the Council, and, therefore, although you give this testimonial to me, your thanks are equally due to them. I disclaim any special merit of my own, but I happened to be in that position which made me, as it were, the leader of the Council, they having done me the honour to elect me their President, and it is to that circumstance that I am indebted for this magnificent testimonial. I do not know how sufficiently to express my thanks; but I am told I shall have to speak again by-and-by, and then I may be able to say,—as men do sometimes after dinner,—"This is the happiest moment of my life." I do not like to indulge in extravagances, but there certainly never has been a moment in my life when I have felt prouder than I do at present.

Mr. MORSON proposed a vote of thanks to the Chairman for his ability in presiding on the happy occasion, which was seconded by Mr. DEANE, and carried by acclamation.

The CHAIRMAN briefly returned thanks for the compliment, and the meeting then separated.

COMPLIMENTARY DINNER TO MR. SANDFORD.

The above event, which has been looked forward to for some time, took place on Wednesday evening, May 19th, and passed off with great *éclat*, the number of guests being 103. The chair was occupied by Frederick Barron, Esq.; Mr. Evans, Vice-President, and Mr. Hills, Treasurer of the Pharmaceutical Society, officiating as Vice-Chairmen, and the post of honour on the right of the Chairman being occupied by Mr. Sandford. The dinner was served in the style for which the Freemasons' Tavern Company are so famous, and gave great satisfaction to all the guests. Grace having been sung by Messrs. Lester, Montem Smith, Chaplin Henry, and J. L. Hatton, who also added to the enjoyment of the evening by several glees and songs,

The CHAIRMAN proposed the health of "The Queen," followed by the toasts of "The Prince and Princess of Wales and the rest of the Royal Family," and "The Army, Navy, and Volunteers," which were all received in the usual enthusiastic manner.

Mr. SAVORY being called upon to respond to the last-mentioned toast, said he had not at present the honour of belonging to either of the services named, but when he was a volunteer he knew that the appreciation of the public was highly prized by all his comrades as well as by himself, and therefore, as the public enthusiasm on the subject had to some slight degree cooled down, the warm manner in which their health had been received would be additionally welcome.

The CHAIRMAN then rose to propose the toast of the evening, the health of George Webb Sandford, Esq., who had been for six years President of the Pharmaceutical Society of Great Britain. He had that morning had the high

honour of presenting to him a testimonial which had been purchased out of part of the fund of £500, or rather more, which had been collected by the friends of the Society. He had commenced his work with a considerable degree of nervousness, not being accustomed to public speaking, but was encouraged by seeing very clearly from the countenances of his audience, that the President was a general favourite, and there was no doubt that he fully deserved the high opinion in which he was held. He had laboured hard for the cause of pharmacy, and particularly for the Society of which he was President, and his labours had been crowned by the passing of the "Pharmacy Act," for if he had not carried the Act himself, he would defy any one to say that he had not been mainly instrumental in obtaining it. He was quite aware that in that matter he had been backed up by very talented men; men industrious, intelligent, clever, good speakers, men who thoroughly knew their business, and who had worked very hard in this labour of love. As a wholesale druggist, he felt that the whole trade was being gradually raised to a condition of greater respectability. He did not wish to refer to what druggists were some thirty years ago; but there was no need to disguise the fact that at that time they were in many parts of the country in a state of lamentable ignorance. At the present time, however, the Pharmaceutical Society was training up a body of clever, well-educated men, who would be a credit to any country, and there would now be no longer any chance of people being poisoned through the ignorance of chemists. The Pharmaceutical Society had gone on exceedingly well, both under the present President and those who preceded him, but now they were advancing with very rapid strides indeed, and he could only hope that the members might always continue as united as they had been. He did not think that the Bill was as perfect as it might have been, but he had great faith in their talented President, in their clever professors, and in their indefatigable and excellent Secretary, nor must he forget the Treasurer, Mr. Hills. The accounts were certainly kept in so admirable a manner that the audit seemed almost a work of supererogation, but it was an opportunity for a pleasant meeting at any rate. He felt his inability to discharge worthily the duty which had fallen upon him, but he had much pleasure in proposing the health of their friend Mr. Sandford, with the fervent hope, in which he was sure all present would join, that he might live long to enjoy the blessings of health and prosperity, and the good opinion of the whole trade.

The toast having been drunk with three times three cheers,

Mr. SANDFORD rose to reply. He said he was almost afraid to get upon his legs after what had been said by his friend Mr. Barron, lest too much should be expected of him. The events of the day had been something marvellous, and little did he think when elected President of the Society six years ago, that he should ever see such a day as this. He felt altogether unfit for the office, but he might now venture to hope, and he felt sure from the kind manner in which he had been received, that his friends were of opinion, that the general affairs of the Society had not suffered in his hands. There was one point, however, to which he had from the first given special attention, and that was legislation. He seemed to have a notion that the Society's work would not be complete until there was some extension in that direction. He watched for an opportunity to obtain that extension, and it soon came, in the proposal of the Medical Council that dispensing chemists should be examined and placed under the control of that body. That was a step in advance for the cause of pharmacy, but the Pharmaceutical Society was capable of conducting such examinations, and he saw no necessity for the Medical Council taking charge of them. Owing to the exertions of Jacob Bell, a Society existed well qualified, not only to educate and examine, but to take charge of all matters connected with pharmacy, and for that reason he considered they ought to remain independent.

No doubt they would have been attached to a very honourable profession, but they would in that case have been only like a minnow among the whales, and he thought they were much better by themselves. Almost on the day, therefore, on which he read the proposal of the Medical Council, he drafted his first Bill for the extension of the "Pharmacy Act" of 1852; that Bill he introduced to the Council, who approved of its principle, and it was now, in all its essential features, the law of the land. Certain alterations and additions had to be made,—for instance, the poison clauses; and though some members were under a little apprehension with regard to some of these provisions, he believed it would be found that there was no real difficulty in working them out. He should not have done all this had he not been well supported by the members of the Council, who, seeing he wanted help, assisted him most earnestly and manfully all the way through. And not only so, but he had received valuable help from many who were not members of the Society. Mr. Barron had spoken of union, and it was probably for want of that that they lost their Bill in 1865; now he believed they had carried a Bill which would satisfy all parties. It was a measure which would lead to a great advance in pharmacy; if any one visited the house in Bloomsbury Square, they would now find the library, lecture rooms, and laboratory full, and the Board of Examiners were almost worked to death. As no man could in future commence business without passing an examination, there could be no doubt that the status of pharmacists would be improved. It was every man's duty, and it should always be his pleasure, to do all in his power to advance the order to which he belonged. He felt that he had succeeded in so doing, but it was only because he had been favoured with such efficient helpers. He trusted that the unanimity which now existed would continue; they were gathered under the roof of the Freemasons' Hall, and though not a mason himself, he believed there was no body of men more thoroughly united together, and hoped that some of their spirit would be communicated to this Society. There was need for caution and moderation in their proceedings, in order on the one hand that no one should be able to complain of illiberality, and on the other hand that the public should have no ground for complaining that the Pharmaceutical Society did not do their work well and honestly. He concluded by thanking his friends most heartily for their kindness, and sat down amid renewed applause.

Mr. H. Sugden Evans proposed "The Medical Profession," which comprised a body of gentlemen with whom, both as citizens and in business, they were on the most friendly relations. A harder-worked class of men, or one more ready to make sacrifices for their fellow-creatures, was not to be found anywhere, and their bravery at the call of duty at least equalled that shown in either the army or navy. Such were the men whose health he proposed, and he would couple with the toast the name of Dr. Alexander Silver. He had come amongst them to do honour to their President, who had been the means of bringing into existence the Pharmacy Act, which, he believed, would tend to draw the line more distinctly between the medical and pharmaceutical professions, and be the means of preventing those jealousies which sometimes existed. The medical profession, he was sure, now feel that pharmacists were men fully capable of carrying out honestly and efficiently their instructions, and would therefore feel confidence in placing their dispensing in the hands of the chemists, and no longer do it themselves; and, on the other hand, the pharmacist, feeling that this confidence was reposed in him, would no longer have any inducement for prescribing across the counter. He hoped, therefore, that the event which they were that evening commemorating would cement more strongly than ever the bond of union between the medical profession and pharmacists; and, in the firm belief that such would be the case, he begged to propose "The Medical Profession."

Dr. Alexander Silver, in responding, said, that if he did not worthily represent the medical profession, certainly no one esteemed more highly the Pharmaceutical Society, and its professors, examiners, and members, several of whose names were well known, not only to the medical profession, but all over the world. He need not say a word as to the value of the Society, but with its aims and objects he most cordially sympathized, for it was always praiseworthy in any body of men to try and obtain a well-defined position. He was sorry to know that between certain branches of his own profession and pharmacists there was an ill-grounded feeling of jealousy, but this was not felt by the more worthy and noble-minded members, who fully shared in the desire to separate pharmacy from medicine, and to make them two distinct professions. If a man desired to be a pharmacist, he could not at the same time be a well-qualified physician; excellence in the two branches was incompatible. Furthermore, he esteemed the Pharmaceutical Society on account of the singlemindedness of its aims, for, notwithstanding its enormous influence and high position, it had never descended to use that position for the purposes of trade, which could not be said of all analogous bodies. The liberality of the Society also was most noble, the ample resources of their well-stocked library and laboratory being always at the service of any one who really required information; and, in addition, he could speak from his own experience that valuable assistance was forthcoming when necessary in the tedious and sometimes costly researches which medical men were from time to time called upon to engage in with reference to various medical agents

Mr. Randall (Southampton) said he had an easy task to perform in calling upon the company to drink "Success to Pharmacy," inasmuch as the great majority of those whom he saw around him were engaged in it as their daily occupation; and therefore, thinking of success only in a business point of view, there was no fear of the toast meeting with ready acceptance. He would, however, go beyond that, and propose success to pharmacy as an art. If it were true that for all the ills which flesh is heir to God had sent a remedy, it must be a noble thing to search out these remedies, and present them in a convenient form for use. Still further, he would propose success to pharmacy as a science, for surely it was a noble thing, entirely apart from pecuniary or utilitarian considerations, to search out the wonderful way in which nature, in her own laboratories, elaborated the various articles with which they had to work. They could all remember the time when pharmacy was looked upon with some discredit, and when the public felt that they required more protection; but it was not so now, for he believed that it would now be considered a credit to belong to such a body. They might still, however, propose success to education in pharmacy. A peculiar education was required for success in pharmacy, and that could now be obtained not only at the Pharmaceutical Society; but they must still go forwards, and each one, as he drank the toast, determine within himself that, from that day forward, he would strive, by every means in his power, to raise the status of the profession to which he belonged, not for his own advantage only, but for that of the general body of the public, to whose necessities they ministered. Their motto must still be "Excelsior," and they must endeavour to cultivate the professional spirit which would make them look upon their fellows not so much as rivals but as friends. Success, then, to pharmacy, not wistfully or even hopefully, but determinately, and in that spirit there could be no doubt as to the result.

Mr. Deane, being called upon to respond, said he had found some of the greatest pleasures of life in connection with the business to which he was devoted; and he would venture to suggest that all those who had young men

committed to their care, should, from the beginning, endeavour to inculcate upon them the principle, that if they would be successful they must find their pleasures and concentrate their interests in the various articles to be found in a druggist's shop. He knew of no business so full of interest; even in the smallest village shop there would be perhaps five hundred articles, the nature, properties, and history of which would afford ample scope for the most inquiring mind. It had often been to him a matter of surprise that so few druggists, comparatively speaking, seemed to have any idea of the beautiful objects of contemplative study which were to be found upon their own shelves. Since, however, he had commenced his career, there had been a great change in the facilities for study. At that time there was no means of acquiring knowledge except by books, and even these were scarce, and could not be obtained except at immense cost. Since then, however, the movement had taken place, commenced by Jacob Bell, and followed up by Dr. Pereira, Professor Redwood, Professor Bentley, and others, up to the time when their esteemed President had succeeded in passing the Pharmacy Bill. Nevertheless, with all the exertions of these talented men, who had shown so strong a desire to promote the interests of pharmacy, their success would have been very limited but for the individual exertions of many men engaged in the business. Their co-operation was still necessary, and he would remark that the same interest still attached to the business of a chemist as did when he was a boy; the druggist still had the same things around him in which, from the knowledge of them which he was now required to possess, he might be expected to take a pleasurable interest. He hoped, therefore, that every one would, as far as possible, endeavour to take advantage of the field of study that lay before him, and take especial care to avoid adulterations (which were now, he believed, very scarce) and inferior qualities, the use of which would never, in the result, produce advantage of any kind.

Mr. Joseph Ince proposed "Success to Pharmaceutical Education." He said that if he were unable to do justice to the toast it was not from any lack of interest in it. In connection with the Society was a Benevolent Fund,—a splendid charity,—but he could not help feeling that they had *two* benevolent funds, for what could be more truly benevolent, or an act of grander charity, than to give a man a dowry of sound knowledge? In former days there had been a great deal said about the *status* of the chemist, and writers and speakers made many and various suggestions for giving the profession a *status* worthy of it, but if they had gone on in the old-fashioned, ignorant manner in which, he was sorry to say, they did for many years, they never would have had any position at all. But this was what education had done for them, for the only way ever to obtain a status was to make it for yourselves. Those who, above all others, were entitled to the credit of having brought about the present state of pharmaceutical education were the founders of the Society; they sowed the field which was now being reaped by their successors. They were not likely to forget the cause of pharmaceutical education, when they saw amongst them one who had done as much if not more than any other to promote it, Professor Redwood. He could never forget the pleasant year he spent when studying under that gentleman, and working side by side with one who was now at a distance, but was then his associate. He wished to avoid everything fulsome, but he must say that had it not been for Professor Redwood the present system of education would have been kept back immensely.

Dr. Redwood said it could not but be gratifying to any one to be associated with such a toast as that just proposed, but more especially when proposed to such an assembly and on such an occasion. They were met to commemorate the practical result of the application of pharmaceutical educa-

tion, for as Mr. Ince had very properly said, to education alone were they indebted for their present position. The subject of education was one of the most interesting and increasingly important in the present day. Many amongst them could recollect when education generally was much discussed, and when it was not at all a decided point whether it improved the condition and added to the happiness of those to whom it was given, and whether its general diffusion would tend to the advantage of the public. The importance of education was now no longer questioned, but still there were differences of opinion as to the kind and extent of it which should be imparted in given cases, and this applied not only to the question generally but also to education in connection with pharmacy. When education was commenced by the Pharmaceutical Society, the question, *cui bono?* was frequently asked, and a great many practical men—perhaps at one time the majority—would look rather shyly upon a young man who had been educated in Bloomsbury Square, fearing lest he should be above his business. Experience in this particular case, however, had led to the same result as in the wider field of education generally, and it had been gradually acknowledged that the benefits resulting from systematic scientific education were quite as apparent in the case of a pharmaceutical student as in any other. It was, therefore, no longer a question as to the fact, but simply as to the extent to which education should be carried; and this undoubtedly was and always must be a very important question. There would always be room for differences of opinion as to the kind of education best suited to make young men good and efficient pharmacists, and upon that question, therefore, he would not, on such an occasion, enter. But there was one view of the subject to which he must allude, and he would ask, What is pharmaceutical education? Was it not a grand source of power? Might they not be almost said to be creating a new estate in their realm by putting pharmacists in possession of it, and would not some means be required for directing and controlling this power? As chemists they were not unaccustomed to the consideration of forces existing undeveloped in many substances, and not unfrequently by accident or design, were forces produced which seemed utterly beyond control. This had been much impressed upon his mind on the previous evening when, passing through the Museum with a friend, they stopped for a moment before a small bottle containing picrate of potash, a very harmless-looking substance, but of the power of which a very appalling exhibition had recently been given in France. In conclusion, Dr. Redwood returned thanks most cordially for the compliment which had been paid him, and ventured to express a hope that he might be able to devote many years more to the cause of pharmaceutical education.

Mr. Sandford next proposed the health of the Chairman in appropriate terms.

The Chairman in thanking the company for the cordial manner in which they had received the toast, bore testimony to the steady advance in position and influence made by the Pharmaceutical Society, and begged to apologize for having in its early days spoken coolly of it. He then alluded to the Benevolent Fund, as being one of the most pleasing portions of the Society's operations, and claimed for it the further support of members under present altered circumstances.

Mr. Bottle proposed the health of the Treasurer of the Testimonial Fund, Mr. Orridge, who had discharged his duties with the zeal and ability which characterized him in all the actions of life, more especially in his efforts on behalf of the Benevolent Fund, for which he had done as much as nearly all the rest of them put together.

Mr. Orridge in reply said he should be very glad to do anything for the

Testimonial Fund, but in reality he had only been called upon to take care of the money when it had been obtained by others. The real work had been done by the Secretaries, Messrs. Matthews, Carteighe, and Mackay, whose healths he begged leave to propose.

Mr. Carteighe and Mr. Matthews having briefly responded,

Mr. Mackay said he had been much surprised to find his name proposed as one of the Secretaries to the fund at the preliminary meeting held in October last, but he supposed it was done in order that some one connected with the North should be associated with the testimonial to their worthy and esteemed friend and President. He was only sorry that he had been unable to do more, but he had done what he could, and the subscription-list must tell its own tale. If the names were few, and if the sums appeared small, the name of Mr. Sandford was not unknown or unrecognized in Scotland, and if he ever visited that part of the kingdom, he was sure that actions would testify to this more powerfully than any words of his could do.

Mr. Haselden proposed the health of "The Committee," coupled with the name of Mr. Howden.

Mr. Howden in reply, said the services rendered by the Committee on this occasion had been a labour of love. To a man, they loved the Pharmaceutical Society, and felt convinced that a most important and useful future lay before it. Lord Bacon said of men of science that they were the ministers and interpreters of nature, and pharmacists might be called the ministers and interpreters of the divine art of healing the sick, and they were now called upon in an especial manner to show the Government and the public that they were properly qualified to discharge the onerous duties entrusted to them. Notwithstanding the lateness of the hour, he could not sit down without briefly alluding to the valuable services rendered by their esteemed President; he had sacrificed time, social pleasures, and even commercial prosperity, for the benefit of the Society and the vocation to which he belonged. The testimonial which it was their honour to present to him must be looked upon therefore, not as the quittance of a debt, but simply as an expression of that gratitude which they could never sufficiently express. But their labours were not yet completed, for they had to discharge the very difficult duty of selecting an artist to paint a portrait of their President, which should be worthy to adorn the walls in Bloomsbury Square. They would be fortunate if they could find an artist combining within himself the excellences of Rubens and Vandyke, Sir Joshua Reynolds and Sir Thomas Lawrence; but as this could hardly be expected, they must by anticipation ask the indulgence of the subscribers. They would do their best, and hoped that a gentleman would be found worthy to paint a companion portrait to that of Mr. Allen, their first President.

Mr. Pass proposed the health of "The Visitors," remarking that it was very gratifying to see so many gentlemen not directly connected with pharmacy anxious to do honour to their President, and to his exertions in connection with the Pharmacy Bill. In connection with the toast he would name Dr. Spurrell and Mr. Flux, whose legal knowledge had been of great service in the preparation and passage of the Bill.

Dr. Spurrell having acknowledged the compliment paid him,

Mr. Flux also expressed his sense of the honour done him. He said they were met to congratulate one another upon the victory which had been achieved, but he might remind them that it had not been won without great labour and hard fighting, for which Mr. Sandford deserved all the thanks which they had given him. Having in some measure shared his labours, he could bear testimony to the great and unceasing exertions required to bring about the desired result. He would remind them that the Society was still

but young, and might be all the more congratulated on having attained such an honourable recognition at the hands of Government. He did not, however, consider the present Bill perfect by any means, or that the Society had yet accomplished all the good which it was destined to accomplish. He would ask them, therefore, to look at what had already been done as an encouragement to future efforts; what had been done had been done by unanimity, and he hoped this feeling would never be wanting in the Pharmaceutical Society.

Mr. Mackay, in proposing the health of the Vice-Chairmen, Mr. Evans and Mr. Hills, said he was reminded of the story of a veteran soldier who was deputed by his regiment to present their captain with a testimonial which had been raised in his honour. The subscriptions of the men had been expended in the purchase of a silver jug, with which the old soldier advanced before the assembled regiment on the parade-ground to make the presentation. Although a brave man and an experienced soldier, he was by nature of a modest disposition, and, on approaching his officer, words failed him, and he was only able to ejaculate "Here's the jug." He (Mr. Mackay) was much inclined to follow this example, and simply say, "Here are the men," and both gentlemen were so well known that little more was necessary. As a man approached the shady side of life, nothing was more pleasing than the reminiscences of youth; and, in his own case, nothing he looked back to gave him more gratification than the time he passed some thirty years ago in Oxford Street, in company with Mr. Hills. The friendship then commenced had been cemented more strongly by succeeding years; and at that moment still retained all its pristine freshness. But, though he had spoken of Mr. Hills as his own particular friend, he could also bear testimony to his zeal in the cause of pharmaceutical education, to prove which he need only go back a few hours, and refer to the munificent gift he had made to the Society of the portrait of Mr. Jacob Bell. Mr. Evans also was well known to them all from his unwearied exertions as Vice-President of the Society, and he might yet live to attain a still higher position amongst them.

Mr. Hills, in responding, said he could repeat with even more truth of Mr. Mackay, all the compliments which he had paid to him. Coming at the close of the evening, almost every topic had been exhausted, and he had only one suggestion to make, that they should hold a pharmaceutical dinner every year. He believed such a course would conduce, not only to good fellowship amongst themselves, but also to the public good. In conclusion, he must propose the health of a gentleman whose labours had been great during the past year, but who was always ready for any amount of work for the benefit of the Society. He referred to their indefatigable Secretary, Mr. Bremridge.

Mr. Bremridge said the honour he had received was quite unexpected, and after all the hard work that Mr. Hills had alluded to, he should have much preferred remaining silent. However, he thanked the meeting most cordially for their good opinion, and assured them that no endeavour should be wanting on his part to deserve their esteem.

ADJOURNED MEETING.

Friday, May 21st, 1869.

MR. GEORGE W. SANDFORD, PRESIDENT, IN THE CHAIR.

The Scrutineers brought up their Report, as follows:—

We, the undersigned Scrutineers, appointed at the Twenty-eighth Annual General

Meeting of the Pharmaceutical Society of Great Britain, do hereby certify that we have examined the voting-papers committed to us, and report the following results:—

Council.

Voting-papers received 935
Disallowed 78

857

Ince 736	Carteighe 640	Dymond 536	Maltby 283
Sandford ... 717	Evans 623	Bourdas 478	Breton 220
Brady 707	Haselden 608	Standring 468	Andrews 211
Mackay 692	Morson 607	Gissing 422	Hornsby 184
Hills 659	Stoddart 592	Betty 393	
Deane 652	Bottle 565	Palk 295	

Auditors.

Voting-papers received 790
Disallowed 8

782

Barron, Frederick 607	Squire, William 692
Hodgkinson, William 731	Westwood, Robert 535
Mackey, John B. 668	Turner, Charles E. 359

THOMAS GREENISH, *Chairman.*

EDWARD WILSON.	JOSEPH B. WESTRUP.
WILLIAM GULLIVER.	JOSEPH KETTLE.
C. J. RADERMACHER.	FRANCIS WARD.
R. F. YOUNG.	JOHN WHITFIELD.
FREDERICK TIBBS.	C. R. QUILLER.
CHARLES COLES.	

The Chairman then declared the Council and Auditors for the ensuing twelve months to consist of the following Members:—

Council.

ABRAHAM, JOHN, 87, Bold Street, Liverpool.
BOTTLE, ALEXANDER, 37, Townwall Street, Dover.
BOURDAS, ISAIAH, 7, Pont Street, Belgrave Square.
BRADY, HENRY BOWMAN, Mosley Street, Newcastle-on-Tyne.
CARTEIGHE, MICHAEL, 172, New Bond Street.
DEANE, HENRY, Clapham.
DYMOND, GEORGE, 17, Bull Street, Birmingham.
EDWARDS, GEORGE, Dartford.
EVANS, HENRY SUGDEN, 60, Bartholomew Close.
HASELDEN, ADOLPHUS FREDERICK, 18, Conduit Street.
HILLS, THOMAS HYDE, 338, Oxford Street.
INCE, JOSEPH, 26, St. George's Place, Knightsbridge.
MACKAY, JOHN, 119, George Street, Edinburgh.
MORSON, THOMAS N. R., 38, Queen Square, Bloomsbury.
ORRIDGE, BENJAMIN BROGDEN, 32, Ironmonger Lane.
RANDALL, WILLIAM BRODRIBB, 146, High Street, Southampton.
SANDFORD, GEORGE WEBB, 47, Piccadilly.
SAVAGE, WILLIAM DAWSON, 30, Upper Bedford Street, Brighton.
SQUIRE, PETER, 277, Oxford Street.
STODDART, WILLIAM WALTER, 9, North Street, Bristol.
WILLIAMS, JOHN, 5, New Cavendish Street.

Auditors.

BARRON, FREDERICK, 2, Bush Lane, Cannon Street.
HODGKINSON, WILLIAM, 127, Aldersgate Street.
MACKEY, JOHN B., 15, Bouverie Street.
SQUIRE, WILLIAM, 5, Coleman Street.
WESTWOOD, ROBERT, 16, Newgate Street.

In answer to a question respecting the disallowed votes, the Chairman of the Scrutineers stated that in some voting-papers more than the proper number of names were left, that some Members had omitted to identify the envelope with name and address, as required by the bye-laws, and others had been transmitted by post, and received by the Secretary after the 17th instant.

The Scrutineers also handed to the President their Report of the returns for the election of Local Secretaries.

Votes of thanks having been passed to the Scrutineers and to the Chairman, the meeting terminated.

PROVINCIAL TRANSACTIONS.

ASHTON AND DUKINFIELD CHEMISTS' ASSOCIATION.

In consequence of the passing of the "Pharmacy Act," it was thought desirable by the members of the trade in this neighbourhood to form an Association to watch their interests, to promote social feeling and goodwill among the members, and also to provide, as far as possible, means of education in the varied sciences connected with the business for the assistants and apprentices. An Association has been formed for Manchester and district, in which most of the Ashton chemists are enrolled, and arrangements were made with the principal of Owens College for a course of lectures, which have been most successfully carried out during the last few months. More complete arrangements have now been entered into for the forthcoming autumn and winter session. To give the young men all the assistance possible, and to make the arrangements with Owens College successful, is one of the aims of the Association formed for Ashton and Dukinfield. At the first meeting Mr. W. H. Waterhouse, the oldest member now in business, was appointed President; Mr. W. Bostock, Vice-President; Mr. Samuel Neal, Treasurer; and Mr. Edwin Fisher, Secretary.

On Thursday evening, May 30th, Mr. W. H. Waterhouse, to celebrate his thirtieth year of business, and also to inaugurate the newly-formed Association, invited all the members of the trade, principals, assistants, and apprentices in Ashton, Dukinfield, Stalybridge, Oldham, and Hyde to a social gathering in the Mechanics' Institute, Ashton. The invitation was responded to heartily, and a very influential deputation from Manchester was present. Ample provision was made; for the mind's entertainment various efforts were put forth by different gentlemen of the trade in the town, the articles collected forming quite a miniature museum. Among the chief contributors were Messrs. Mottershead, Woolley, Mather, Tomlinson, Piebold, Brown, Cockshot, all of Manchester; Messrs. Bostock, Armitage, Howarth, etc. etc. A cabinet of Materia Medica specimens was particularly attractive to the younger portion of the guests; a choice collection of flowers, contributed by Mr. Armitage, of Dukinfield; also a collection of ferns from the Kersal Moor Nurseries. After refreshments a meeting was held in the board room, presided over by Mr. J. Waterhouse, who opened the meeting with a few appropriate remarks, and then called upon Mr. W. H. Waterhouse, who read an excellent paper on the history of the drug trade in Ashton during the last thirty years. Mr. W. Bostock then read a most humorous poem of his own composition some twenty years ago, entitled, "The Druggist's Lament," which was followed by some pithy remarks by Mr. Slugg, of Manchester. Various addresses by friends from Oldham, Hyde, etc., followed, and the meeting concluded with votes of thanks to the contributors, etc., the most hearty and cordial being reserved to Mr. W. H. Waterhouse for his very liberal hospitality.

LEEDS CHEMISTS' ASSOCIATION.

The Seventh Meeting of the present Session was held in the Library of the Philosophical Hall, April 21st, at half-past eight o'clock, P.M. In the absence of the President, Mr. R. M. ATKINSON occupied the chair.

The minutes of the last meeting having been read and confirmed, Messrs. Chambers and F. Mather were elected Associates.

The HONORARY SECRETARY announced that the President had presented Evans's 'Modified Examination of the Pharmaceutical Society,' to the Library.

Mr. J. L. ROBERTS read the paper of the evening, subject "Matter;" and upon the motion of Mr. S. TAYLOR, seconded by Mr. ABBOTT, a cordial vote of thanks was given to lecturer.

A special meeting of the members was held in the Library on Wednesday, May 13, 1869. The President, Mr. REYNOLDS, in the chair.

The HONORARY SECRETARY read the circular convening the meeting, and also an apology for non-attendance from Mr. Fell.

The PRESIDENT stated that the meeting had been called in consequence of his receiving a letter from Mr. Roberts, referring to the report in the Pharmaceutical Journal, respecting the Patent Medicine Licence, he would therefore leave the subject in his hands.

In introducing the subject Mr. ROBERTS remarked, that the question of equalizing or abolishing the Patent Medicine Licence was to form the subject of a communication to the Annual Meeting of the Pharmaceutical Society, on the 19th instant; and he thought the Members of this Society should anticipate the question, so as to present, by resolution, their opinion as to the desirability of interfering with the present tariff; he therefore proposed "That this Meeting considers the present charge for Patent Medicine Licence in boroughs, viz., ten shillings, as being proper and reasonable, and deprecates any attempts to alter the same."

Mr. S. TAYLOR seconded the motion.

Mr. R. M. ATKINSON proposed, as an amendment, several clauses of a former petition in favour of the Pharmacy Act, including a suggestion that in place of the Patent Medicine Licence there should be a Pharmacy Licence at a uniform charge of 20*s.* per annum, which was seconded by Mr. W. H. RHODES.

A free discussion took place, in which all present joined. Upon the amendment being put, only the mover and seconder voted for it; the original motion being carried with only one dissentient. A copy of the resolution was forwarded to the President of the Pharmaceutical Society, to be read at the meeting referred to.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Tenth Conversazione of the Association was held at the Royal Institution on Thursday evening, April 15th. On this occasion the members were the guests of the President, Mr. J. F. Robinson, who generously provided the requisites for the evening's enjoyment. At seven o'clock the company began to arrive, and in a short time many ladies and gentlemen were promenading through the suite of rooms which contains the Museum of the Royal Institution, in which a large number of objects of interest were laid out for inspection. In the Board Room several members of the Liverpool Microscopical Association, Messrs. Abraham, Bannister, Davies, Newton, Stewart, and Wood, attended with valuable microscopes, and showed to eager observers the circulation of the blood, diatoms, the lovely effects of polarized light, etc. etc. There was also a microscope fitted with a rotating glass disk, on which were fifty microphotographs of engravings. In this room stereoscopes were also arranged, and several beautiful works of art in the precious metals from Messrs. Elkington. By permission of the Library and Museum Committee of the Liverpool corporation, Mr. T. J. Moore, the curator, exhibited the following specimens of natural history recently added to the Free Public Museum:—Vertebræ and ribs of a huge fin whale, called Steypireydr by the Icelanders (*Balænoptera Sibbaldii*, Gray), one of the largest and swiftest whales known, presented by Mr. Henry Bird, who recently read a paper before the Association, on the history and useful products of this creature; a group of the new species of birds of paradise (*Semeioptera Wallacei*), discovered by Mr. Alfred R. Wallace, at Batchian, one of the Mollucca Islands; specimens of the musk deer of Thibet, and of the musk rat of North America; and a large specimen of brain coral, of the genus *Meandrina*, brought from Annesley Bay.

In a small adjoining room, Dr. Carter presided at a spectroscope, where he produced the spectra of thallium, cæsium, and other metals.

In the Pharmaceutical Museum were models, drawings, and specimens illustrating the principal chemical manufactures of Liverpool and neighbourhood, including an extensive set of drawings and plans, and numerous specimens of raw material and products, kindly lent by Messrs. Hutchinson and Co., of Widnes, to illustrate the alkali manufacture. Amongst these were some very fine specimens of caustic soda, bicarbonate of soda, soda crystals, and soda ash. Also, samples of sulphur recovered from soda waste, by the process of M. Mond.

At eight o'clock, the President took the chair in the large Lecture Hall, and, after a few remarks, requested Mr. Keith to explain and illustrate Mr. Skaife's invention called the "Lucella," for taking instantaneous photographs. This is done by means of a flash of light produced by burning powdered magnesium. After explaining the process, Mr. Keith prepared a plate, and took a portrait of the President, which in a short time was handed round in a finished state.

Dr. Carter then gave an address on spectrum analysis, and on the application of that means of investigation to the discovery of the composition of the sun and stars.

Dr. Carter and Mr. Sharp then illuminated some beautiful vacuum tubes with a powerful induction coil, and set an electric drum in action, beaten by invisible agency.

After these varied entertainments, the company adjourned to refreshment rooms, where a most liberal supply of creature comforts was provided.

At half-past nine, the President again took the chair in the Lecture Hall, when Mr. E. Davies, F.C.S., delivered a lecture on "Hydrogenium." The lecturer gave a short *résumé* of the facts hitherto known with regard to hydrogen, and then brought forward Professor Graham's recent researches on the alloy of hydrogenium with palladium. The lecture was illustrated with experiments.

Dr. Nevins proposed a vote of thanks to the gentlemen who had provided the means of amusement and instruction during the evening, which was heartily responded to, and a most enjoyable meeting came to an end. About 400 persons were present.

Thirteenth General Meeting, held April 29th, 1869; the PRESIDENT in the chair.

The SECRETARY announced donations to the Library of the 'Pharmaceutical Journal,' the 'Chemist and Druggist,' the 'Proceedings of the Liverpool Polytechnic Society,' the 'New York Druggists' Circular,'—for which the thanks of the meeting were voted.

The SECRETARY read a paragraph in the circular calling the meeting, which stated that the question of labelling paregoric "poison" would be brought before the meeting.

Mr. SHAW said that he had made inquiries which led him to the belief that about one-half of the chemists in his neighbourhood labelled paregoric "poison." He thought that the want of uniformity in this matter was undesirable, and that it would be well if some plan could be suggested which would lead to a more satisfactory state of things. The answer of the Privy Council left the matter undecided, and he feared that the present want of system would go on until some fatal case occurred, and an inquest was held. Even if a common resolution was come to not to label it "poison," he thought it would be better than the present uncertainty, as it would tend to exonerate any chemist who might be prosecuted, by showing that he followed a universal practice.

Mr. ABRAHAM said that, as Mr. Shaw did not propose a formal motion on the subject, he showed how difficult it would be to do anything which would be practically useful. He thought that the effect of the opinion of the Privy Council would be to protect a chemist who did not label paregoric "poison;" but his own opinion was that chemists would do well rather to label substances of a poisonous nature not specified in the schedule, than to run any risk. Silverlock's label for paregoric seemed to him to meet the requirements of the case.

Mr. SHAW still thought that an unofficial recommendation of the Pharmaceutical Council would be useful, and suggested that it might be to advise the use of such a label as Mr. Abraham had mentioned.

The PRESIDENT then called upon Mr. A. N. Tate, F.C.S., to read a paper on "The Treatment of the Refuse Products of Chemical and other Manufactories, with some remarks on the Recovery of Sulphur from Soda Waste."

"In all, or nearly all, manufactures there are eliminated not only certain marketable

products for which uses have been found, and the production of which is the chief object of the manufacturer, but there are also by-products, or waste matters, for which no profitable use has been discovered, and the disposal of such products is, in most cases, a source of considerable trouble to the manufacturer, and frequently the cause of great annoyance to other people, the neighbourhoods of our manufactories being too often characterized by foul smells, filthy streams, blighted trees and herbage, and heaps of rubbish. I think that all those who have given this matter any consideration must confess that this state of things ought not to exist. The question of the treatment of the refuse products of our manufactories has not received that amount of attention it deserves, although it is one of very considerable importance, not only in a commercial point of view, but also in its relations to sanitary science, and the comfort and convenience of a large portion of the community. Still I cannot by any means say that it has been altogether lost sight of, as there have been many earnest labourers in the field. Whether successful or unsuccessful, the labours of these investigators have been productive of valuable information, which we shall do well to carefully and systematically study. Before entering into any details on any particular process or investigation there are two or three points which I offer for your consideration.

"I have spoken of refuse as being, in many cases, the source of considerable nuisance and annoyance, and in such cases it becomes a question how far legislative influence should be brought to bear upon the matter in order to prevent or abate evil. I am as jealous as any man of legislative interference with our manufactures, and would by no means advocate any extensive system of legislation which could interfere with the liberty of a manufacturer to carry on his processes in any way he thought proper, provided he did so without annoyance or danger to his neighbours or others; but there are cases where manufacturers are so thriftless, so careless, so indolent, and so reckless, that it becomes absolutely necessary that they should be compelled to do that which they ought to do without compulsion. At any rate, leaving the subject of the utilization of such products out of the question, I think it should be laid down as a general principle, that the refuse of every manufactory should be so treated, that when it is cast away it cannot become injurious to health, or in any way a source of injury or annoyance to any person. I own it is a difficult matter to arrange, but I must confess that there are cases where more extensive legislative interference would prove beneficial. We have in connection with chemical manufactures an Act of Parliament which has, I think, been in force about five years. I allude to what is known as the Alkali Act of 1863, and I believe that if those manufacturers who are affected by this Act were to be all canvassed as to their opinion respecting it, there is scarcely one who would say that it has in any way caused him injury or annoyance. On the other hand, I believe that this Act, whilst it has, to a considerable extent, protected the public from damage from the escape of large quantities of hydrochloric acid, has also proved a source of benefit to the manufacturers themselves, and much of this is owing to the wise and judicious manner in which the provisions of the Act have been carried out. I have no hesitation in saying, from what I have myself seen and heard, that the manufacturers, instead of feeling in any way injured, rather vie with each other, not only to keep the condensation within the legal limits, but to make it as complete and perfect as possible. And even as this Act has proved beneficial, so do I think that a judicious extension of it to other emanations from chemical and other manufactures would be productive of still better results, and I should look with some degree of satisfaction upon such an extension as would, at any rate, include the sulphurous and nitrous acids that escape from sulphuric acid works, and also the sulphurous smoke that emanates from copper works. Before leaving this Alkali Act, let me say that I think it affords us an example which shows the desirability of placing all matters having reference to nuisances and sanitary arrangements under the control of a body of men fitted by their education and pursuits to deal with the questions presented to them, rather than leave them, to so great an extent as we do now, to health committees and local boards. There is also another point worthy of consideration, and that is the very small proportion of processes proposed for utilizing waste products that have proved successful. I do not know, however, that this remark can apply to waste products only. If we refer to our patent lists or chemical periodicals, we find innumerable other processes that have proved complete failures, even though all the necessary elements of success appear to be contained in them. Now I think there is one thing in respect to this which, in

many instances, is the bar to success, and it is this, the want amongst chemists of sufficient knowledge of the principles and practice involved in the construction of apparatus, without which few chemical processes can be carried out on a manufacturing scale with anything like success. So much depends upon the mechanical arrangement and construction of the apparatus involved in carrying out chemical processes on a large scale, that it is almost impossible for a chemist, not possessing knowledge of such matters, to be in any way successful in a commercial or manufacturing point of view, however satisfactory the simple chemistry of his process may be. Too little attention has been paid by chemists in this country to the construction and arrangement of apparatus. There is room here for great improvement, and I hope that before long those interested in manufactures will see the necessity, which most undoubtedly exists, for providing such education. There are, of course, other reasons why chemical processes are not successful, but I believe that in many cases—indeed, in the majority of cases—the faulty construction of apparatus is the chief cause. There is still another point on which I would say a few words, although it is chiefly to express my regret at what I consider to be the too precipitate and premature study of certain branches of organic chemistry to the neglect of the wide field of inquiry still left unworked in reference to chemistry in its connection with manufacturing and industrial pursuits. The principal aim of most young chemists now-a-days seems to be to give birth to some new system of notation, some new and complicated scheme of nomenclature, or to discover a product or series of products which in most cases can afford but little assistance towards the progress of science, and which, as far as even the naming and describing of such products are concerned, are only puzzles to their discoverers, and sources of considerable perplexity to chemists and scientific men in general. To those who have any ambition to signalize themselves by important discoveries, prolific of benefit to their fellow-men, and who wish to hand down their names to future ages as successful investigators, I would say that there is still a wide field open for investigation in the domain of inorganic chemistry, and in the applications of chemistry to industrial pursuits. My opinion is that the verdict of posterity, in years yet to come, will award to men like Leblanc, the inventor of the great alkali process; to James Muspratt, who first carried out this process on a large scale, and to such an extent as to lay the foundation of a national industry; and to William Gossage, the indefatigable investigator and improver of many of the operations connected with the manufacture,—a rank, as public benefactors, as high, although in another class, as it will award to Newton, to Bacon, to Faraday, and to others, distinguished by their great discoveries and labours in more scientific paths.

"To return, however, to the question of refuse products, these may be classed under three heads,—1st, those that are gaseous in character; 2nd, those that are liquid; and, 3rd, those that are solid. Those of the first class, although they give least trouble to the manufacturer,—because with him it is simply a case of what the eye doth not see the heart doth not grieve for,—yet, as a rule, these emanations do more damage than those which are turned out in a solid or liquid condition. Those of the second class, which are liquid, are, as a rule, turned into the nearest available stream or river, and render it utterly impure for the remainder of its course, until it empties itself into the nearest estuary. Those of the third class, the solid refuse, are often the most cumbersome and troublesome of the lot; and I shall now offer for your consideration this evening one of the most important refuse products of chemical manufactures that can possibly be mentioned, namely, alkali or soda waste. In the working of the soda manufacture nearly the whole of the sulphur required to commence the process has been thrown away in the refuse, and much nuisance, annoyance, and loss, has been thus produced. Several attempts have been made to recover this sulphur, but without satisfactory result, until a very recent date."

The various processes that have from time to time been proposed for recovering the sulphur from alkali waste, were next mentioned, and special attention was directed to that of A. Kopp, described in the 'Chemical News' for 1866, and also that patented by Mr. William Gossage. With reference to the latter, the author said that he considered that the decompositions, etc., indicated in this process, may yet be made available for the profitable recovery of sulphur from soda waste.

The processes of Townsend and Walker, J. L. Jullion, A. Noble, and others, were also alluded to.

Mr. TATE next described the process lately invented by M. Ludwig Mond, which, he stated, was now working very successfully on a large scale in three or four of the most extensive alkali works in the kingdom. He had seen it in active operation at the works of Messrs. Hutchinson and Co., at Widnes, and considered that it would not only prove remunerative to the manufacturers, but would also do away with the great nuisance now caused by throwing away the ordinary soda waste. The process is exceedingly simple, requires very little labour, and a very inexpensive plant. About one-half of the sulphur contained in the waste is recovered at a cost which leaves to the manufacturer, at present prices of sulphur, a profit of from £3 to £4 per ton. There is also another advantage, and that is, that the waste, after removal of the recoverable sulphur, can actually be employed in making fresh black ash. Very good results have already been obtained, and by further experiment it is expected that these results may be improved.

The paper was illustrated by a number of plans, drawings, and specimens, kindly supplied to Mr. Tate by Mr. Henry Brunner, of Widnes, manager of Messrs Hutchinson and Co.'s alkali works, who has for some time superintended the sulphur-recovery process at those works.

Mr. KYNASTON said that M. Mond's process was most ingenious, and certainly did succeed so far as the recovery of the sulphur was concerned; but he feared that, in a pecuniary point of view, it would not recompense the manufacturer for the loss of the hydrochloric acid, which could be more profitably employed in making bleaching-powder.

The SECRETARY offered some remarks, and, after a vote of thanks to Mr. Tate for his interesting paper, the meeting closed.

THE NOTTINGHAM AND NOTTINGHAMSHIRE CHEMISTS' ASSOCIATION.

The Fourth ordinary Meeting of this Society was held at the Exchange Rooms, on Friday evening, May 14th; Mr. ATHERTON, the President, in the chair.

The following papers were read:—

"The Result of Examination of some Samples of Tincture of Opium," by Mr. MAYFIELD.

"Botany in Relation to Pharmacy," by Mr. RAYNER.

This was the last meeting of the Session.

ORIGINAL AND EXTRACTED ARTICLES.

ON THE FUNCTIONS OF NUCLEI WITH RESPECT TO GASEOUS, SALINE, AND VAPOROUS SOLUTIONS.*

BY CHARLES TOMLINSON, F.R.S., F.C.S., ETC.

As every one here present is engaged in conducting processes in chemistry and pharmacy, all will, I am sure, be interested in some new experiments connected with the solution of gases, crystallization, ebullition, and distillation which I shall have the honour of performing before you.

You know that when a bottle of soda water is emptied into a glass, there is not only an escape of gas from the surface of the liquid, but innumerable bubbles become attached to the inner surface of the glass. A crumb of bread thrown into the soda water produces a lively effervescence, and if we put into it the finger, a strip of paper, a rod of glass, of metal, or of wood, it immediately becomes covered with gas. In fact any solid acts as a *nucleus* in separating gas from solution; and I would define a nucleus as a body that has a stronger adhesion for the gas of a solution than for the water which holds the gas in solution.

Let us now take a glass that has been made chemically clean by being washed

* Substance of a lecture delivered at 17, Bloomsbury Square, on the 19th of May.

out with strong sulphuric acid or caustic alkali, and copious rinsing with clean water. If the soda water be poured into this, the results are very different. After the first effervescence is over, the glass looks as if it were full of pure distilled water: not a bubble of gas is to be seen adhering to the sides, and there is no appearance of gas anywhere about it. I plunge into the liquid a glass rod that has been made chemically clean, or *catharized*, as it may be called; there is no escape of gas, not a single bubble adheres to the glass rod. I put in clean iron filings,—there is no liberation of gas. I pour some iron filings into my hand and rub them about, and on putting these into the soda water there is a furious boiling effervescence.

Hence you see there is a marked distinction between a clean or catharized body, and an unclean body, or *nucleus*, as it may be called.

The action of nuclei may be similarly traced in the case of certain salts that form supersaturated solutions. For example, 100 parts of water at 212° F. will take up 357½ parts of potash alum; whereas at 32° the water will take up only 3·9 parts, and yet the solution saturated at 212° may be cooled down to 32°, without any separation of the salt, provided the vessel containing it be chemically clean, the solution clean, and means be taken to exclude the dust of the air. Such a solution is said to be supersaturated, because it holds more salt in solution than it can take up at the reduced temperature. In the case before us, a solution of alum saturated at 212° and cooled down to 32°, contains 90 times more salt in solution than it can take up at 32°. Here is a solution of alum saturated at 194°, and containing 53 times more salt than the water at 32° can take up. It is a perfectly clear and bright solution, and may be shaken with impunity. It remains liquid and supersaturated simply because there is no nucleus to start the act of crystallization. I take out the plug of cotton wool from the flask, and you see how beautifully the surface of the solution becomes covered with a crystalline crust, while well-shaped octahedra grow downwards until the whole mass is solid, and the flask quite warm with the heat developed by the change of state.

Here is a supersaturated solution of sodic sulphate in a narrow-necked flask. I take out the cotton wool and the solution does not crystallize. I touch the surface of the solution with a glass rod, and crystallization instantly sets in.

Here are similar solutions of sodic sulphate and sodic acetate, each containing a solid such as a bit of charcoal, of pumice stone, of meerschaum, of coke, etc. These bodies, which would act as nuclei in inducing crystallization if put into the cold solution, become inactive if boiled up with the solution, and allowed to cool down with it and in it. They are, in fact, chemically clean. I take the cotton wool out of these flasks, and some of the solutions crystallize on the instant, others after a short time, others again after some hours. It depends very much on the size of the opening whether a speck of dust enters the flask; for, of course, the wider the opening the more likely is it for the dust to find an entrance.

In the case of saline solutions a nucleus may be defined as a body that has a stronger attraction for the salt of a solution than for the liquid which holds it in solution.

In general, a body that has been exposed to the air, or handled, or wiped with a cloth that has been handled, is covered with an oily, fatty, or greasy film, to which the water of the solution adheres either not at all, or less strongly than does the salt of the solution, and hence such a body introduced into the solution acts as a nucleus. Make the body chemically clean, and the solution adheres to it as a whole; that is, there is the same amount of adhesion between the nucleus and the water of the solution, as there is between the nucleus and the salt of the solution, and hence there is no separation.

An extreme case of this kind of perfect adhesion on the part of chemically

clean surfaces and the solutions, may be seen in this flask. It contains a highly supersaturated solution of sodic sulphate resting on a considerable mass of the modified 7-atom salt. This being chemically clean, does not act as a nucleus to the rest of the solution. I can shake the flask violently, so as to break up and rattle about these crystals at the bottom, and the solution does not solidify. But now look at this:—I take out the cotton wool, and instantly lines of crystals closely packed together, diverge from some point on the surface, and the whole saline contents of the flask form one solid mass.

This differential kind of action which belongs to nuclei may also be exhibited with reference to liquids at or near the boiling-point. My definition of such a liquid is that it is a supersaturated solution of its own vapour. It is a solution of vapour constituted like the solution of carbonic acid in water, or of sodic sulphate or of alum in water.

Such being the case, a body introduced into a liquid at or near the boiling-point acts, or does not act, as a nucleus in separating vapour according as it is unclean or clean. If clean, the solution adheres to it perfectly and there is no separation of vapour; if unclean, the vapour adheres to the surface as strongly as before, but the liquid adheres less strongly or not at all, and hence there is a separation of vapour on the surface of the nucleus.

Now you are all acquainted with a very unpleasant phenomenon that often accompanies the processes of boiling and distillation: I mean the *bumping* of the vessel, or *jumping ebullition* (*soubresauts* in the language of French science). In such cases the liquid makes the interior of the vessel clean, and the solution of vapour adheres to it with great force; the temperature rises above the boiling-point until the liquid, not being able to dissolve any more vapour, a portion of the latter escapes with a burst along the line of least resistance or towards the opening of the vessel. This upward action is accompanied by an equal reaction in a contrary direction, which tends to force the retort or flask further into the ring of the retort stand, or down upon any other support, and it is the rebound from this that causes the *soubresaut*. Now for the purpose of preventing or mitigating this inconvenient and even dangerous action, it is the practice to introduce into the vessel certain angular or rough bodies, such as sand, powdered glass, bits of tobacco-pipe, platinum, copper, etc. Such bodies have been called "promoters of vaporization." How they act has not been explained, but it has often been noticed that they cease to act in liberating vapour after prolonged contact with the boiling liquid.

I need scarcely say that such bodies cease to act as nuclei in liberating vapour from solution as soon as they become chemically clean.

Now here is water boiling in a clean flask with some difficulty and a disposition towards bumping. I put into the flask a pinch of sand from the sand bath, and the boiling immediately becomes soft and regular, and there is no tendency whatever to bumping.

But suppose we make the sand chemically clean by heating it in contact with strong sulphuric acid, rinsing with water, washing with alkali, and again rinsing. Such sand, in very small quantity, in a chemically clean flask, containing clean distilled water, will increase the bumping to a remarkable extent. Here is such a flask standing over a spirit lamp. You see that it bounds up from the support with explosive force, and one wonders the flask is not shivered to pieces. The bits of glass, etc., put into a retort containing alcohol, ether, etc., soon behave in this way, for the liquid makes them, as well as the interior of the vessel, chemically clean, and in such case we multiply the adhesion surfaces, when what is wanted is an extension of the vapour-giving surfaces.

It is clearly wrong to employ as nuclei bodies that soon cease to act as such, supposing it were possible to find permanent nuclei. Porous bodies, such as charcoal, coke, pumice-stone, etc., perform this useful function. The same

force which enables a piece of box-wood charcoal, for example, to absorb 95 times its volume of ammoniacal gas, causes the charcoal, in the midst of a hot solution of vapour to absorb vapour, and under the continued action of heat to give it out again in a constant, never-ceasing flow.

Indeed, what is remarkable is the permanent action of these porous bodies. I have tried the same piece of charcoal or of coke, in boiling liquids, over and over again for weeks together, and never found the vapour-giving action to flag. I have boiled these porous bodies in strong acids, and washed them in alkalies, and made them in all respects chemically clean, without at all interfering with their vapour-separating action in boiling liquids. They do not act as nuclei in separating salt from solution, if boiled up with it and allowed to cool in it; their peculiar function is to separate vapour from liquids at or near the boiling-point, and this they do by their capillarity. I have in this flask a bundle of glass capillary tubes, united like a faggot by means of a thread in the middle. This acts vigorously in separating vapour from the liquid at the boiling-point, and even after the lamp has been removed from under the flask the tubes continue for some time to discharge vapour from their ends.

Among the charcoals, the most efficient as a vapour nucleus is charcoal from cocoa-nut shell. This is very dense, and sinks below the surface of liquids denser than water, which is a great advantage.

It will, I think, be worth your while to come up after the lecture and watch closely this large flask of water containing some pieces of cocoa-nut-shell charcoal. The vapour passes off from each piece in perfect torrents, and there are these two remarkable advantages connected with the action, namely, bumping is entirely prevented, and the amount of the distillate is largely increased, in some cases as much as from 30 to 50 per cent. with the same amount of heat, in the same time as compared with the process without the use of the charcoal.

For example: methylated spirits of wine, boiling at 171° F., was distilled in a glass retort. The distillate collected in five minutes weighed 244 grains. Three or four fragments of charcoal, partly box-wood and partly cocoa-nut shell, weighing only 20 grains, were added to the retort. The distillate, in five minutes, was now 325 grains. The ratio of the results is 100 : 133·2; with 20 grains of pumice-stone the results were as 100 : 121·7; with 20 grains of meerschaum, as 100 : 112; and with 20 grains of coke, as 100 : 107·46.

But these results are understated; for the retort contained some porous specks of iron or charcoal, which get attached to most glass vessels during the process of manufacture, and which act as powerful nuclei in separating vapour from boiling liquids; indeed, were it not for these accidental impurities, many a chemical operation must fail from excessive bumping.

But as I promised to make this a short lecture, I must conclude. You see that there is a harmony of action in the behaviour of nuclei, with regard to gaseous, saline, and vaporous solutions, and from this action we get a clear view of the functions of nuclei; and also get rid of much speculation as to "molecular action" and the "mysterious action of the air," which some observers indulge in when treating of supersaturated solutions.

SALE OF POISONS.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—The practice adopted by chemists throughout the country, in registering and labelling poisons, is so widely different that I venture to offer a few suggestions on the subject. With regard to many preparations containing

poison (either in part i. or ii.), there is wide scope given by the recent decision of the Privy Council, on the case submitted to them, for the exercise of one's own judgment; so that uniformity could hardly be expected. I think it very desirable that we should have some general understanding amongst ourselves, as to the strength of preparations labelled "poison," in order to ensure as much as possible a similarity of practice in labelling them.

When customers obtain the same preparation at two shops, and find one labelled poison, and the other not, they naturally ask questions and are surprised, frequently thinking that some mistake has occurred. If a committee were appointed by the Society to consider the subject, and their proposed scheme published in the Journal and the 'Chemist and Druggist,' and recommended for general adoption, in my opinion it would be of great benefit. Not being compulsory, every one would be allowed to use his own discretion, and a careful discrimination would in many cases be much more effective than a fixed standard of strength authoritatively determined by the Privy Council. Every one, who has had practical experience on the subject, knows what a difficult matter it is to deal with,—the same preparation may be quite safe in one case and dangerous in others; no care or forethought of the vender, or signature in the poison book, can save from accidents caused by ignorance or carelessness on the part of the purchaser.

With respect to the question raised by Mr. Giles, as to whether we can legally refuse to supply poisons, when the form of filling up the entry is complied with, I would remark there are many cases in which it is prudent not to supply the full quantity asked for, and in some few instances to decline altogether to sell any.

Yours truly,

GEORGE BROWN.

Sandown, Isle of Wight.

NOTES AND ABSTRACTS IN CHEMISTRY AND PHARMACY.

BY C. H. WOOD, F.C.S.

On Emetine.

M. J. Lefort has published* some researches on the preparation, properties, and composition of emetine, the active principle of ipecacuanha.

This substance was first isolated by Pelletier and Magendie, and its properties afterwards more fully described by Pelletier and by Dumas. These chemists recommended the extraction of emetine to be effected by decomposing the compound of the base present in the ipecacuanha with calcined magnesia; the alcoholic solution, filtered through animal charcoal, deposits the alkaloid in the form of a white or grey substance, possessing all the vomitive property of the ipecacuanha. Several other processes have since been published, and, in 1853, M. Leprat applied to the isolation of this base the method indicated by M. Rabourdin, for the elimination of atropin and other alkaloids. He stated that by treating the alcoholic extract of ipecacuanha with chloroform and caustic potash, he had obtained from 100 grammes of powdered ipecacuanha, between 6 and 7 grammes of emetine, but he added that other samples of the drug had not furnished so large a quantity. M. Lefort gives a decided preference to this process of M. Leprat, although it occupies a long time in its performance, but he does not find it possible to obtain so large a proportion of pure alkaloid as that chemist indicates. From his own analysis he concludes that the ipecacuanhas of Brazil and New Granada do not contain more than 1 per cent. of pure emetine.

* 'Journal de Pharmacie,' April, 1869.

The following is the method of operating recommended by M. Lefort:—The powdered ipecacuanha is exhausted by percolation first with alcohol of 86° (sp. gr. 846), and then with alcohol of 56° per cent. (proof spirit); the united tinctures are distilled to recover the spirit, and the residue is evaporated by a water-bath to a syrupy consistence. This extract, which contains the emetine in combination with a peculiar organic acid, the ipecacuanhic acid, of which M. Willick has described the composition and properties, is poured into a well-stoppered bottle, and, for every 100 parts of powder which has been operated on, 2 parts of caustic potash dissolved in a little water are added together with a volume of chloroform nearly equal to that of the mixture. As the emetine is very soluble in potash, and as the alkaline solution rapidly absorbs oxygen from the air, the flask in which the reaction takes place should be always completely full. The mixture is strongly agitated, and then allowed to repose for several days; the chloroform which forms at first a species of emulsion by the agitation, slowly separates, and at last collects at the bottom of the vessel. It is then removed by a pipette, and replaced by a fresh quantity. The alkaline liquid may be considered to be exhausted when the chloroform comes away colourless, or almost so. The chloroform solutions are then mixed and distilled to recover the chloroform. The residue in the retort is deep brown, and is composed principally of emetine and a resinous matter, which, according to the experiments of Pelletier and Magendie, is not emetic. These two substances are separated from each other by treatment with a weak acid, which dissolves only the alkaloid. The solution is afterwards decomposed by the quantity of solution of ammonia exactly necessary to precipitate the base; any excess of the precipitant must be avoided, because emetine is slightly soluble in ammoniacal water. The emetine is thus deposited as a voluminous greyish powder, which may be collected on a filter, after being sufficiently washed by decantation. It still retains a minute quantity of resinous matter, which may be removed by digesting in ether. After this operation, the alkaloid remains in a state of great purity.

Dried at a temperature of 50° C., emetine, when perfectly purified, is a very light whitish powder without smell, and of a bitter taste. It fuses at a temperature of 70° C., and then forms a brown transparent mass. Exposed to the air it colours slightly brown, but it does not attract moisture and liquefy as stated by Pelletier and Magendie. At 15° C., distilled water dissolves $\frac{1}{1000}$th of its weight, and the resulting solution always possesses a yellowish tint and an alkaline reaction. Concentrated alcohol and chloroform dissolve it in all proportions, but it never crystallizes by the evaporation of these vehicles. Ether and the fatty oils dissolve it only in very small quantity. Caustic potash and soda freely dissolve it, and the solutions rapidly absorb oxygen from the air. Caustic ammonia does not dissolve it in such quantity, but nevertheless a notable quantity is taken up. Mixed with lime or magnesia and exposed to the air, it soon acquires a saffron-yellow tint. Hydrochloric, sulphuric, phosphoric, and acetic acids are easily saturated by emetine, producing uncrystallizable compounds very soluble in water. Nitric acid, on the contrary, possesses the remarkable property of forming with emetine a nitrate which is very slightly soluble in water. This compound is very voluminous at first, but gradually agglutinates to a tenacious brown uncrystallizable mass. 100 parts of water at 15° C. dissolve 1 part of this salt. This insoluble nitrate, which may be produced by double decomposition between the acetate, chloride, or sulphate of emetine and nitrate of potash, forms the most distinctive character of emetine. Tannin abundantly precipitates emetine from its aqueous, alcoholic, or saline solutions. Solutions of iodine furnish with this alkaloid compounds very little soluble in water. Bichloride of

mercury and iodohydrargyrate of potassium produce white compounds, insoluble in water and soluble in alcohol. The double salt formed with chloride of platinum is, on the contrary, soluble in water, and but very slightly so in alcohol. Emetine is also precipitated by molybdate of ammonia, and its salts are decomposed by basic acetate of lead.

The analysis of emetine by Pelletier and Dumas in 1823 led to the formula $C_{30}H_{22}NO_8$, but as this base does not form crystallizable salts, its saturating power was not determined. M. Lefort has therefore made several analyses of some of the salts of emetine for the purpose of ascertaining the true rational formula. Sulphuric and hydrochloric acids were carefully saturated with very pure emetine; the solutions, which were neutral to litmus paper, were evaporated and dried over lime and sulphuric acid. The resulting salts assumed the form of brownish friable transparent substances without any trace of crystalline form. The analyses of these compounds has led M. Lefort to double the numbers given above, and to write the formula of emetine as $C_{60}H_{44}N_2O_{16}$.

Ferric Iodate.

Professor Cameron, of Dublin, has recently introduced the iodate of the peroxide of iron into medicine. It is given in doses of from 2 to 5 grains, and is intended in certain cases to replace the more changeable iodide of iron.

It may be well to state, therefore, that ferric iodate is readily prepared by precipitating a solution of iodate of potash with perchloride of iron. If 5 fl. drs. of liq. ferri perchlor. fort. be diluted with 4 oz. of water, and added to a solution of 1 oz. of iodate of potash in 10 oz. of water, a white or almost white precipitate is thrown down, which may be collected, washed with a small quantity of water, and dried at a gentle heat. Excess of the iron salt must be avoided, as it is capable of redissolving the precipitate. Iodate of potash may be prepared for this purpose by the process given in the British Pharmacopœia for the test solution. Ferric iodate is stated to be soluble in 500 parts of water, and to have the composition, according to the analysis of Rammelsburg, of $Fe_2O_3 2I_2O_5 8H_2O$.

AMERICAN PHARMACEUTICAL ASSOCIATION.

SEVENTEENTH ANNUAL MEETING.

The following letter has been forwarded to the members of the American Pharmaceutical Association and many friends in this country. We publish it in the hope that it may induce exhibitors to forward contributions from this country :—

Dear Sir,—The exhibition of objects relating to Pharmacy and the collateral sciences has become a prominent and interesting feature of the Annual Meeting of this Association.

As an annual exponent of the progress of chemical and pharmaceutical industry, the Exhibition is replete with interest and instruction to the pharmacist; while to the manufacturer and wholesale dealer the occasion affords an excellent opportunity to make his name and his goods known to the trade.

The next meeting of the Association will be held in this city, commencing Tuesday, September 7, 1869. The importance of Chicago as a commercial centre, in connection with the fact that this will be the first meeting of the Association in this section of the country, it is confidently expected will attract a large attendance. Exhibitors therefore will find it to their interest to make a liberal display. A notice of the articles exhibited will be published in connection with the annual proceedings.

All engaged in the manufacture of pharmaceutical goods are cordially invited to send specimens of their productions. It is very desirable that there should be a more ample representation of crude drugs than has been the case at previous exhibitions. Importers and jobbers are earnestly requested to contribute of their abundance to this department. Living specimens of medicinal plants would add greatly to the attractiveness of the Exhibition; residents of the city and vicinity having such in their possession would confer a great favour on the Association by granting their use during its session, which will continue till Saturday, September 11th.

Articles for exhibition should be delivered, free of expense, to Henry W. Fuller, care of Fuller, Finch, and Fuller, 24, Market Street, Chicago, Ill., on or before September 1st, accompanied with invoice and bill of lading, with a description of the articles sent. Parties in New York, having small articles to exhibit, may send them to the New York office of said firm, No. 62, Cedar Street.

Articles sent for exhibition will be returned, sold, donated to the Chicago College of Pharmacy, or otherwise disposed of, as their owners may direct.

Should you wish to exhibit any articles, please notify the chairman of the local committee, without delay, stating what kind of goods you desire to send, the space required, and whether on floor, table, or wall.

Yours respectfully,

HENRY W. FULLER, *Local Secretary, A.P.A.*

JAMES W. MILL, *Chairman*,

PHILIP MILLEMAN,
GEO. M. HAMBRIGHT,
ALBERT E. EBERT,
THEO. SCHLOETZER,
THOS. WHITFIELD,
LOUIS STREHL,

Local Committee on Specimens.

Chicago, May 1st, 1869.

CLASSIFICATION.

DIVISION I.—Pharmaceutical drugs.

Subdivision 1.—Rare drugs and specimens possessing special interest, on account of their size, extra quality, or other property.

Subdivision 2.—Botanical specimens of medicinal plants, of indigenous or foreign growth, either living or in the dried sfate—Pressed herbs, essential oils, etc.

DIVISION II.—Chemical and pharmaceutical products, including dietetic and toilet articles.

DIVISION III.—Apparatus.

Subdivision 1.—Pharmaceutical apparatus and implements, as scales and weights, gas-heating apparatus, pharmaceutical stills, hydrometers, pill machines, improved dispensing appliances, etc.

Subdivision 2.—Chemical and scientific apparatus, as analytical balances, apparatus for organic and spectral analysis, microscopes, etc.

Subdivision 3.—Instruments for remedial and surgical purposes, as trusses, galvanic and electro-magnetic machines, dental and surgical instruments, mechanical appliances for the cure of deformities.

Subdivision 4.—Apparatus for manufacturing and dispensing soda and mineral waters.

Subdivision 5.—India-rubber goods, for pharmaceutical, chemical, or remedial purposes.

DIVISION IV.—Glassware adapted to the wants of the apothecary, including glass labels, and other ornamental work on glass.

DIVISION V.—Books on pharmacy, chemistry, and related subjects, botanical plates, portraits of eminent scientific men.

DIVISION VI.—Miscellaneous, including improvements in any branches connected with pharmacy, not enumerated above.

CORRESPONDENCE.

Persons having seceded from the Society may be restored to their former status on payment of arrears of subscription and the registration fee of the current year.

Those who were Associates before the 1st of July, 1842, are privileged (as Founders of the Society) to become Members, and by virtue of membership to be registered as *Pharmaceutical Chemists.*

Pil. Ipecac. c. Scilla.—To the Editors of the Pharmaceutical Journal,—Gentlemen,—Will you permit me, through your Journal, to call the attention of prescribers and dispensers to the fact, that the proportion of opium in pil. ipecac. c. scilla, given under the former article in the B.P., is not correct, but relates only to the sum of the ingredients before the addition of the excipient, as the following will show:—

Pulv. ipecac. co.	1·0 = 0·1 opii.
Ammoniacum	0·33
Scilla	0·33
Opium 0·1 in	1·66,

i.e. 1 in $16\frac{2}{3}$, or, as the Pharmacopœia has it, 1 in $16\frac{1}{2}$ nearly. Now add to this the *q. s.* theriaca, and it will, of course, reduce the opium below this proportion. In fact, I have three samples before me, prepared by different hands, containing—1 in $17\frac{3}{4}$, 1 in $18\frac{1}{4}$, and 1 in $19\frac{1}{2}$! Only a few days ago I was requested to send a patient $8\frac{1}{2}$ grains of the above pill; the prescriber remarking at the same time, "That will be rather more than $\frac{1}{2}$ grain of opium. I am desirous my patient should not have less." Here, it is evident, the prescriber was guided, in apportioning the dose of opium, by the Pharmacopœia, the incorrectness of which I have endeavoured to point out.—I remain, Gentlemen, your humble servant, A Modified Man.

"*Foreign Honours.*"—To the Editor of the Pharmaceutical Journal,—Sir,—The following fact is, I think, worthy of a place in the records of the Society. Mr. William Field has recently been admitted "Pharmacien" by the "École Supérieure de Pharmacie" of the University of Paris, having passed the last of four examinations on the 20th February of this year. He is, I believe, the first M.P.S. (dating from 1853) who has succeeded in these examinations, which, besides being in a foreign language, are both lengthy and difficult.* I enclose my card. I remain, Sir, your obedient servant, M. P. S.—*London, May 17th*, 1869.

Pharmaceutical Chemists and Members.—To the Editors of the Pharmaceutical Journal.—Gentlemen,—It has been a matter of great surprise to me to find in the Journals, both for April and May, a number of names of "Chemists and Druggists registered under the Pharmacy Act, 1868," elected members of the Pharmaceutical Society. In common with many of my fellow-members of the Society, the difference between the two titles I am quite unable to distinguish, so far as their individual influence on the public is concerned. The only distinction I can ascertain between each class of members is, that one is allowed to put over his establishment "Pharmaceutical Chemist," the other "Member of the Pharmaceutical Society." Now I ask (and I venture to predict I am expressing the sentiments of many of my brethren), will the former title inspire more confidence than the latter? Will a man be considered more competent to fulfil the onerous duties of a "Chemist" by being a "Pharmaceutical Chemist" than by being a "Member of the Pharmaceutical Society of Great Britain"? I think not. Who amongst the public knows, or cares to know, which of the two men has, by hard study and great cost of time and capital, passed the rigid and honourable examinations, and duly qualified himself for the title, and the one who has obtained it by paying two guineas to the Society without being examined? The two titles, then, are practically the same. I will quote my own instance. I entered business in 1867 (before the passing of the Act); I was then an Associate of the Society, and had a specie jar in my window with

* The *vivâ voce* examination is held in public, in a hall at times densely crowded.

the Pharmaceutical arms upon it. Our much-respected Secretary called, and informed me that I must either remove it, or make myself a member by passing the other necessary examination. I chose to adopt the latter plan, and, being in business, it cost me much anxiety, time, and expense; and now I have the satisfaction of seeing numbers of men elected for a mere subscription of two guineas. Except that I am proud of the honour of being a Pharmaceutical Chemist by examination, I should regret the outlay both of time and money. Apologizing for the length of my letter, I am, gentlemen, yours respectfully, JAMES BELL.—*Hastings, May*, 1869.

The Bill to Prevent the Adulteration of Drugs and Food.—To the Editors of the Pharmaceutical Journal.—Gentlemen,—Perhaps you will permit me a few words on the above question; I think no class of men would be wise if they willingly permitted themselves to be placed under tyrannical and oppressive laws, even if the main object aimed at was the public welfare. It is very doubtful if the chemists of the United Kingdom have not already placed themselves, or been placed in this respect by recent legislation in a false and dangerous position; already a chemist has been proceeded against, and actually fined, not for sending out a wrong article, not for the omission of the word *poison*, but simply because he had not added his own address,—and all this at the instigation of a regularly educated medical man. It is now proposed to apply the laws respecting the adulteration of food and ordinary drinks to our own trade, and *intensely* to increase the power of application. It may be that some additional legislation is earnestly required, and really desirable for all parties on this subject, but the Legislature ought to be made to feel that there is a very essential difference in the application of such laws to the trade in ordinary articles of food, and to that in medicine. In the former case, the articles are simple, their qualities are well understood, even by the most illiterate, any changes which they are liable to undergo spontaneously are at once recognized, any adulteration is easily detected; and as, for the most part, they are the productions of nature in an uncompounded state, the application of such laws is by no means difficult or unsatisfactory. In our case the matter is entirely and essentially different, our goods are intensely complicated, their very composition is not in all cases clearly understood, they are constantly undergoing chemical changes; and, in addition to this, we are often compelled to supply the public with different varieties of the same preparation, bearing the same name; sometimes to modify excessive price, or because one particular mode of preparation is what the purchaser has been accustomed to purchase, and which has always fully answered his special object, although its preparation may not be according to any particular standard, of which he cares just nothing. Again, even in many cases of simple medicines, it is a disputed point, what really constitutes an adulteration. I am far from thinking that the following clauses would be sufficient to protect us, but they may suggest others more effective. The law should not apply unless the article has been adulterated with the express view of deceiving the public, or increasing the profits of the adulterator. It should not apply to any article which is not sold expressly as answering to some particular standard. It should not apply to any man who is not clearly proved to be the adulterator, or to be cognizant of the adulteration. Any enactment going further than this would be clearly tyrannical, oppressive, and unjust, and ought to be resisted to the utmost by every section of our community. I am, Sir, yours truly, J. B.—*Birkenhead, May* 6, 1869.

Opium Lozenges.—Mr. T. Howard Hall, of Spitalfields, in reference to a paragraph in a letter which appeared in our last number on this subject, but evidently mistaking the purport of the letter, observes:—"On reference to the authorized Pharmacopœia, there is no reason that I can see, for calling opium lozenges other than as there named. Take the case of bismuth lozenges, B. P.; your correspondent would have us call them 'Compound Bismuth Lozenges,' perhaps, but until the proper authorities see the necessity of changing the name or composition of any article or formula of the Pharmacopœia, we must conform to its recognized authority." In reply to our correspondent's question, the Pharmacy Act does not provide that no preparation of the Pharmacopœia shall be made by a person who is not registered under the Act.

Uniformity of Prices.—The chemists of Colchester, guided by the example of their Manchester brethren, have unanimously adopted a uniform dispensing price list and private mark.—May 6, 1869.

A Novel Method of Catching Mice.—A correspondent, in reference to a paragraph on this subject in our last number, informs us that he tried the experiment on a cask of canary-seed which was infested with mice, and found *nine dead mice* as the result!

A. P. S. (Wakefield).—Bimeconate of morphia, for hypodermic injection, according to Squire, is prepared by evaporating the "solution of bimeconate of morphia" to one-twentieth of its volume.

J. S. S. (Marlow).—The method indicated of mixing the ingredients answers well.

W. J. D. (Portsea).—All the questions of our correspondent are replied to in the negative, with the exception of that referring to prescriptions, which require to be registered according to the Act; in such cases the name of the person for whom the medicine is intended must be entered in the book, as well as the formula.

W. B. C. (Lincoln).—Eligible to be elected as an Associate.

T. E. (Dublin).—Yes, but an acquaintance with the new system is expected.

"*A Registered Chemist.*"—Separation of the ingredients in the formula in question cannot be avoided.

J. R. (Aberavon) should apply by letter to the Secretary, 17, Bloomsbury Square, who will forward a copy of the rules of the Board of Examiners.

G. L. N. (Exeter).—The word "Poison" affixed to the article, together with the name and address of the seller, is all that is required in such cases.

W. B.—The subject has been fully considered, and it is found to be impracticable.

F. C. (Lowestoft).—Yes.

"*Ext. Carnis*" wishes for a formula for "Syrupus Ferri et Calc. Hypophosphitis."

"*Lucidus*" (Tamworth).—*Colours for show bottles*, see Vol. III. pp. 94, 143, 192, and Vol. X. p. 92.

"*A Student.*"—The Pharmaceutical Latin Grammar.

P. L. W. (Rye).—"Vermin Killers" are not included in the Act.

"*An Inquirer.*"—N. C. The Preliminary Examination will be required in all cases under the new regulations, which will come into operation in October.

G. S. (Brixton).—Veterinary surgeons are not prevented from using Methylated Spirit in their preparations. The licence is required for the sale of, not for keeping Methylated Spirit.

"*Granum*" (Manchester).—Gregory's Powder is made with light Magnesia, as directed in the British Pharmacopœia for Pulvis Rhei Compositus. Gregory's Powder is sometimes made with heavy Magnesia, and sold as a proprietary article.

J. G. (Fulham).—The formula referred to is correct.

Mr. J. Balmer, in reply to many inquiries, wishes to state that his Emplastrum Belladonnæ contains a third of its weight of the resinous extract of the root.

F. H. E. (Sandwich).—The seed forwarded is derived from *Curcas purgans*.

J. Y. (Leicester).—(1.) No. (2.) There is a slight difference in composition, arising from difference in mode of production. (3.) The sulphate of lime may be dissolved out with water and tested.

C. F. (Huddersfield).—(1.) The former. (2.) Yes, at one part of the process.

A. P. S. (Sudbury) describes the bursting of a bottle containing hypochloride of sulphur. The chloride of sulphur which the preparation contains is subject to decomposition in contact with air and moisture, acid vapours being formed, and the accident probably arose from this cause.

A. E. I.—(1.) With reference to the examinations, should apply to the Registrar. (2.) With reference to the formulæ, send the list and we will explain them.

The Secretary and Registrar desires to intimate that no anonymous communications, or letters signed with initials only, will be answered.

Instructions from Members and Associates respecting the transmission of the Journal before the 25th of the month, to Elias Bremridge, Secretary, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Messrs. Churchill, New Burlington Street. Other communications to the Editors, Bloomsbury Square.

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